ANNUAL PUBLICATIONS

2017

Graduate School of
Medical and Dental Sciences
Tokyo Medical and Dental University
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- Department of Liver Disease Control | 534
- Department of Cartilage Regeneration → Refer to Joint Surgery and Sports Medicine (page98〜103)
- Department of Advanced Therapeutics for GI Diseases | 538
- Department of Orthopaedic Research and Development
  → Refer to Orthopaedic and Spinal Surgery (page416〜421)
- Department of Sleep Modulatory Medicine | 542
- Department of Joint Reconstruction → Refer to Joint Surgery and Sports Medicine (page98〜103)

**Joint Research Departments**

- Department of Translational Oncology | 544
- Advanced Technology in Medicine → Refer to Orthopaedic and Spinal Surgery (page416〜421)
- Functional Joint Anatomy → Refer to Clinical Anatomy (page376〜379)

**Medical Hospital**

**Central Clinical Facilities**

- Clinical Laboratory | 546
- Radiology Center → Refer to Radiation Therapeutics and Oncology (page68〜69)
- Transfusion Medicine | 550
- General Medicine • Professional Development Center
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**Dental Hospital**

**Hospital Departments**

- Cleanroom | 560
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Oral Pathology

Professor
Tohru Ikeda

Junior Associate Professor
Kei Sakamoto

Assistant Professor
Kou Kayamori

Technical Staff
Miwako Hamagaki

Graduate Students
Sawangarun Wanlada
Yae Ohata
Akane Wada
Shoko Ishida
Maiko Tsuchiya
TEERAWONG CHANYANUCH

(1) Research

1) Pathology and biology associated with bone
2) Pathological and biological studies on oral cancers, odontogenic tumors and oral premalignant lesions
3) Pathological and biological studies on microenvironment associated with invasion and metastasis of cancers
4) Clinicopathological and diagnostic histopathological studies on oral and maxillofacial lesions

(2) Education

Lectures and microscope practice in the module “Pathology” to 3rd grade students. The Pathology module comprises two sections; General pathology and Oral pathology. Main objective of General pathology is to provide students knowledge on various diseases, which is essential to work in dental, medical and biological fields. Oral pathology provides detailed knowledge on oral diseases, which is indispensable for a dentist.

(3) Clinical Services & Other Works

Our staffs and graduate students participate in diagnostic pathology practice in the Dental Hospital, where nearly 3,000 specimens are annually submitted to laboratory investigation. Our staffs and graduate students also participate in autopsy in the Medical Hospital in cooperation with the staffs and graduate students at the Faculty of Medicine.
Oral Health Sciences

(4) Publications

[Original Articles]


3. Fujita, S., Ikeda, T.. The CCL2-CCR2 axis in lymph node metastasis from oral squamous cell carcinoma: an immunohistochemical study. 2017.04; 75; 742-749


17. Yae Ohata, Anna Tatsuzawa, Yoshio Ohyama, Ayako Ichikawa, Yumi Mochizuki, Sachiko Ishibashi, Yuri Itakura, Urara Sakurai, Kei Sakamoto, Tohru Ikeda, Masanobu Kitagawa, Kouhei Yamamoto. A distinctive subgroup of oral EBV+ B-cell neoplasm with polymorphous features is potentially identical to EBV+ mucocutaneous ulcer. Hum. Pathol.. 2017.11; 69; 129-139


[Conference Activities & Talks]


Bacterial Pathogenesis

Professor SUZUKI Toshihiko
Associate Professor
ASHIDA Hiroshi
Assistant Professor
SUZUKI Shiho
Graduate Student
OKANO Tokuju
Graduate Student
YAMAMURA Kiyonobu
Graduate Student
LEEWANANTHAWET Anongwee (Department of Periodontology)
Graduate Student
ABASS Adiza (Department of Molecular Virology)

( 1 ) Research
Research Subjects
1) Molecular mechanisms of infection by pathogenic bacteria
2) Mechanisms of activation and regulation of inflammasomes via Nod-like receptors and caspase activation
3) Study of virulent genes based on comparative genomics
4) Relationship between persistent bacterial infection and chronic inflammatory diseases such as adipose or diabetes

( 2 ) Lectures & Courses
Purpose of Education
The aim of our laboratory in the graduate course is to understand molecular mechanism of pathogen infection and host immune responses. Students also learn planning of research, experiments and methods for evaluating.

( 3 ) Publications
[Original Articles]


4. Noboru Nakasone, Naomi Higa, Claudia Toma, Yasunori Ogura, Toshihiko Suzuki, Tetsu Yamashiro. Epigallocatechin gallate inhibits the type III secretion system of Gram-negative enteropathogenic bacteria under model conditions. FEMS Microbiol. Lett.. 2017.07; 364(13);

[Books etc]

[Misc]

[Conference Activities & Talks]
2. Ayumi Saeki, Masahiro Sugiyama, Akira Hasebe, Toshihiko Suzuki, Ken-ichiro Shibata. Activation of IL-1beta production in macrophages by mycoplasmal lipoproteins. The 84th Hokkaido Chapter Meeting of Japanese Society for Bacteriology 2017.08.26 Sapporo
Molecular Immunology

Professor  
Miyuki Azuma

Associate Professor  
Shigenori Nagai

Assistant Professor  
Tatsukuni Ohno

Adjunct instructor  
Hiroshi Kiyono

Graduate Students (Doctor)  
Hirunwidchayarat Worawalun (~ Sept.)
Nadya Niken Adiba (~ Sept.)
Naoto Nishii (Oral and Maxillofacial Surgery)
Xia Yulong
Furusawa Emi (Pediatric Dentistry)
Katou Hiroshi (Maxillofacial Surgery)
Yang Yue
Kashima Yoshihisa (Oral and Maxillofacial Surgery) (Apr. ~)
Ao Xiang (Pulp Biology and Endodontics) (Apr. ~)
Wongtim Keeratika (Oct. ~)
Tachinami Hidetake (University of Toyama)

Research Student  
Jin Xin (~ Sept.)

(1) Research

Research Subjects
1) Mechanisms of immune responses in oral diseases
2) Studies on lymphocyte functional molecules
3) Immunotherapy by molecular targeting

(2) Lectures & Courses

Purpose of Education
Main objective of Molecular Immunology in the graduate course is to understand and study how the immune system works for biological defense. Students also learn immunopathology and immunophysiology of systemic and organ-specific immune diseases and how the immune diseases control and regulate.

(3) Publications

[Original Articles]
inflammation. Mucosal Immunol. 2017.05; 10(3); 650-660


Advanced Biomaterials

Professor UO Motohiro
Assistant Professor WADA Takahiro
Graduate Student CHAIAMORNSUP Patcharamun
Graduate Student Kang Donghoon (Pulp Biology and Endodontics)
Graduate Student KOMIYA Ruri (Oral and Maxillofacial Surgery)
Graduate Student KOYAMA Akihiro (Orthodontic Science)
Graduate Student KINJO Rio (Sports Medicine and Dentistry)
Graduate Student Serif Adel (Pulp Biology and Endodontics)

(1) Research

1. Analysis of Dental and biomedical materials and biological tissue using the synchrotron radiation. Research is aimed to apply the new analysis method using synchrotron radiation for the estimation of various properties of the dental and biomedical materials.

2. Development of the functional dental and biomedical materials using glass and ceramics. Research is aimed to develop and evaluate the new glass and ceramics based materials as the dental and biomedical materials, e.g. composite resins, glass ionomer cements, dental porcelains and zirconia ceramics.

(2) Education

1. Lecture of unit “Biomaterials and Dental Materials” A series of lectures on the “science on biomaterials”, “properties of dental and biomedical materials”, “application of dental materials” will be taught through the lecture and practice.

2. Lecture of unit “Advanced Biomaterials” (graduate school) Evaluation methods of various dental and biomedical materials will be taught.

(3) Publications

[Original Articles]


5. Qiuyi Yuan, Satoru Takakusagi, Yuki Wakisaka, Yohei Uemura, Takahiro Wada, Hiroko Ariga, Kiyotaka Asakura. Polarization-dependent Total Reflected Fluorescence X-ray Absorption Fine Structure (PTRF-XAFS) Studies on the Structure of a Pt Monolayer on Au(111) Prepared by the Surface-limited Redox Replacement Reaction Chemistry Letters. 2017.06; 46(8); 1250-1253


10. Maekawa m, Koyama A, Ozaki S, Shima Y, Kanno Z, Doi H, Hanawa T, Wada T, Uo M, Ono T. Comparison of 3-point bending property of rectangular low-stress hysterisis Ni-Ti orthodontic wires with different cross-sectional dimensions 2017.11; 36(6); 470-477

11. Shirako Takahiro, Churei Hiroshi, Wada Takahiro, Uo Motohiro, Ueno Toshiaki. Establishment of experimental models to evaluate the effectiveness of dental trauma splints DENTAL MATERIALS JOURNAL. 2017.12; 36(6); 731-739

[Misc]

1. Motohiro Uo. Glasses for Dental Materials 2017.11; 24; 410-414

[Conference Activities & Talks]

1. Inokoshi M, Shimizu H, Nozaki K, Takagaki T, Zhang, F, Vlengels J, Van Meerbeek B, Uo M, Minakuchi S. Crystallographic analysis of alumina sandblasted highly translucent dental zirconia. 95th General Session and Exhibition of the IADR 2017.03 San Francisco

2. Sai Khan Lyann, Tomohiro Takagaki, Toru Nikaido, Takahiro Wada, Motohiro Uo, Masaomi Ikeda, Junji Tagami. Adsorption behavior of phosphoric functional monomers to 3Y-TZP surface. IADR/AADR/CDR GENERAL SESSION & EXHIBITION 2017.03.02 San Francisco, California, USA

3. Yuki Wakisaka, Hiromitsu Uehara, Daiki Kido, Tadashi Ohba, Qiuyi Yuan, Shigo Mukai, Yuya Iwasaki, Satoru Takakusagi, Yohei Uemura, Toshihiko Yokoyama, Takahiro Wada, Motohiro Uo, Oki Sekizawa, Tomoya Uruga, Yasuhiro Iwasawa, Kiyotaka Asakura. Back-illuminated XAFS measurement with low concentration by means of BCLA. 2017.03.14


5. Yuki Wakisaka, Hiromitsu Uehara, Daiki Kido, Tadashi Ohba, Qiuyi Yuan, Shingo Mukai, Yuya Iwasaki, Satoru Takakusagi, Yohei Uemura, Toshihiko Yokoyama, Takahiro Wada, Motohiro Uo, Oki Sekizawa, Tomoya Uruga, Yasuhiro Iwasawa, Kiyotaka Asakura. In-situ XAFS measurement of low concentration Pt/HOPG by means of bent crystal Laue analyzer. 2017 International Workshop on Electrified Interfaces for Energy Conversions (EIC2017) 2017.05.19 Kanagawa, Japan


8. Kang D, Wada T, Uo M, Okiji T. Evaluation of mechanical and rheological properties of the clay added calcium silicate cement. The 146th Meeting of The Japanese Society of Conservative Dentistry 2017.06.08 Link Station Hall Aomori

9. Takahiro Wada, Churei Hiroshi, Toshiaki Ueno, Motohiro Uo. Shock-absorbing property of face guard made by a carbon-fiber reinforced thermoplastic. 2017.06.18

10. Polarization-dependent total reflection in-situ XAFS of polycrystalline Pt thin film surface. 2017.08.17


15. Effect of surface treatment agent on lamination bonding strength of mouth guard sheet materials. 2017.10.14


18. Kang D, Wada T, Uo M, Okiji T. The study for the improvement of compressive strength and operability of the synthesized calcium silicate cement. The 70th Meeting of The Japanese Society for Dental Materials and Devices 2017.10.15 Niigata

19. Yuan Qiuyi, Takakusagi Satoru, Wakisaka Yuki, Uemura Yohei, Wada Takahiro, Ariga Hiroko, Kiyotaka Asakura. An Investigation into the Stoichiometry of Galvanic Displacement Reaction Using XAFS. The 8th International Symposium on Surface Science (ISSS-8) 2017.10.22 Tsukuba, Ibaraki, Japan


Diagnostic Oral Pathology

(1) Outline

Diagnostic oral pathology is a branch of pathology which studies human pathology, and aims at practice and development of the oral science as clinical medicine. The main object is to bring up graduate students and post-doctoral residents for pathology specialist to the great oral pathologists through the lecture of surgical pathology and pathology diagnosis and research instruction of oral and general diseases for the time being.

(2) Research

Research Subjects
1) Surgical pathology of oral cancer.
2) New diagnostic approach and reconstruction of oral diseases.

(3) Clinical Services & Other Works

Diagnostic oral pathology is playing three roles, pathological diagnosis (3,400 cases in a year), clinical laboratory (215,000 tests in a year) which consist of hematological, biochemical, bacteriological, physiological and pathological parts, and blood transfusion (100 cases in a year) in the dental hospital.
Outline

Main objective of this branch is to provide opportunities to study radiation oncology for oral cancer and translational research for radiosensitization of oral cancer.

Research

1) Visualization of tumor radioresponse by molecular imaging
2) Mechanism of DNA damage response
3) Radioresistant signal transduction pathways
4) Radiotherapy for oral cancer

Education

Oral Radiation Oncology is a branch of radiation oncology dealing with basic radiobiology, translational research, and radiotherapy for oral cancer. Main objective of this branch in the graduate course is to provide opportunities to study biological strategies for radiosensitization, development of radiosensitizers, molecular mechanism of tumor radioresistance, the state of the art technology of radiotherapy, and basis of individualized radiotherapy depending on each student’s research projects.

Lectures & Courses

The educational policy is to cultivate researchers to be able to extract problems and to work out solutions to them.

Clinical Services & Other Works

Oral Radiation Oncology clinic provides radiotherapeutic treatment for head and neck cancer patients, especially brachytherapy for oral cancer, in cooperation with Diagnostic and Therapeutic Radiology clinic in the Medical Hospital.
Clinical Performances

We are performing brachytherapy for oral cancer, which is now the only treatment modality without surgical excision, as a center institution in Japan.

Publications

[Original Articles]


[Conference Activities & Talks]

1. Atsushi KAIDA. Effects of tumor microenvironments on cell cycle kinetics following X-irradiation. TMDU Intractable Disease (Cancer) Unit Overseas training Seminar Young Researchers (Soo chow University) 2017.02.22 Soo chow, China


4. Masahiko Miura. Redistribution revisited by visualizing cell cycle. 1st International Symposium on Radiation Therapeutics and Biology 2017.11.01 Shenzhen, China

5. Nisha Gowri Manila, Atsushi Kaida, Masahiko Miura. Insulin-like growth factor I receptor (IGF-IR) regulates radiation-induced G2/M checkpoint by controlling Chk1 localization in HeLa cells. TMDU Intractable Disease(Cancer) Unit Workshops for Young Researchers 2017.11.06 Tokyo

6. Atsushi Kaida, Yusuke Onozato, Masahiko Miura. Determining radiosensitivity of quiescent and proliferating tumor cells irradiated under different tumor microenvironments. 33th International Symposium of Radiation Biology Center, Kyoto University 2017.12.05 Kyoto
Oral and Maxillofacial Surgery

Professor Hiroyuki HARADA
Associate Professor Eriko MARUKAWA
Junior Associate Professor Fumihiro TSUSHIMA
Assistant Professor Hiroaki SHIMAMOTO, Hirofumi TOMIOKA,
Hideaki HIRAI, Kae TANAKA, Takeshi KUROSHIMA

Graduate Student
Naoto NISHII, Sirimanas JIARANUCHART, Shuhei FUKUDA,
Ruri KOMIYA, Yoshihisa KASHIMA, Hitomi NOJIMA, Misaki YOKOKAWA,
Naoya KINOSHITA, Yuuki TAKAGAWA, Aoi KANEKO, Yuma ISHIDA,
Shintaro SAKAKITANI, Yoshimitsu SATO, Misako TANAKA, Hiroaki SHIMONO
Kaho Takada, Shohei YANAGISAWA, Takuya KOMIYAMA, Cuong TRAN MINH

(1) Outline

Purpose of Education
The program is designed for acquiring the broad knowledge and basic skills of oral and maxillofacial surgery, mainly concerning the diagnostic procedure, treatment technique and the perioperative patient care. Also throughout the professional education, we promote the system in which each graduate student can select his or her special field in the full scope of oral and maxillofacial surgery in the future.

Research Subjects
1) Development of multidisciplinary treatment of oral cancer.
2) Clinical study on sentinel node navigation surgery for oral cancer.
3) Study on molecular markers for lymph node metastasis of oral cancer.
4) Clinical study on maxillomandibular skeletal and dental changes after orthognatic surgery.
5) Study on neurosensory disturbances using the heat flux technique.
6) Multidisciplinary treatment of temporomandibular disorders.
7) Clinical and experimental studies on bone regeneration using $\beta$-TCP and/or platelet rich plasma.
8) Development of multidisciplinary treatment of oral mucosal diseases.

Clinical Services
The Oral and Maxillofacial Surgery Clinic examines yearly more than 6,200 new patients with various diseases arising in oral and maxillofacial regions. The clinic has diplomats of the Japanese Society of Oral and Maxillofacial Surgeons and accepts many referrals from dentists and medical doctors. We provide a full range of services including extractions, removal of wisdom teeth and management of facial trauma, jawbone defect, facial deformity, temporomandibular joint disease, cleft lip and palate, oral mucosal disease, and benign and malignant tumors. The special outpatient clinics are organized by the specialists to offer the best service, especially for patients with malignant tumor, temporomandibular joint disease, cleft lip and palate, facial deformity and oral mucosal disease which need high degree of specialty and long term follow up. We also prepare some groups for inpatients with an emphasis on specialties, to provide the recent and advanced treatment.
(2) Publications

[Original Articles]


5. Lam PD, Kuribayashi A, Sakamoto J, Nakamura S, Harada H, Kurabayashi T. Imaging findings of childhood B-cell lymphoblastic lymphoma in the mental region: a case report. Dentomaxillofacial Radiology. 2017.03; 46(3); 20160313

6. Nguyen CT, Okamura T, Morita K, Yamaguchi S, Harada H, Miki Y, Izumo T, Kayamori K, Yamaguchi A, Sakamoto K. LAMC2 is a predictive marker for the malignant progression of leukoplakia Journal of Oral Pathology and Medicine. 2017.03; 46(3); 223-231


18. Takahara N, Nakagawa S, Sumikura K, Kabasawa Y, Sakamoto I, Harada H. Association of TMJ pain according to magnetic resonance imaging findings in TMD patients J Oral Maxillofac Surg. 2017.09; 75(9); 1848-1855


29. Takemoto T, Kabasawa Y, Higuchi Y, Tabata Y, Aoki K, Tamura Y, Harada H. Combination of the RANKL-binding peptide W9 and bFGF induces ectopic bone regeneration in the rat calvarial defect mode Dental, Oral and Craniofacial Research. 2017.12; 4(3); 2-7

[Conference Activities & Talks]


Oral Health Sciences

Oral and Maxillofacial Radiology

Professor: Tohru KURABAYASHI
Associate Professor: Hiroshi WATANABE
Junior Associate Professor: Naoto OHBAYASHI, Norio YOSHINO
Assistant Professor: Akemi TETSUMURA, Shin NAKAMURA, Ami KURIBAYASHI, Junichiro SAKAMOTO
Hospital Staff: Yoshikazu NOMURA, Mamiko FUJIKURA
Graduate Student: Shinya KOTAKI, Ngamsom SUPAK, Hiroko ISHII, Noriko SUZUKI, Chutamas DEEPHO, Tran Thi Xuan LAN, Sakurako ASAI, Wamasing PEERAPONG
Secretary: Izumi MOTOHASHI

(1) Research

1) Diagnosis of maxillofacial diseases by CT, MRI and PET imaging
2) Advantages of cone-beam CT for clinical dentistry
3) Development of high resolution MRI technology.
4) Novel MRI techniques for TMJ disorders.
5) Factors determining radioresistance of oral and maxillofacial cancers.

(2) Lectures & Courses

Oral and maxillofacial radiology is a branch of dental science which deals with the effective application of radiation energy to the diagnosis and treatment of oral and maxillofacial diseases. Main objective of oral and maxillofacial radiology in the graduate course is to provide students opportunity to study advanced imaging modalities including digital imaging, cone-beam CT, multi-detector row CT and MRI, and also to study image processing and image analysis technology. Students are also taught on basic radiation oncology and its related laboratory technology depending on their research project.

(3) Clinical Services & Other Works

Oral and maxillofacial radiology clinic provides a full spectrum of imaging examinations and diagnosis, including CT and MRI. Non-invasive, interventional radiology for patients with salivary gland stone is also performed in the clinic.

(4) Publications

[Original Articles]


3. Watanabe H, Kuribayashi A, Sumi Y, Kurabayashi T. Resolution characteristics of optical coherence tomography for dental use. Dentomaxillofacial Radiology. 2017.03; 46(3); 20160358

4. Deepho C, Watanabe H, Kotaki S, Sakamoto J, Sumi Y, Kurabayashi T. Utility of fusion volumetric images from computed tomography and magnetic resonance imaging for localizing the mandibular canal. Dentomaxillofacial Radiology. 2017.03; 46(3); 20160383

5. Lam PD, Kuribayashi A, Sakamoto J, Nakamura S, Harada H, Kurabayashi T. Imaging findings of childhood B-cell lymphoblastic lymphoma in the mental region: a case report. Dentomaxillofacial Radiology. 2017.03; 46(3); 20160313


7. Toriihara A, Nakadate M, Nakamura S, Kubota K, Tateishi U. Seventy FDG-PET/CT cases in which nuclear medicine physicians suspected lymphoma: how reliable are we? Asia Ocean Journal Nuclear Medicine Biology. 2017.05; 5(2); 95-103


[Conference Activities & Talks]


7. Reiko Hoshi, Akemi Tetsumura, Satoshi Yamaguti. Relationship between hypesthesia of the inferior alveolar nerve after mandibular cystectomy and preoperative imaging findings on panoramic X-ray films and CT scan. The 62nd Congress of the Japanese Society of Oral and Maxillofacial Surgeon 2017.10.20 Kyoto


[Awards & Honors]

1. Hiroshi Watanabe. Excellence in Research 2016, Tokyo Medical and Dental University, Faculty of Dentistry, 2017.02

2. Deepho Chutamas. The first prize in presentation., The Stomatological Society, Japan., 2017.11
Anesthesiology and Clinical Physiology

(1) Outline

For safety and comfortable dentistry for both patients and dentists, educations, researches and clinical practices are performed in the department. Education includes basics and practises of local and general anesthesia, sedation, monitoring (monitored anesthesia care, MAC) in addition to cardio-pulmonary resuscitation, or, basic life support during dental treatment. Our researches are consisted of basic and clinical trials for the purposes. Many cases give us many chances to keep the patients safe and comfortable during local and general anesthesia. Local groups, such as dental associations, are welcomed to promote safe and comfortable dental treatments.
(2) Research

1) Non-invasive drug delivery system
2) New methods for local anesthesia in dentistry
3) Neuropathic pain in oral and maxillofacial regions
4) Diffuse noxious inhibitory control or controlled pain modulation
5) Sedation for dentistry

(3) Education

Anesthesia and anesthesiology for dentistry, which are not only local anesthesia but also general anesthesia are given to both under and postgraduate students. Lectures and trainings are consisted of local and general anesthesia, sedation and cardio-pulmonary-resuscitation (CPR), or, basic life support (BLS). For local anesthesia, the students learn mechanism of local anesthesia, local anesthetics, techniques and local and systemic complications due to local anesthesia. Physiology, biochemistry and pharmacology are also provided for general anesthesia which includes possible mechanism of general anesthesia, anesthetics, muscle relaxants and what are used for general anesthesia. They also acquire the techniques of topical, infiltration and conductions anesthesia, nitrous oxide inhalation sedation and basic life support.

(4) Lectures & Courses

Anesthesia and anesthesiology for dentistry, which are not only local anesthesia but also general anesthesia are given to both under and postgraduate students. Lectures and trainings are consisted of local and general anesthesia, sedation and cardio-pulmonary-resuscitation (CPR), or, basic life support (BLS). For local anesthesia, the students learn mechanism of local anesthesia, local anesthetics, techniques and local and systemic complications due to local anesthesia. Physiology, biochemistry and pharmacology are also provided for general anesthesia which includes possible mechanism of general anesthesia, anesthetics, muscle relaxants and what are used for general anesthesia. They also acquire the techniques of topical, infiltration and conductions anesthesia, nitrous oxide inhalation sedation and basic life support.

(5) Clinical Services & Other Works

Safe medical and perioperative managements are given to patients of our ambulatory anesthesia service which has more than 2,000 cases per year and the central operation rooms which has 750 cases per year. Some difficult cases are referred to our hospital because of many clinical experiences. Several cases that need emergency care are also supported by our department. ER members are sometimes called in the medical hospital. Local groups like dental associations often ask us to hold some lectures, trainings, workshops for safe dental treatment. These proposals are welcomed by our staffs. When intravenous sedation cases are introduced, some responsible staff is sent to their own clinic.

(6) Clinical Performances

Any patient is welcomed, especially patients of oral surgery and implant operation who need special care using general anesthesia and sedation. Referred patients from open practitioners are also accepted for safe and comfortable dental treatment.

(7) Publications

[Original Articles]


Undergoing a Sagittal Split Ramus Osteotomy (SSRO). Journal of Japan Dental Society Anesthesiology. 2017.04; 45(2); 214-216


[Conference Activities & Talks]

1. Haruhisa Fukayama. Tips for local anesthesia in dentistry. 36th Myanmar Dental Conference & 167th FDI-MDA joint Educational Meeting 2017.01.20 Yangon, Myanmar

2. A case report of the systemic management by clear sight system © and transthoracic echocardiogram during dental treatment in a patient with dilated cardiomyopathy. 2017.03.03


5. Yukiko Baba, Hisa Okumura, Junko Kobayashi, Haruhisa Fukayama. A case in which ventilation failure is considered to be caused by bronchospasm immediately after intubation. 2017.06.24

6. Ryo Wakita. The effect on cardiac function of adrenaline in local anesthesia. 8th Mandalay Dental Conference 2017.07.23 Mandalay


8. The survey on dental-treatments under intravenous sedation in the clinic for patients with disabilities at the dental association. 2017.10.28

9. Dental treatment in a patient with hypertrophic obstructive cardiomyopathy. 2017.10.28

10. Stressords due to denntal treatmennt caused a high fever in a patient with intellectual developmental disorder:a case report. 2017.10.28
Orofacial Pain Management

Professor Masahiko SHIMADA
Junior Associate Professor Akira NISHIYAMA
Assistant Professor Yoko YAMAZAKI
Hospital Staff Hiroko KIMURA, Ryouko KURUSU, Hiroko IMURA, Masako TOBE, Hiroyuki ISHIYAMA, Maya SAKAMOTO, Ryoko KURISU
Graduate Student Akitoshi HOSODA, Kaori TUKAGOSHI, Rena NAKAYAMA, Nguyen Ho QUYNH ANH, Ngan Nguyen, Liang Shanshan, KAY THWE YE MIN SOE

(1) Outline

Main research subjects of orofacial pain management is to establish the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement, motor paralysis and temporomandibular disorders, in particular, is to elucidate the mechanism of pain, neuropathic pain, temporomandibular disorders.

(2) Research

Main research subjects of orofacial pain management is to establish the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement, motor paralysis and temporomandibular disorders, in particular, is to elucidate the mechanism of pain, neuropathic pain, temporomandibular disorders.

1) New Treatment methods for neuropathic pain
2) Analyses of abnormal orofacial pain
3) Study on Biological Response to Dental Interventions
4) Analyses and new treatment of dysgeusia
5) Development of multidimensional evaluation system for etiological factors of TMD
6) Influence of patients’ psychosomatic factors for TMD
7) Sleep bruxism: its etiology, influence and treatment
8) Effectiveness of physiological therapy for TMD
9) Mechanisms of occlusal discomfort

(3) Education

Purpose of education for students and residents in this course is to provide an opportunity to learn basic knowledge on diagnostic and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement, motor paralysis and temporomandibular disorders in the orofacial area. In special course for graduate students, main objective of orofacial pain management is to learn the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement, motor paralysis and temporomandibular disorders in the orofacial area, in particular, mechanism of pain, neuropathic pain, temporomandibular disorders, and we instruct statistical techniques especially with the multivariate analysis by using clinical data acquired from patients with temporomandibular disorders (TMD).
**Clinical Services & Other Works**

Orofacial Pain Clinic is concerned with the pain, abnormal sensation, sensory paralysis, abnormal movement, and motor paralysis in the orofacial area and management of orofacial pain clinic is pharmacotherapy, nerve block, stimulation of the peripheral nerves including acupuncture and psychotherapies. Temporomandibular joint clinic provides diagnosis and treatment for diseases and disfunctions of temporomandibular joint and masticatory muscles. We also provide the treatments for the nocturnal bruxism and the occlusal discomfort.

**Clinical Performances**

Orofacial Pain Clinic is concerned with the pain, abnormal sensation, sensory paralysis, abnormal movement, and motor paralysis in the orofacial area and management of orofacial pain clinic is pharmacotherapy, nerve block, stimulation of the peripheral nerves including acupuncture and psychotherapies. Temporomandibular joint clinic provides diagnosis and treatment for diseases and disfunctions of temporomandibular joint and masticatory muscles. We also provide the treatments for the nocturnal bruxism and the occlusal discomfort.

**Publications**

**[Original Articles]**

1. Yoko Yamazaki, Maya Sakamoto, Hiroko Imura, Masahiko Shimada. Pre-Trigeminal Neuralgia Similar to Atypical Odontalgia: A Case Report Journal of Pain & Relief. 2017.05; 63(3); 291
4. Rena Nakayama, Akira Nishiyama and Masahiko Shimada. Creating a Quality of Life Index for Patients with Temporomandibular Disorders Int J Dent Oral Health . 2017.09; 3(5);

**[Books etc]**


**[Conference Activities & Talks]**

2. Suzuki K, Kokai S, Uesugi S, Nishiyama A, Ono T. Evaluation of the laterality of the tissue oxygen saturation of masticatory muscles in subjects with facial asymmetry. The 93rd congress of the European Orthodontic Society 2017.06.05 Montreux, Switzerland

Pediatric Dentistry

Associate Professor
Michiyo MIYASHIN

Assistant Professor
Yoshiaki HASHIMOTO, Mizuho MOTEGI,
Satoko KAKINO, Tomoki UEHARA

Clinical Professor
Keiichi TAKEI

Adjunct Lecturer
Mitsuko INOUE, Hitoyata SHIMOKAWA, Masayo ONO
Hiroaki NAGAI, Nobutaka ISOGAWA,
Asuri jayawardeina, Naoko UEHARA,
Makiko TAKASHI, Natsumi TSUCHIHASHI

Hospital staff
Atsushi OISHI, Kanae WADA, Taki KEKIYA,
Kuniomi NAKAMURA(Apr. ~), Kenichi MIURA(Apr. ~)

Graduate Student
Kuniomi NAKAMURA(~ Mar.), GANBOLD Khongorzul(~ Sep.),
Erika KUBOTA, IJBARA Manhal M.A.,
ZUMULAITI Shaokelati, WIT Yee Wint, Satomi FURUSAWA,
Shigeki NAGAHIRO, Rika KODAMA(Apr. ~),
Manami TAKENOSHITA(Apr. ~)
Amrita Widyagarini Subagyo(Oct. ~)

Research Student
Chika INOHARA, Ayano INOUE(Apr. ~),
Yuko SEKI(Apr. ~), Yui SEKIDO(Apr. ~),
Kenichi MIURA(~ Mar.)
fellowship
GANBOLD Khongorzul(Oct. ~),

Enrolled dentist
Yui SEKIDO(~ Mar.), Mana KATAOKA(~ Mar.)

(1) Outline
The Department of Pediatric Dentistry was founded in 1955, as the first in Japan. Pediatric dentistry is a subject of clinical dentistry that deal with education and research of not only developmental oral health sciences but also
prevention and treatment methods of the diseases which disturb oro-facial growth and development of children.

(2) Research

Research Subjects
1) Physiological and biological studies on the stomatognathic function of children
2) Studies on the development and developmental disturbance of the teeth
3) Studies on the growth and development of the maxillofacial cranium and the dentition
4) Development of new Endodontics and Traumatology for deciduous and immature permanent teeth
5) Basic research on clinical pediatric dentistry

(3) Education

Lecture subjects
Pediatric dentistry, Oral pediatrics

(4) Lectures & Courses

The main objective of pediatric dentistry in this graduate course is to provide students an opportunity to study the theory and the method for the guidance of the oro-facial growth and development and for the diagnosis, prevention and treatment of diseases and malfunctions which disturb the oro-facial growth and development during the period of childhood.

Oral pediatrics is a subject of clinical dentistry that deal with education and research of not only maintenance and promotion of the oral health for growing children but also prevention and treatment methods of diseases and malfunctions which disturb oral health of growing children. The main objective of oral pediatrics in this graduate course is to provide students an opportunity to understand that a child is a living body with mental, physical, and physiological characteristics which are different from those of adults and to study the pathogenesis, prevention, and treatment of the particular oral diseases in childhood. Students are also taught the theory and the method of ongoing health care that is necessary for maintaining and promoting oral health from infant to adult. In addition, they are taught the clinical significance and importance of the behavioral management of child patients and the necessity and importance of understanding and cooperation of the parents to it.

(5) Clinical Services & Other Works

The pediatric dentistry clinic in the department of oro-facial development and function provides the comprehensive dental treatment for a child while growing.

(6) Clinical Performances

The examination, diagnosis, and treatment of the oral diseases and the oral abnormalities are performed in the clinic. In addition, health guidance, preventive measures, and the long-term oral health management by the periodical checking system are carried out, in order to keep and promote oral health from infant to adult.

(7) Publications

[Original Articles]


[Books etc]

[Conference Activities & Talks]

2. Uehara T, Nagahiro S, Uehara M, Kubota E, Furusawa E, Miyashin M. Findings from clinical reports of pulpotomies in primary teeth-a literature review. 2017.05.25 Kitakyusyu


5. Iwashita T, Suzuki T, Ichinose K, Akiyama K, Sekiya T, Miyashin M, Takei K. Questionnaire of feeding behavior of children at nursery school in Yamanashi (4)Qualitative Research with SCAT. The 32nd Japanese Scociety of Pediatric Dentistry, Kanto Branch 2017.10.01 Matsudo


7. Miyashin M. Intentional tooth replantation for traumatized teeth in children. The 8Th Conference of Asian International Association of Dental Traumatology 2017.11.18 Bangkok,Tailand

8. Ijbara M, Wada K, Miyashin M. Enamel Microcracks Induced by Simulated Occlusal Wear in Mature, Immature and Deciduous Teeth. the 65th Annual Meeting of JADR 2017.11.19 Tokyo

[Works]

[Others]
Orthodontic Science

Orthodontic Science is one of the dental sciences which propose to control the craniofacial growth and development in equilibrium with the whole body, and also deals with the prevention and/or treatment of malocclusion and related disorders, by which the alteration of maxillofacial function with aging could be kept to the most suitable condition.

(1) Outline

Orthodontic Science is one of the dental sciences which propose to control the craniofacial growth and development in equilibrium with the whole body, and also deals with the prevention and/or treatment of malocclusion and related disorders, by which the alteration of maxillofacial function with aging could be kept to the most suitable condition.
(2) Research

Research Subjects
1) Biomechanical study of occlusion
2) Studies on biological response and functional adaptation followed by orthodontic and occlusal stimulation
3) Clinical application of autotransplantation in orthodontic treatment
4) Studies on interrelation between malocclusion and temporomandibular joint
5) Studies on occlusion and age-related changes in cranio-maxillofacial morphology and function
6) Studies on interrelation between cranio-maxillofacial complex and whole body
7) Development of mechanics and materials for orthodontic treatment
8) Pathophysiological studies on sleep and breathing disorders
9) Studies on interrelation between breathing and body function

(3) Education

Subjects of Education:
Orthodontic Science, Pathophysiology for Malocclusion, Biology for Functional Adaptation

(4) Lectures & Courses

Orthodontic Science
1) To explain the unhealthy physiological condition of malocclusion and deepen the scientific basis for orthodontic treatment.
2) To understand the biological reaction and adaptation of occlusal tissues to mechanical stresses such as occlusal force or orthodontic force, and also the changes with aging.
3) To explain the art for controlling the morphologic and functional problems of occlusion in orthodontic treatment, from the view points of biomaterials and biomechanics.
4) To enlighten the social dentistry for the needs and demands of orthodontic treatment.

Pathophysiology for Malocclusion
To understand the alteration of occlusal function and morphology with aging, and to explain the pathological condition of malocclusion from the viewpoint of physiology, biomechanics, biology and sociology.

Biology for Functional Adaptation
To understand the procedure of biological reaction and adaptation of occlusal system to the orthodontic stimuli, including the influence of aging, and to provide the control of the surroundings of the occlusal system.

(5) Clinical Services & Other Works

Clinical Services
In the field of practical orthodontic, with the development of materials and treatment techniques, we have taken initiatives in two big turning points at all time. Namely, one is the Direct Bonding System which has made it possible to attach brackets directly to the teeth surface without orthodontic metal bands. Another is the development of Super-Elastic Ti-Ni Alloy Wire, and following Improved Super-Elastic Ti-Ni Alloy Wire. With these new wires, we have provided an epoch-making orthodontic technique, where teeth could be moved more efficiently and safely with light continuous forces, and in consequences, the limits for teeth movement are expanded and the treatment outcomes are also improved. On the other hand, in order to determine the scientific basis for the needs of orthodontic treatment, we are engaging in the study of pathophysiology of malocclusion, and these research results are getting feedback to the orthodontic practices as soon as possible to stimulate the development of new treatment protocols.

Students in the graduate course not only pursue their scientific researches but also being educated in accordance with our curriculum for the post-graduated clinical program. In this program, we aim to bring up the leading persons of next generation who have highly specialized knowledge and skills of orthodontics as well as prominent minds of clinical researches.
6) **Clinical Performances**

Highlights of Clinical Services

1) Orthodontic treatments by using Improved Super-Elastic Ti-Ni Alloy Wire
2) Comprehensive Orthodontic Treatments

With the cooperation of related field, we provide comprehensive treatments for those patients with cleft lips and palates and other congenital anomalies, jaw deformities, maxillofacial functional disorders, periodontal diseases, impacted teeth, autotransplantation combined cases, and usages of implant anchorages.

7) **Publications**

**[Original Articles]**

1. Uchima Koecklin KH, Hiranuma M, Kato C, Funaki Y, Kataguchi T, Yabushita T, Kokai S, Ono T. Unilateral nasal obstruction during later growth periods affects craniofacial muscles in rats. Front Physiol. 2017.01; 7(669); 1-10


[Conference Activities & Talks]


2. Kenzo Watakabe, Ikuo Yonemitsu, Yuhei Ikeda, Mutsumi Miyazaki, Takashi Ono. Nasal obstruction in growing rats induces morphological and histological changes in the mandible. The 39th Annual Scientific Conference on Dental Research 2017.03.31 Ho Chi Minh city, Vietnam


4. Yamaguchi H, Ishida Y, Hosomichi J, Suzuki J, Ono T. Transfection of NF-κB decoy into the rodent periodontium using ultrasound-microbubble technique prevents the progression of the periodontitis. The 93rd congress of the European Orthodontic Society 2017.06.05 Montreux, Switzerland

5. Suzuki K, Kokai S, Uesugi S, Nishiyama A, Ono T. Evaluation of the laterality of the tissue oxygen saturation of masticatory muscles in subjects with facial asymmetry. The 93rd congress of the European Orthodontic Society 2017.06.05 Montreux, Switzerland

6. Ogawa T, Okihara H, Kokai S, Michikawa M, Ono T. Nasal obstruction induces memory and learning impairment and decreases the number of hippocampal neurons in growing mice. The 93rd congress of the European Orthodontic Society 2017.06.05 Montreux, Switzerland


17. Saito E, Watati I, Kubono M, Kyo S, Ono T. Reduced and recovered mechanical stress on the periodontium influence the AQP5 localization in salivary gland. The 76th Annual Meeting of the Japanese Orthodontic Society 2017.10.18 Sapporo


28. Manabe A, Ishida T, Ono T. Changes in the propotions of adenoid and tonsil size to the upper airway area in japanese individuals: a cross-sectional study. The 65th Annual Meeting of Japanese Association for Dental Research 2017.11.18 Tokyo
[Awards & Honors]

1. Ozawa E. The 76th Annual Meeting of the Japanese Orthodontic Society, Excellent Exhibition Award, Japanese Orthodontic Society, 2017.10

2. Yamada K. The Japanese Orthodontic Society, Best Paper Award, Japanese Orthodontic Society, 2017.10

3. Ishida T. The 76th Annual Meeting of the Japanese Orthodontic Society, Excellent Exhibition Award, Japanese Orthodontic Society, 2017.10

4. Ozawa E. The 76th Annual Meeting of the Japanese Orthodontic Society, Excellent Exhibition Award, Japanese Orthodontic Society, 2017.10

5. Ogawa T. The 76th Annual Meeting of the Japanese Orthodontic Society, Excellent Exhibition Award, Japanese Orthodontic Society, 2017.10
Cariology and Operative Dentistry

Professor: Junji Tagami
Associate Professor: Masayuki Otsuki
Junior Associate Professor: Toru Nikaido, Masatoshi Nakajima
Assistant Professor: Takako Yoshikawa, Yasushi Shimada( January), Go Inoue, Keiichi Hosaka, Tomohiro Takagaki, Rena Takahashi, Naoko Matsu( March),
Hospital Staff: Oto Aramaki( March), Naoko Matsu( March), Ayaka Chiba( March), Takaaki Sato( September), Kento Sato( June), Yukinori Kano( April),
Juri Hayashi( April September), Takashi Hatayama( April September), Nami Takashino( April September), Yusuke Kuno( September),
Shigeki Uchimuma( September), Akifumi Takahashi( October), Shin Rozan( October), Yuka Tsuda( November)

Specially Appointed Assistant Professor: Matin N.H.M. Khairul
JSPS Research Fellowship Noriko Hiraishi
Technical Assistant: Yuan Zhou( June)
Staff Assistant: Shiori Ogi, Takako Nakagawa
Graduate Student:
Chihiro Matsuura (~ March), Yukinori Kano (~ March), Yuki Naruse (~ March),
Juri Hayashi (~ March), Miho Sugiu (~ March), Yuta Sumitani (~ March),
Atsuko Tagami (~ March), Keiki Nakamura (~ March), Yukari Noda (~ March),
Takashi Hatayama (~ March), Yuka Tsuda (~ March), Yuan Zhou (~ March),
Nami Takashino (~ March), Ayaka Kusanagi Sato (~ March), Keita Taguchi (~ March),
Jorge Espigares( September)

Mai Okada, Junji Atomura, Akifumi Takahashi, Ayako Nakamoto, Tomoko Tabata,
Daisuke Araoka, Takuya Nakata, Thwe Zin Ei, LUONG DAO Minh Nguyet,
Amr Abdelaziz Aly Aly SAAD, SEGARRA Michelle Sunico, Wa Than Lin,
ALQARNI DHAIFALLAH ABDULLAH G, ALGHAMDI ALI GUZAN J,
KHINE Win Zan, KHIN Yupar Kyaw,
Sae Akehashi, Nao Takahashi, Yuna Kanamori, Yukina Ochiai, Kurumi Ide,
Yusuke Kuno, Yuki Ito, Shigeki Uchimuma, Daiki Nagano, Yusuke Kakiuchi,
Akira Nakane, RIMA ZAKZOUK, HALABI SOMAYAH ABDULRAHMAN A,
RUMMANI GHASSAN MAHMOOD S, ALQAHTANI ALI AWAD M,
ARAVETI SANDEEP KUMAR, HOSEA LAL RIN MUANA, SAI KHAM LYANN,
AYE KO KO, Meiken Hayashi, Shou Obayashi, Saori Muta, Kazuhide Yonekura,
Satomi Matsunaga, Shin Rozan, HESHAM HASSAN OSMAN MOHAMMED,
Yukiko Tanno, AHMED MOHAMED ABDELRAHMAN ABDOU,
MAHMOUD MOHAMED SAYED AHMED, SOE YU PAING, SWE ZIN AUNG,
QUTAIBA Y A A ALSANDI, SAN SAN MAY PHYO AUNG,
ALMASABI WALED ABDULQADER M,
WIJETUNGA CHAMARI LASINDRA, ERICK LUZ MADRIGAL(~ April),
Motoi Takahashi(~ April), Sakiko Tsuchiya(~ April), Kim Seunggun(~ April),
Kyoko Ishikawa(~ April), Toyoaki Kobayashi(~ April), Miyuki Shimizu(~ April),
Mayu Hasegawa(~ April), Shun Kobayashi(~ April), Nanako Ueda(~ April),
Misa Kashiba(~ April), Saki Uchiyama(~ April), Yosuke Minato(~ April),
Yuta Baba(~ April), LEILA NASIRY KHANLAR (~ April),
VICHEVA MARTINA GEORGIEVA(~ April), Citra Kusumasari (~ October),
Min Khant Ko Ko (~ October), Pa Pa Kay Khine (~ October)

Research Student: Shinji Ogura, Mineo Kijima,
VICHEVA MARTINA GEORGIEVA (~ March), ERICK LUZ MADRIGAL (~ March),
Nooruldeen Ali Saeed (~ April)

(1) Outline

TMDU possesses the longest history as a national dental university in Japan. We have contributed to the progress of science and education through presenting a number of world leading graduates in the field of den-
tistry. Many of their achievements are now recognized as global standards in the field of dental research and clinical practice.

At Cariology and Operative Dentistry, we believe that the ultimate goal of the oral health care programs is to provide well-being of the patients. In order to achieve this goal, besides the clinical training that we offer to the licensed graduate students, high-caliber research projects are being carried out aimed at developing, enhancing and evaluation of the materials and techniques in dentistry; particularly for adhesives, caries prevention, diagnosis and treatment, and oral health maintenance.

Cariology and Operative Dentistry is a home to the late professor Takao Fusayama, who developed the “Caries Detector” for removal of the caries, and promoted “Total-etch technique” and other restorative techniques using adhesive resin composite for the minimally invasive caries treatment.

Our group, consisting of members of the faculty, staff and graduate students, is among the international leaders in the ongoing dental research. I would hereby like to extend an invitation to those fellows and prospect graduate students interested in perusing high-level research and gaining an insight into modern concepts to join our diverse international team of scientists.

2) Research

1) Evaluation of dentin bonding systems
Adhesion of bonding materials to enamel, dentin and cementum of tooth are evaluated using methods such as the microshear and the microtensile bond strength tests. Factors affecting adhesion such as the region and caries state of tooth substrate, light-curing irradiation, release of fluoride from material, tooth preparation methods, root canal treatment of the tooth, etc. have been investigated. We have also focused on the difference between various adhesives system in terms of their composition, performance and bonding durability.

2) Super Enamel and Super Dentin
Using various electron microscopy techniques, we have demonstrated that resistance of enamel and dentin to acid attack could be increased in an acid-base resistant zone which was formed following the application of some self-etching dental adhesives. We proposed that the diffusion of such acidic monomers beyond the classic hybrid layer (interfacial zone) and their ion-exchange interactions with the available hydroxyapatite could result in formation of stable organic-inorganic complexes, and that the structures should be termed “super tooth”, which includes the reinforced enamel and dentin.

3) Development of OCT for establishing its clinical application
Optical coherent tomography (OCT) is a noninvasive, cross-sectional imaging system that can visualize the internal structures nondestructively and without exposure to X-ray or ionizing radiation. Our research has aimed to further develop OCT and introduce a dental OCT system that can be used to diagnose dental defects and diseases such as tooth cracking and caries.

4) Non-destructive test of adhesive restorations
We are working to establish a method for non-destructive detection of gap and secondary caries beneath composite restorations using optical coherence tomography (OCT).

5) Evaluation of polymerization behavior of light-cured resin composites
Aim to establish clinical techniques to compensate polymerization shrinkage stress of resin composite, we evaluated effect of adhesives, resin composite composition, light curing methods and cavity configuration factor (C-factor) on polymerization shrinkage stress using micro-focus X-ray computed tomography (micro-CT) and 3D visualization method.

6) Resin coating technique
Resin coating using a bonding agent and flowable composite benefits the adaptation of indirect restorations to dentin surface which is a key interface within a restoration. We have proposed that this resin coating technique should be technique of choice for placement of indirect restorations.

7) Research on optical properties of the dental structure
As a part of the OCT development project, we work on characterization of the basic optical properties such as attenuation coefficient and refractive index of dentin and enamel, and their changes following demineralization and remineralization.

8) Research on direct core build up materials
Adhesive performance to the root canal dentin by resin core build up systems has been evaluated. These materials can be used in combination with fiber posts.
9) Study on dental erosion
Erosive loss of enamel due to consumption of acidic beverages and some drugs has been evaluated using 3D
focus-variation microscopy as well as profilometry.

10) Caries risk assessment
We have investigated caries risk based on the measurement of saliva buffering capacity in samples collected from
patients. We have also probed the association between the pH of lesion surface and caries activity.

11) Adhesion of cariogenic bacteria to dentin surface
We have developed a model to experimentally evaluate factors affecting the ability of cariogenic bacteria such
as S.mutans to attach to the tooth surface in the initial phase of biofilm formation.

12) Biocompatibility of resin-based dental adhesives
Immunohistochemical studies have been performed to evaluate the effects of various adhesive materials on dental
pulp tissue.

13) The potential of fluoride- and/or Calcium containing materials on caries prevention
Inhibitory effects of CPP-ACP paste and fluoride on the enamel and dentin demineralization have been evalu-
ated by the micro-focus X-ray computed tomography (micro-CT) non-destructively. We have also established
a standard methodology for assessment of lesion parameters such as depth and mineral loss for micro-CT.

14) Evaluation of caries removal methods
We have evaluated the effect of caries removal method by the conventional rotary cutting instruments in com-
parison with new caries removal methods such as chemical removal agents, laser irradiation and abrasion on the
adhesion performance and restoration success.

15) Development and evaluation of aesthetic dental materials
We have worked on optical properties and color match of the composite resins, in addition to clinical applica-
tions of tooth whitening materials.

16) Clinical research
We have created a protocol to evaluate the long-term and short-term performance of restorative materials in
the patients who were admitted to the operative dentistry clinics at TMDU Dental Hospital.

3) Education
Cariology and Operative Dentistry section offers a four-year graduate program. First-year graduate students
attend lectures and seminars given in the graduate school and are expected to gain an understanding of the
fundamentals about methodology and the knowledge necessary for their research. The contents of the classes
given in our section include topics related to cariology and operative dentistry: caries diagnosis, biocompatibility,
caries treatment and restoration, prevention and control, dental materials, new instruments and equipment. In
keeping with the internationally orientated philosophy of this section, lectures are conducted in English and
are open to all foreign students. First-year graduate students also undergo clinical training the procedures of
modern adhesive restorations. Laboratory work, which commences in the first year, is performed under the
supervision of our faculty staff. During the four-year program, several papers are required to be presented
in domestic and / or international conferences and submitted to journals. The minimum requirements are
completing the prescribed courses, a supervised research project and a dissertation for the degree published in
a top international journal.

4) Lectures & Courses
The ultimate goal of the oral health care programs is to provide well-being of the patients. In order to achieve
this goal, besides the clinical training that we offer to the licensed graduate students, high-caliber research
projects are being carried out aimed at developing, enhancing and evaluation of the materials and techniques in
dentistry; particularly for adhesives, caries prevention, diagnosis and treatment, and oral health maintenance.

5) Clinical Services & Other Works
Full-time faculty see patients in Operative Dentistry and Endodontics, and provide restoration of teeth with
fillings for dental cavities, trauma and tooth wear, and root canal treatments. The faculty members supervise
both pre-and postdoctoral students in the clinic.
Clinical Performances

Our Operative Dentistry clinic provide restoration of teeth with fillings for dental cavities, trauma and tooth wear under Minimal intervention concept. The clinical services are based on accumulated scientific researches.

Publications

Original Articles


2. Ayaka Chiba, Takashi Hatayama, Kimisuke Kainose, Masatoshi Nakajima, David H Pashley, Noriyuki Wakabayashi, Junji Tagami. The influence of elastic moduli of core materials on shear stress distributions at the adhesive interface in resin built-up teeth. Dent Mater J. 2017.01; 36(1); 95-102


5. Noriko Hiraishi, Takahiro Maruno, Naoya Tochio, Ryohei Sono, Masayuki Otsuki, Tsutomu Takatsuka, Junji Tagami, Yuji Kobayashi. Hesperidin interaction to collagen detected by physico-chemical techniques. Dent Mater. 2017.01; 33(1); 33-42


— 39 —


22. Rena Takahashi, Erika Ota, Keika Hoshi, Toru Naito, Yoshihiro Toyoshima, Hidemichi Yuasa, Rintaro Mori, Eishu Nango. Fluoride supplementation (with tablets, drops, lozenges or chewing gum) in pregnant women for preventing dental caries in the primary teeth of their children Cochrane Database of Systematic Reviews. 2017.10;


[Misc]


[Conference Activities & Talks]

1. Inokoshi M, Shimizu H, Nozaki K, Takagaki T, Zhang, F, Vleugels J, Van Meerbeek B, Uo M, Minakuchi S. Crystallographic analysis of alumina sandblasted highly translucent dental zirconia. 95th General Session and Exhibition of the IADR 2017.03 San Francisco

2. Noda S, Kawashima N, Hashimoto K, Aramaki O, Yamamoto M, Okiji T. Dense culture conditions induced human dental pulp stem cell differentiation. 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco, CA

3. John Sorensen, Juri Hayashi, Carlota Suarez, Alireza Sadr. 3D Crack Detection and Quantification in Ceramic Restorations by OCT. 95th General Session & Exhibition of the IADR 2017.03.22

4. Alireza Sadr, Juri Hayashi, Yasushi Shimada, Junji Tagami. Effects of Fiber Reinforcement on Composite Adaptation in Deep Cavities. 95th General Session & Exhibition of the IADR 2017.03.22

5. Juri Hayashi, Alireza Sadr, Tomohiro Takagaki, Tomoko Numata, Yasushi Shimada, Junji Tagami, Yasunori Sumi. 3D assessment of Bulk-fill Composites Gap Formation and Polymerization Shrinkage. 95th General Session & Exhibition of the IADR 2017.03.22

6. Amr SAAD, Go Inoue, Junji Atomura, Toru Nikaido, Junji Tagami. µ TBS of RM-GIC on demineralized root dentin with several conditioners. 95th General session & exhibition of the IADR 2017.03.22

8. Noriko Hiraishi, Fumiaki Hayashi, Tomohiro Takagaki, Masayuki Otsuki, Junji Tagami. Solid-state NMR Investigation on the Mineral Structure in De/re-mineralized Dentin. 95th IADR General Session 2017 2017.03.25

9. T. Yoshikawa, A. Sadr. J. Tagami. Dye Penetration Test and Micro-CT Observation of Composite/Cavity-Wall Adaptation.. 95th, IADR 2017.03.25 San Francisco

10. Ali Alghamdi, Tomohiro TAKAGAKI, Yuki NARUSE, Toru Nikaido, Masaomi Ikeda, Junji Tagami. Influence of Time Elapsed After Alumina-Blasting on a CAD/CAM Resin-Block. 95th IADR General Session 2017 2017.03.25

11. Akifumi Takahashi, Tomohiro Takagaki, Toru Nikaido, Masaomi Ikeda, Takahiro WADA, Motohiro Uo, Junji Tagami. Effect of Phosphoric Acid Cleaning for Saliva Contaminated Zirconia Ceramics. 95th IADR General Session 2017 2017.03.25

12. Tomohiro Takagaki, Fumiaki Hayashi, Rui Guan, Noriko Hiraishi, Toru Nikaido, Junji Tagami. Adsorption Behavior of Phosphoric Functional Monomers to Y-TZP Surface. 95th IADR General Session 2017 2017.03.25

13. Sai Lyann, Tomohiro Takagaki, Toru Nikaido, Takahiro Wada, Motohiro Uo, Masaomi Ikeda, Junji Tagami.. Efficacy of Various Surface Treatments on Saliva Contaminated Lithium-disilicate Ceramics. 95th IADR General Session 2017 2017.03.25

14. Minh Nguyet Luong Dao, Alireza Sadr, Yasunori Sumi, Junji Tagami. Effects of Aging on Crack Formation Through Dentin and Composite. 95th General Session IADR 2017.03.25 San Francisco


16. Noriko Hiraishi, Fumiaki Hayashi, Tomohiro Takagaki, Masayuki Otsuki, and Junji Tagami. Solid-state NMR Investigation on the Mineral Structure in De/re-mineralized Dentin. 2017 IADR/AADR/CADE General Session 2017.05.22 San Francisco, USA

17. Khin Kyaw , Noriko Hiraishi, Masayuki Otsuki, and Junji Tagami. Effect of Calcium-phosphate Toothpaste on Staining Susceptibility of Acid-eroded Enamel. 2017 IADR/AADR/CADE General Session 2017.05.22 San Francisco, USA

18. MATSUNAGA Satomi, TAKAGAKI Tomohiro, MATSUI Naoko, ARISAKA Yoshinori, TAMURA Atsushi, IKEDA Masaomi, NIKAIDO Toru, YUI Nobuhiko, TAGAMI Junji. The development of a new "reversible-adhesion" resin cement with a UV-cleavable PRX cross-linker. The 146th Meeting of the Japanese Society of Conservative Dentistry 2017.06.07 Aomori

19. HAYASHI Meiken, TAKAGAKI Tomohiro, IKEDA Masaomi, NAKASHIMA Syozi, NIKAIDO Toru, KUBO Shisei, TAGAMI Junji. CLSM observation of morphological progression of non-curious cervical lesions. The 146th Meeting of the Japanese Society of Conservative Dentistry 2017.06.07 Aomori

20. Noda S, Kawashima N, Hashimoto K, Yamamoto M, Aramaki O, Tagami J, Okiji T. Effects of culture density on stem cell properties of human dental pulp stem cells. 2017.06.08


22. Junji Tagami. About composite resin restoration. 2017.06.21 Showa University

23. Tomohiro Takagaki. Predictable use of resin cement in all-ceramic cementation; science for durable bonding and esthetic result.. Hokkaido Summer Institute 2017.07.26

25. Nguyen TTT, Seki N, Moross J, Hosaka K, Sunaga M, Morio I, Kinoshita A. The effectiveness of newly developed computer-assisted simulation materials on overseas learners. The 28th SEAADE (South East Asia Association for Dental Education) Annual Scientific Meeting 2017.08.11 Taipei, Taiwan


27. Junji Tagami. Direct bonding strategies in various clinical situations. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.30


29. Meet-the-Expert(Dental materials):Dental materials. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.31

30. Junji Tagami. Is bulkfill composite reliable?. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.31


32. Dhaifallah Alqarni, Keiichi Hosaka, Teerapong Mamanee, Masatoshi Nakajima, Masaomi Ikeda, Junji Tagami. Effect of different surface treatments on repair uTBS of composite bonded to resin matrix after water exposure. The 10th World Congress of International Federation of Esthetic Dentistry 2017.09.14 Toyama

33. Kyaw KY, Niraishi N, Otsuki M, Tagami J. Effect of application of desensitizers before bleaching on change of tooth shade. 10th World Congress of International Federation of Esthetic Dentistry 2017.09.14 Toyama, Japan

34. Tomohiro Takagaki. Predictable use of resin cement in all-ceramic cementation: science for durable bonding and esthetic result. The 10th World Congress of International Federation of Esthetic Dentistry 2017.09.16 Toyama

35. Keiichi Hosaka. Bioactive technology meets MI esthetic direct composite restorations. - The present and future -. The 10th World Congress of International Federation of Esthetic Dentistry 2017.09.16 Toyama

36. Luong MND, Otsuki M, Shimada Y, Sumi Y, Tagami J. Bleaching effect of light sources with various wavelengths. 10th World Congress of International Federation of Esthetic Dentistry 2017.09.17 Toyama, Japan

37. Lasindra WC, Otsuki M, Tagami J. Effect of pH on tooth bleaching action in vitro. 10th World Congress of International Federation of Esthetic Dentistry 2017.09.17 Toyama, Japan


42. Shimizubata M, Inokoshi M, Wada T, Takahashi R, Uo M, Minakuchi S. Mechanical property and microstructural analysis of an ion-releasing S-PRG filler contained cement. The 70th General Session of the Japanese Society for Dental Materials and Devices 2017.10.15 Niigata

43. SWE ZIN AUNG, TAKAGAKI Tomohiro, IKEDA Masaomi, KOSUKE Nozaki, NIKAIDO Toru, TAGAMI Junji. The Effect of Different Light-curing Units on Degree of Conversion of Flowable Composites. The 147th Meeting of the Japanese Society for Conservative Dentistry 2017.10.26 Morioka

44. SAN SAN MAY PHYO AUNG, Tomohiro TAKAGAKI, SAI KHAM LYANN, Masaomi IKEDA, Toru NIKAIDO, Junji TAGAMI. Effect of Alumina-blasting Pressures on the Bonding Performance to Ultra/Super-translucent Zirconia Ceramics. The 147th Meeting of the Japanese Society of Conservative Dentistry 2017.10.26

45. Shin Rozan, Rena Takahashi, Toru Nikaido, Junji Tagami. The effect of resin coating technique on dentin bond strength and internal adaptation of CAD/CAM-fabricated inlays. The 147th Meeting of the Japanese Society of Conservative Dentistry 2017.10.27 Iwate, Japan

46. Takako Yoshikawa, Alireza Sadr. Light-Cured Composite Adaptation to the Cavity Wall and Polymerization Behavior Analysis using μCT. 2017.10.27

47. Ali Alqahtani, Go Inoue, Toru Nikaido, Junji Tagami. Effect of concentrations of potassium and sodium fluoride on micro-shear bond strength and inhibition of demineralization. 147st Hozon Gakkai 2017.10.27


49. Rena Takahashi, Atsuko Tagami, Toru Nikaido, Junji Tagami. The dentin bond strength of dual-cure resin cements. Brazil-Japan Joint Research Workshop on Adhesive Dentistry 2017.11.01 Campinas, Brazil

50. Toru Nikaido. Assessment of adhesive materials for direct composite restorations. Brazil-Japan Joint Research Workshop on Adhesive Dentistry 2017.11.01 UNICAMP, Sao Paulo, Brazil

51. Takaaki Sato, Tomohiro Takagaki, Rui Guan, Nikaido Toru, Junji Tagami. Evaluation of the enamel/bond interfaces of Multimode One-bottle Self-etching Adhesives. Brazil-Japan Joint Research Workshop on ADHESIVE DENTISTRY 2017.11.01 Brazil, Piracicaba


54. Keiichi Hosaka. Direct Composite Restorations Based on Adhesive Technology. Invited Lecture 2017.12.08 Masaryk University, Brno, Czech republic

[Awards & Honors]

1. Wilmer Souder Award, The International Association for Dental Research(IADR), 2017.03
Fixed Prosthodontics

Professor
Hiroyuki MIURA

Associate Professor
Kenichi YOSHIDA

Junior Associate Professor
Daizo OKADA
Wataru KOMADA

Assistant Professor
Chiharu SHIN
Shiho OTAKE
Satoshi OMORI
Reina NEMOTO

Attending Staff
Miho SATO
Tazuko MAKIYAMA
Yoko ISHIKAWA
Natsuko IWATA
Mariko KUBO
Kazuhisa FUJITA
Hideto MATSUI
Risa YAMADA
Michika MINAMIFUCHI
Ayana URABA
Bakhit Mohammed Yassin M
Paisankobrit Vibal
Rana ASANO
Ayaka SHIRASAKI
Mina TAKITA
Shiro RIKITOKU
Kai SHIBAGUCHI
Kiriko SUGANO
Kenichiro HAYASHI
Mayuko MATSUMURA
Erika SUKUMODA
Michiko NODA
Kunihiko MIZUSAWA
(1) Research

1) Occlusion and Mastication (mandibular position, mandibular movement, articulator, masticatory efficiency)

2) Influence of mechanical stress caused by occlusal contact on stomatognathic system. (Tooth displacement, distortion of alveolar bone, occlusal contact, proximal contact etc.)

3) Relationship of main occluding area and occlusal contact

4) Research on post and core (materials, stress analysis etc.)

5) Clinical application of latest technology and development of new materials (CAD/CAM, Zirconia, optical impression etc.)

6) Influence of occlusal contact for an important prosthesis on the periodontal tissues of the antagonist.

7) Application of laser welding in crown and bridge restorations.

8) Influence of dental materials for periodontal tissues and biological body.

9) Functional analysis of abnormal stomatognathic function

(2) Lectures & Courses

The major subjects of the studies are occlusion of Cr-Br prostheses (fixed restoration such as crown and fixed partial denture), analysis of mandibular movement, influence of crown and periodontal tissue and its systemic affect, accuracy of manufacturing processes of crown (i.e. casting, soldering, luting and adjustment of occlusion), functional analysis of stomatognathic system and development of apatite ceramic implant. The research themes are investigated with measurement systems of mandibular movement, measuring instruments of tooth micro-displacement, electromyography, measurement apparatus of dimensional accuracy, EPMA (electron probe microanalyzer) for analyzing very small amount of dental alloy and histopathological methods. Clinical training and general lecture on prosthodontics are prepared for the graduate students in the first year. After the second year they will have special training for their research methods and experiments will be performed according to the research plan. In the last year the students will write the paper for thesis under the direction of the professor.

(3) Clinical Services & Other Works

1) Clinic for prosthodontics (Prosthodontics practice clinic)
This clinic is organized by clinical teams, and 4 to 8 dentists compose 1 team working in cooperation between teams. Here offers a complete range of restorative, rehabilitative, and esthetic dentistry, treatment types include since simple one teeth to complete oral rehabilitation using the latest technologies.

2) Clinic for dental allergy (Dental allergy clinic)
This clinic provides allergy tests test for dental alloys and dental materials on potential patients before dental treatment, besides, patients with skin and/or oral desease histories induced by previous dental restorations. The causal allergen/s is/are identified by patch tests or if some metal restoration is allergy set on, is analyze by Electron Probe Micro Analyzer (EPMA), removing out only restoration such content allergens.
(4) Publications

[Original Articles]


7. Yoko Ishikawa, Wataru Komada, Tasuku Inagaki, Reina Nemoto, Satoshi Omori, Hiroyuki Miura. The effects of post and core material combination on the surface strain of the 4-unit zirconia fixed partial denture margins. Dent Mater J. 2017.11; 36(6); 798-808


[Conference Activities & Talks]

1. K.Hayashi, S.Otake, S.Omori, R.Nemoto, R.Asano, S.Rikitoku, H.Miura. Bond strengths of cements to a new Pressable ceramics. IADR 2017.03.24 San Francisco, the USA


Pulp Biology and Endodontics

Professor:
Takashi OKIJI

Associate Professor:
Mitsuhiro SUNAKAWA

Junior Associate Professor:
Hideharu IKEDA, Nobuyuki KAWASHIMA

Assistant Professor:
Arata EBIHARA, Hiroyuki MATSUMOTO, Tomoatsu KANEKO, Satoshi WATANABE, Jun KAWAMURA

Hospital Staff:
Kei KOMATSU, Yoshiko IINO, Daisuke TOKITA, Kanako YAO, Masahiko KUSANO

Graduate Student:
Kazuto FURUHATA, Sailiman AIERKEN, Alamuddin BAKHIT, Miki NISHIJO, Kenrato HASHIMOTO
Donghoon KANG, Keisuke NARA, Sonoko NODA, Tomoyuki HONGO, Mayuko FUJII
Bayan RASHED, Youhei FUKUMORI, Yuki KASAHARA, Shunsuke KIMURA, Masashi KURAMOTO, Bin GU
Akira KOUNO, Yasuhiro HOSHIHARA, Keiichiro MAKI, Shinya YAMAUCHI, Thaw Dar OO, Phyo Pyai SONE
Su Yee Myo ZAW, Pyae Hein HTUN, Taro NAKATSUKASA, Hiroki MURANO, Yadanar Su PHYO, Ao XU
Aung Nyein Pyae SONE, Htoo Shwe Sin THEIN, Saleh Sherif Adel ABDELFATTAH, Zar Chi Thein ZAW

Research Student:
Tamae HASEGAWA

(1) Outline

The Department of Pulp Biology and Endodontics deals with endodontics/endodontology, and is concerned with research and clinical practice on the prevention, diagnosis and treatment of dental pulp and periapical diseases. In order to preserve and well maintain the function of the teeth in the oral cavity, it is important to understand the structural and functional features of the dental pulp and protect it carefully from noxious stimuli. However, pulp diseases, if left untreated, may progress to develop pulp necrosis and apical periodontitis, where meticulous treatment is required to eliminate infection from the complex root canal system. The goal of endodontics is to achieve long term maintenance of tooth function by the prevention and treatment of pulpal and periapical diseases.

(2) Research

1) Properties of oral tissue-derived mesenchymal stem cells/ Horizon of dental pulp regeneration
2) Crosstalk between pulpal inflammation and regeneration
3) Evaluation of newly developed endodontic sealers
4) Evaluation of endodontic technique using computational fluid dynamics (CFD)
5) Application of laser to endodontics
6) Application of optical coherence tomography
7) Analysis of nickel-titanium endodontic instruments
8) Electrophysiological approach to cell-to-cell couplings between odontoblasts
9) Diffusion through enamel and dentin
10) Lymphangiogenesis in the dental pulp
11) Influence of sympathetic nervous control on dentinogenesis of odontoblasts
12) Neuro-scientific research for dental pain
13) Diagnosis using CBCT & Diagnosis of vertical root fractures by analyzing reconstructed three-dimensional models obtained from CBCT images

(3) Education

The educational aim of the Department of Pulp Biology and Endodontics is to cultivate students so that they can obtain knowledge and skills required for leading scientists, researchers or practitioners of endodontics. Since recent progress of pulp biology and endodontics is remarkable, the students are educated to acquire the newest knowledge on modern endodontology and its related subjects, such as neuroscience, microbiology, molecular biology, immunology and biomaterial sciences, and are trained to master the newest technology of endodontics. All the students are asked to add new findings to the field of endodontics based on their own original research.

(4) Clinical Services & Other Works

The Department of Pulp Biology and Endodontics is in charge of the Clinic of Operative Dentistry and Endodontics in our Dental Hospital, together with the Department of Cariology & Operative Dentistry, and offers the global standard of care in the treatment of pulpal and periapical diseases to our patients. We provide clinical care in the full spectrum of endodontics including:
· Vital pulp therapies,
· Nonsurgical root canal therapies,
· Root canal retreatments,
· Endodontic microsurgeries,
· Internal tooth bleaching, and
· Post-endodontic restorations

(5) Clinical Performances

The latest development of endodontics is remarkable as seen in root canal instrumentation by super-elastic Ni-Ti rotary files, diagnosis by cone beam computed tomography, and microendodontics by using a surgical operating microscope. In particular, microendodontics has dramatically changed conventional “blind” endodontics into more predictable endodontics since it allows us to obtain accurate diagnostic information and provide precise procedures under an illuminated and magnified view. Also, we seek to provide evidence-based endodontic treatment based on our laboratory and clinical research.

(6) Publications

[Original Articles]


5. Sueyama Y, Kaneko T, Ito T, Kaneko R, Okiji T. Implantation of endothelial cells with mesenchymal stem cells accelerates dental pulp tissue regeneration/healing in pulpotomized rat molars. Journal of Endodontics. 2017.06; 43(6); 943-948


10. Kawashima N, Noda S, Yamamoto M, Okiji T. Properties of dental pulp-derived mesenchymal stem cells and the effects of culture conditions. Journal of Endodontics. 2017.09; 43(9S); S31-S34

11. Niwano K, Okiji T, Noiri Y. Novel analysis of endodontic file manipulation using a newly developed apparatus for recording force and torque values with real-time lissajous curve display. Journal of Dentistry and Oral Disorders. 2017.09; 3(5); 1073

12. Ito T, Kaneko T, Sueyama Y, Kaneko R, Okiji T. Dental pulp tissue engineering of pulpotomized rat molars with bone marrow mesenchymal stem cells. Odontology. 2017.10; 105(4); 392-397


[Books etc]

[Conference Activities & Talks]
1. Kawashima N, Noda S, Hashimoto K, Saito M, Okiji T. Meis2 induces odonto-/osteoblastic differentiation and mineralization. 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco, CA

2. Noda S, Kawashima N, Hashimoto K, Aramaki O, Yamamoto M, Okiji T. Dense culture conditions induced human dental pulp stem cell differentiation. 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco, CA

3. Okiji T. Vital pulp therapy: biological basis & current concepts. Capital Medical University 2017.05.26 Beijing
4. Bin GU, Tomoatsu KANEKO, Yukiko SUEYAMA, Phyo Pyai Sone, Takashi OKIJI. Kinetic Analysis of M2 Macrophages in the Regenerative Process of Rat Engineered Pulp Tissue. The 73rd Annual Meeting of The Japanese Society of Microscopy 2017.05.31

5. Tomoatsu Kaneko, Yukiko Sueyama, Bin Gu, Takashi Okiji. Differentiation of Mesenchymal Stem Cells Implanted into Rat Pulpotomized Pulp Chambers. The 73rd Annual Meeting of The Japanese Society of Microscopy 2017.05.31


7. Bin GU, Tomoatsu KANEKO, Yukiko SUEYAMA, Phy Pyai Sone, Su Yee Myo Zaw, Takashi OKIJI. Kinetic Analysis of M2 Macrophages in the Regenerative Process of Rat Engineered Pulp Tissue. 2017.06.08


9. Noda S, Kawashima N, Hashimoto K, Yamamoto M, Aramaki O, Tagami J, Okiji T. Effects of culture density on stem cell properties of human dental pulp stem cells. 2017.06.08


20. Distribution of LacZ-expressing Stem Cells in Rat Engineered Pulp Tissue. The 38th Annual Scientific Meeting of Japan Endodontic Association 2017.07.22


23. Su Yee Myo Zaw, Kaneko T, Sueyama Y, Gu B, Phyo Pyai Sone, Okiji T. The fate of stem cells implanted in rat dental pulp. FDI World Dental Congress 2017.08.29 Madrid, Spain

24. Ebihara A. Vertical Root Fracture. Lecture at Himeji Dental Association 2017.09.02 Himeji


26. Microendodontics. Dalian Medical University, Special lecture 2017.09.29 Dalian

27. Kang D, Wada T, Uo M, Okiji T. The study for the improvement of compressive strength and operability of the synthesized calcium silicate cement. The 70th Meeting of The Japanese Society for Dental Materials and Devices 2017.10.15 Niigata


31. Ebihara A. Application of CBCT to Endodontics. 22nd Clinical Imaging Conference, Japan Radiological Society 2017.11.12 Morioka

32. Ikeda H. Are odontoblasts pain receptor cells?. Pulp biology symposium on sensory transduction in the dental pulp 2017.11.17 Bangkok, Thailand


34. Gu B, Kaneko T, Sueyama Y, Su Yee Myo Zaw, Phyo Pyai Sone, Murano H, Okiji T. M1/M2 macrophage recruitment during coronal tissue-engineering in rat molars. JADR2017 2017.11.18 Tokyo


38. Kawashima N, Noda S, Yamamoto M, Okiji T. Hard-tissue forming properties of dental pulp derived-mesenchymal stem cells. 2017 Faculty Annual Scientific Meeting of Hong Kong University 2017.12.14 Prince Philip Dental Hospital, Hong Kong University, Hong Kong

[Awards & Honors]

1. Outstanding Reviewer Status for Archives of Oral Biology in the past two years, Archives of Oral Biology, 2017.11
[Others]

1. 2017 Marquis Who’s Who Lifetime Award Winner, 2017.06
   We are pleased to announce that Marquis Who’s Who has selected you for our official 2017 Albert Nelson Marquis Lifetime Achievement Award. You have been selected to receive this prestigious award as a result of your hard work and dedication to your profession.

2. Co-work with Department of Biochemistry and Physiology, Mahidol University, Thailand, 2017.11
   Co-work with Department of Biochemistry and Physiology, Mahidol University, Thailand
Removable Partial Prosthodontics

Professor - Noriyuki Wakabayashi
Associate professor - Kenji Fueki
Junior associate professor - Takeshi Ueno
 Assistant professors
- Ichiro Minami, Juro Wadachi, Eiko Kohno, Junnichiro Wada, Natsuko Murakami, Atsushi Takaichi
Hospital staff
- Natsuki Suzuki, Yuki Arai, Yasuha Nogawa, Takeshi Ootsubo, Hideaki Inagawa, Yuka Inamochi, Kensuke Takakusaki, Yasuo Nakajima, Hitomi Matsumo, Chie Watanabe
Graduate students

(1) Outline
The Department of Removable Partial Prosthodontics specializes in removable partial denture treatment, which is one of the major disciplines of clinical dentistry. The department has taken the baton from the First Department of Prosthodontics and the Department of Masticatory Function Rehabilitation. Our objectives are to enhance the art and science of removable prosthodontics for the management of various oral conditions associated with tooth loss, from a single missing tooth to a single remaining tooth, in the maxillary and/or mandibular arch.

(2) Research
1. Function and Physiology in Partial Denture Wearers
2. Optimization of Partial Denture Design based on Stress Analysis
3. Development and Applications of New Prosthodontic Biomaterials
4. Biology of Oral Tissues in Denture Wearers
5. Epidemiology and Education for Removable Partial Prosthodontics

(3) Education
School of Dentistry
Year 1
Introduction to Dentistry
(4) Lectures & Courses

The Department of Removable Partial Prosthodontics offers a variety of educational courses pertaining to the specialized clinical management of tooth loss, primarily for undergraduate students at the School of Dentistry. The courses include lectures, tutorials, hands-on sessions, clinical simulations, and clinical internship instructions.

The ability to perform clinical operations on patients with tooth loss, including the skills required for medical interviews, oral examinations, diagnosis, decision making, impression making, bite registration, denture design and technology, and denture delivery and maintenance, is essential for clinical dental professionals. The objectives of our courses are to provide learning and training in contemporary removable prosthodontics and enhance the knowledge and skills of students to help them develop and flourish in their future career as dental and oral health professionals.

(5) Clinical Services & Other Works

All faculty members of the Department of Removable Partial Prosthodontics are assigned to treat patients at the Prosthodontics department in the Dental Hospital of the Tokyo Medical and Dental University. While the rate of tooth retention has increased in comparison with previously reported rates, the number of patients in need of a removable partial denture has increased. Our specialists primarily work on advanced cases that are referred from other departments and outside the hospital. The departmental mission also includes the development and application of new prosthodontic materials, their clinical trial, and the spread of novel and inventive knowledge to the community.

(6) Clinical Performances

The department specializes in removable partial prosthodontics and aims to restore missing teeth and associated oral tissues; improve physiological functions such as occlusion, mastication, swallowing, and speech; maintain normal oral sensation; and restore the original appearance of individual patients.
Treatment modalities, materials, and denture design are all based on the case history and chief complaint of the patients. The ultimate goal is to improve the oral health-related quality of life of patients.

(7) Publications

[Original Articles]

1. Akihito Uezato, Mitsuhiro Enomoto, Meiyo Tamaoka, Mizue Hobo, Shusuke Inukai, Masayuki Hideshima, Yasunari Miyazaki, Toru Nishikawa and Kauyoushi Yagitshit. Shorter sleep onset latency in patients undergoing hyperbaric oxygen treatment Psychiatry and Clinical Neurosciences. 2017.01; 71(1); 73-74


3. Ayaka Chiba, Takashi Hatayama, Kimisuke Kainose, Masatoshi Nakajima, David H Pushley, Noriyuki Wakabayashi, Junji Tagami. The influence of elastic moduli of core materials on shear stress distributions at the adhesive interface in resin built-up teeth. Dent Mater J. 2017.01; 36(1); 95-102

4. Sasipin Lauvahutanon, Maho Shiozawa, Hidekazu Takahashi, Naohiko Iwasaki, Meiko Oki, Werner J. Finger, Mamsung Arksornnikit. Discoloration of various CAD/CAM blocks after immersion in coffee Restorative Dentistry and Endodontics. 2017.01; 42(1); 9-18

5. Magdalini Thymi, Corine Visscher, Eiko Yoshida-Kohno, Wim Crielaard, Daniel Wismeijer, and Frank Lobbezoo. Associations between sleep-bruxism and (peri-) implant complications: a prospective cohort study. BDJ Open. 2017.03; 3(17003);


[Misc]
1. Yuki Arai, Ryunosuke Kazama, Noriyuki Wakabayashi, Masayoshi Fukushima. Monolithic zirconia restorations for chairside single-visit dentistry 2017.02; 129(2); 342-352
3. Wakabayashi N, Ueno T, Fueki K. Major and minor connectors as partial denture components designed to aim for multiple roles in denture function Ann Jpn Prosthodont Soc. 2017.07; 9(3); 205-210

[Conference Activities & Talks]
5. Kajima Y, Takaichi A, Takahashi H, Wakabayashi N. Effects of support structure on the fatigue strength of additive fabrication. The 126th annual meeting of the Japan Prosthodontic society 2017.07.02 Yokohama


12. Shota Hayashi, Masayuki Hideshima, Naoki Ishihara, Tomohiro Kurashima, Shusuke Inukai, Yuuko Mitsuuma, Shuhei Nakamura, Toshihide Fujie, Yasunari Miyazaki, Meiko Tamaoka. Conversion from continuous positive airway pressure therapy to oral appliance therapy for obstructive sleep apnea in Tokyo Medical and Dental University Hospitals. 16th the Japanese Academy of Dental Sleep Medicine 2017.11.04 Yamaguchi, Japan


15. N Murakami. A removable partial denture supported by structurally compromised and endodontically treated abutments for a patient exhibiting high bite forces. The 21st Scientific Meeting of Japan Prosthodontic Society Tokyo branch 2017.12.02 Tokyo Dental College Suidobashi Campus


[Awards & Honors]

1. Dentsply Sirona Merit Award, The 126th Scientific Meeting of Japan Prosthodontic Society, 2017.07

2. DENTSPLY Sirona Award, Japan Prosthodontic Society, 2017.07
Oral Implantology and Regenerative Dental Medicine

Outline

Prosthodontic treatment with dental implants (implant treatment) is extremely effective as a treatment method for edentulous patients and this treatment has been currently practiced widely. However, there are several problems that must be solved. Most of the staffs and students are treating patients with dental implants in Dental Implant Clinic, Dental Hospital. Dental Implant Clinic has been certified as a training facility of
the Japanese Society of Oral Implantology and the Japanese Academy of Oral-Maxillofacial Implants. Due to the wide spread of implant treatments, patients suffering problems after implant treatments are increasing. Furthermore, patients with some difficulties in dental implant treatments also visit the clinic. Under these circumstances, we are conducting researches on materials and methods related to implant treatment. We are also conducting researches of bone and soft tissue regenerations related to implant treatment. We are constantly aiming for the world’s top runner in clinical treatments and researches.

(2) Research

Implant treatment is currently predictable and effective; however, there are several problems that must be solved. Continuing from the previous year, we conducted the following studies.

(1) Relationship between implants and implant supporting tissues
(2) Adjustment of the superstructure of the implant
(3) Method of Inspection of Implant Surrounding Tissue
(4) Prevention and treatment of peri-implant inflammation
(5) Development of a biocompatible implant
(6) Development of bone and soft tissue regeneration method
(7) Differentiation of adipose tissue-derived stem cells

The results of these studies were presented in the academic meetings and scientific journals.

(3) Education

4th grade students of Dental School: Lectures and trainings.
6th grade students of Dental School: Trainings in the clinic.
3rd grade students of Oral Health Care Course: Lectures and trainings.
Students of Graduate School of Medical and Dental Sciences: Lectures and trainings
34-35 students of doctor course in the department: Guiding researches
22 graduate research students in the department: Guiding researches

(4) Lectures & Courses

Research is always ongoing rapidly. Thus, today’s common sense is likely to become insane in the future. Contents in a textbook are not always right. It is important to always think flexibly.

(5) Clinical Services & Other Works

In Dental Implant Clinic, we treated many partially or fully edentulous patients with dental implants. If soft tissue management and/or bone augmentation procedures are required, we also perform these surgeries. Number of patients in Dental Implant Clinic is increasing every year and approximately 100 patients visited every day, which is extremely over our capacities. Approximately 1,700 implants were placed in 2017. Patients with some clinical problems, who are treated in other clinics, are increasing and this is a great concern. Such patients visited our clinic and we fixed most of the problems.

(6) Clinical Performances

We are safely providing implant treatments of highly functional and aesthetic level with long-term good prognosis. We are also conducting cutting-edge clinical researches of dental implant and regenerative dental medicine.


[Misc]


[Conference Activities & Talks]


2. Shinji Kuroda. Anatomy and Imaging, Diagnosis and Treatment Planning. Myanmar Dental Association Basic Dental Implant Training 2017.02.18 Myanmar


5. Kasugai S. Four keys in your daily dental practice and life. Continual Educational Course by Myanmar Dental Association 2017.03.25 Summit Parkview, Yangon, Myanmar


8. Iwaki Maiko, Kanazawa manabu, Miyayasu Anna, Sato Daisuke, Kasugai Shohei, Minakuchi Shunsuke. Prospective study of immediate Loaded two-implants mandibular overdentures: 5-years follow up. 2017.06.30 Yokohama


Plastic and Reconstructive Surgery

Professor: Mutsumi Okazaki  
Junior Associate Professor: Hiroki Mori  
Assistant Professor (Hospital Staff): Noriko Uemura  
Project Assistant Professor (Hospital Staff): Kentaro Tanaka  
Graduate Student: Aki Takada, Takuya Higashino, Tsutomu Homma, Satoshi Usami, Mayuko Hamanaga, Nobuko Suesada

(1) Research

Basic research
1. A mechanism and prophylaxis of the post-inflammatory pigmentation  
2. A scarless wound healing  
3. The blood circulation study of the flap using indocyanine green  
4. Donor specificity on various flaps or full thickness skin  
Clinical research
1. Sensory recovery and contour prediction in the breast reconstruction  
2. The algorithmic development and the evaluation of various reconstructions in the skull base reconstruction  
3. The development of reconstructive method after an oral cavity / pharyngeal cancer resection - Aiming at the functional preservation  
4. The classification of the symptom and static and dynamic reconstruction of the facial paralysis  
5. A classification and the algorithmic development in blepharoptosis surgery  
6. The objective evaluation for the ischemic limb and therapeutic strategy utilizing wound healing mechanism  
7. The prospective studies about the color reproducibility of the medical tattoo in the nipple areola reconstruction

(2) Education

Plastic surgery is a specialized branch of surgery concerned with the repair of deformities and the correction of functional deficits. The specialty of plastic surgery covers a wide range of procedures, and unlike other medical specialties which concentrate on one particular area of the body, plastic surgeons are involved in the reconstruction and remodeling of nearly all external body structures.

(3) Clinical Performances

We cover the whole field of plastic surgery. In particular, we deal with the following field; congenital anomaly (cleft lip and palate, microtia blepharoptosis or polydactyly etc), LAERs, cutaneous malignant tumor, skin ulcer, breast reconstruction, head and neck reconstruction, facial palsy, axillary osmidrosis.
(4) Publications

[Original Articles]


2. Runa Mihara, Hiroki Mori, Mutsumi Okazaki. Nipple Reconstruction with Dorsal Skin Provides Better Projection than Reconstruction with Abdominal or Breast Skin with Cartilage Grafting. Aesthetic Plast Surg. 2017.02; 41(1); 31-35


4. Satoshi Usami, Mutsumi Okazaki, Tomohisa Nitta, Noriko Uemura, Tsutomu Homma, Keiichi Akita. Histological investigation of common insensate flaps obtained from the hand and forearm regions for use in fingertip reconstruction. J Plast Surg Hand Surg. 2017.06; 51(3); 182-186

5. Tsutomu Homma, Mutsumi Okazaki, Kentaro Tanaka, Noriko Uemura. Simultaneous Surgical Treatment for Smile Dysfunction and Lagophthalmos Involving a Dual Latissimus Dorsi Flap. Plast Reconstr Surg Glob Open. 2017.07; 5(7); e1370


8. Kentaro Tanaka, Kimihiro Igari, Mitsuhiro Kishino, Satoshi Usami, Tsutomu Homma, Takahiro Toyofuku, Yoshinori Inoue, Mutsumi Okazaki. The possibility of free tissue transfer as a nutrient flap for critical ischemic foot: A case report. Microsurgery. 2017.09; 37(6); 694-698

[Conference Activities & Talks]

1. Usami S, Inami K. Fingertip reconstruction using posterior interosseous artery perforator flap. 9th Congress of World Society for Reconstructive Microsurgery-WSRM2017 2017.06.14 Seoul Korea

2. Tanaka Ken, Okazaki M. The Role of Microsurgery in the face of Peripheral Vascular Disease in the Diabetic Foot. 9th Congress of World Society for Reconstructive Microsurgery 2017.06.15 Seoul Korea
Head and Neck Surgery

Professor: Takahiro Asagkage
Project professor: Seiji Kishimoto
Junior associate professor: Yosuke Ariizumi
Assistant professor: Yusuke Kiyokawa, Fuminori Nomura
Senior Resident: Akihisa Tasaki, Ryuhei Okada, Hiroaki Kawabe
Student: Hirofumi Fukushima, Takao Tokumaru, Masaharu Kishikawa

(1) Outline

Our department is responsible for clinical management, education and research in the field of head and neck surgery. Clinically, the Department of Head and Neck Surgery manages the tumor of extensive area of head and neck, except brain, eye and vertebra. Surgical and medical treatment of the head and neck tumors are mainly employed in our department.

(2) Research

Surgical approaches to the skull base and deep area of the face.
Surgical anatomy of the skull base.
Establishment of the standard neck dissection.
Treatment of pediatric head and neck tumors.
Chemoradiotherapy for head and neck cancers.
Clinical application of navigation system and 3D entity model surgery for skull base surgery.
Diagnosis and treatment for superficial squamous cell carcinoma of head and neck region.
Human papilloma virus infection and head and neck cancer.
Polymorphisms in alcohol metabolism genes and Head and Neck Cancers.

(3) Education

Education: Undergraduate Course
In the classes at the 3th grade of medical school, head and neck oncology are systematically lectured. Clinical practice is experienced at the 4th to 6th grade in the out-patient clinic, the ward, and operating theater.

Education: Graduate Course
Education and researches at the graduate school are focused on (1)surgery of the head and neck tumor, (2)clinical management of the patients with head and neck tumor, and (3)clinical anatomy of head and neck region.
(4) Publications

[Original Articles]


10. Masahiro Kishikawa, Atsunobu Tsunoda, Yoji Tanaka, Seiji Kishimoto. Large nasopharyngeal inverted papilloma presenting with rustling tinnitus. Am J Otolaryngol. 35(3); 402-404

[Conference Activities & Talks]

1. Ichikura K, Yamashita A, Matsuoka S, Nakayama N, Ariizumi Y, Suni . Stress coping skill training for patients with head and neck cancer: Interim report of a randomized controlled trial. 19th World Congress of Psycho-Oncology and Psychosocial Academy 2017.08.11 Berlin

2. Ichikura Kanako, Yamashita Aya, Matsuoka Shihoko, Nakayama Nao, Ariizumi Yousuke, Suni Takuro, Sugimoto Taro, Asakage Takahiro, Matsushima Eisuke. Stress coping skill training for patients with head and neck cancer: Interim report of a randomized controlled trial. 19th World Congress of Psycho-Oncology and Psychosocial Academy 2017.08.18 Berlin, Germany

3. Asakage T. Chairman Oral Presentation 16.Central Neck Dissection 1. 2nd Asia-Pacific Society of Thyroid Surgery Okinawa 2017.11.01 Okinawa

4. Ryuhei Okada, Masaru Yokomura, Keiji Oi, Yosuke Ariizumi, Yusuke Kiyokawa, Fuminori Nomura, Akihisa Tasaki, Yumiko Tateishi, Susumu Kirimura, Takahiro Asakage. Medullary thyroid carcinoma detected based on elevated serum procalcitonin levels: A case report. 2nd Congress of Asia-Pacific Society of Thyroid Surgery 2017.11.02
Radiation Therapeutics and Oncology

Professor Ryoichi Yoshimura
Lecturers Kazuma Toda
Research Associates Keiko Nakagawa, Mio Kojima
Hospital Staff members Takuya Nagano (~ Mar.), Ryoko Suzuki (Nov. ~),

(1) Outline

At the Department of Radiation Therapeutics and Oncology, clinical services, research, and education related to radiotherapy for all cancers are undertaken.

(2) Research

Mainly clinical research related to radiotherapy is performed.

(3) Education

Lectures are given to medical students or graduate students, and clinical clerkship is organized. After the students enter our department, comprehensive training is provided at both our department and the Department of Diagnostic Radiology and Nuclear Medicine for 3 years, since the certified radiologist exam is common.

Our department holds a radiation oncology seminar for students and residents with the Department of Radiation Oncology of Juntendo University and Showa University.

Lectures for medical students or graduate students, and clinical clerkship are performed.

(4) Lectures & Courses

Our department teaches students and residents about cancer therapy from the radiation oncologist’s perspective.

Every student/resident of this department aims to be a certified radiation oncologist.

(5) Clinical Services & Other Works

All the staff members are engaged in performing external beam radiation therapy or high-dose-rate or low-dose-rate brachytherapy in the hospital.

A total of 596 patients, including 132 head and neck cancer patients, 126 urological cancer patients, 90 breast cancer patients, 64 lung cancer patients, and 53 esophageal cancer patients, were treated by external beam radiotherapy at our hospital in 2015. Moreover, high-dose-rate brachytherapy was performed in 51 patients with uterine cancer, and low-dose-rate brachytherapy in 58 patients with oral cancer, and in 19 patients with prostate cancer.
(6) Clinical Performances

Our department specializes in low-dose-rate brachytherapy for oral cancer patients.

(7) Publications

[Original Articles]


[Conference Activities & Talks]

1. Kazuma Toda, Akira Toriihara, Keiko Nakagawa, Mio Kojima, Takuya Nagano, Ukihide Tateishi, Ryoichi Yoshimura. Time Dependency of Volume-Based Metabolic Parameters Obtained by Dual-Time-Point TOF-PET/CT for Head and Neck Squamous Cell Cancer. ASTRO 59th annual meeting 2017.09.26 San Diego

(1) Outline

Maxillofacial anatomy section is engaged in lecture and practical course of gross anatomy and dental anatomy in undergraduate school. In graduate school, this section is engaged in morphological studies of hard tissues such as tooth, bone and cartilage.

(2) Research

Research Subjects
1) Structural features of mandibular condylar cartilage.
2) Mechanism of epithelial attachment of junctional epithelium in human gingiva.
3) Comparative histology and embryology of teeth.
4) Observation on the structural features of oral mucous
5) Anatomical names of the structures of human skeletal system.
6) Hyaluronan synthesis in tooth germ.
7) Studies on regeneration of jaw bone.
8) Structural features of dental pulp and extracellular matrix

(3) Education

In Undergraduate school
Lecture for 2nd degree students: Human structure I, II, Dental anatomy, Neuroanatomy,
Practical course for 2nd degree students: Gross Anatomy, Neuroanatomy, Dental Anatomy
Lecture and practical course for 5th degree students: Clinical craniofacial anatomy

In Graduate school
Lecture, seminar and practical course to understand the function of various oral organs in a morphological viewpoint, and to evaluate various vital phenomenon encountered in medical practice.

(4) Lectures & Courses

The main purpose of education in undergraduate school is to understand human structure and function from the viewpoints of gross anatomy. In line with this purpose, we execute lectures of systematic anatomy (osteology, myology, neurology, angiology, splanchnology) and topographic anatomy (craniofacial anatomy). To understand three-dimensional structures of human body, we execute practical course of human gross anatomy.
after completing lectures. In the practical course, we make an effort to make students understand ethics as dental students to be bright future dentists.

The main purpose of education in graduate school is to understand various vital phenomenon, which we encounter in research fields of basic and clinical sciences, from the viewpoints of morphology. In lectures, we teach various techniques to investigate structural features from the standpoints of light and electron microscopy, organ and tissue culture, and molecular biology.

(5) Publications

[Original Articles]


[Books etc]


[Misc]

1. Shunichi SHibata. Anatomy of teeth, jaw bone and oral cavity 2017.07; 37(7); 626-639

[Conference Activities & Talks]

1. Shibata S. Structural features of tooth germ after accelerate mineralization in organ culture system. 2017 International Frontier meeting of Craniofacial and Oral Science 2017.02.11 Japan Women’s University, Tokyo Japan

2. High-Frequency Pulsed Low-Level Diode Laser Therapy Accelerates Wound Healing of Tooth Extraction Socket. High-Frequency Pulsed Low-Level Diode Laser Therapy Accelerates Wound Healing of Tooth Extraction Socket. The 95th General Session & Exhibition of the IADR 2017.03.25 SAN FRANCISCO, CALIF, USA


4. Takahashi M, Kusaka S, Shibata S. Expression of MMPs and TIMPs in the developing condylar cartilage of fetal mouse mandible. The 59th Annual Meeting of Japanese Association for Oral Biology 2017.09.17


9. Shibata S, Takahashi M, Fujikawa K. Gonial bone development with reference to reduction of Meckel's cartilage. JADR 65th annual meeting 2017.11.19 Showa University, Tokyo

10. Fujikawa K, Nakamura M, Shibata S. Expression patterns of Syndecan family in the developing fetal mouse mandibular condylar cartilage. JADR 65th annual meeting 2017.11.19 Showa University, Tokyo

Cognitive Neurobiology

Professor: Masato Taira
Assistant Professor: Narumi Katsuyama
Assistant Professor: Nobuo Usui
Staff Assistant: Takako Kishida
JSPS Research Fellow: Rui Watanabe
Graduate Student:
Eriko Kikuchi(Tachi)
Yuko Imai
Yoko Kono
Kazuya Watanabe
Maki Okada
Hiroaki Tanaka
Takuaki Tani
Research Student:
Yuri Kim
Hitoshi Nanjo
Adjunct Lecturer:
Hisayuki Ojima
Akiko Yamashita
Saneyuki Mizutani

(1) Outline

Higher brain functions have been studied in this laboratory. To explore the individual functions listed below, functional MRI, psychological or psychophysical approach, and traditional electrophysiological recordings together with animal training are applied to animal models such as non-human primates and rodents as well as to human. Our goal is to clarify how perceptual mechanisms underlying higher brain functions are described by the neuronal activity pattern and how cortical wide connectivity is interacted while brain is judging, decision making, extracting biological meanings of sounds including languages.

(2) Research

1. Neural Mechanisms of control of motor behavior.
   Research is aimed at understanding the brain mechanisms of execution and control of the motion and behavior of animals and human.
2. Neuronal mechanisms for perception and cognition.
   Research is aimed at understanding the brain mechanisms of perception and cognition of objects through vision and tactile senses of animals and human.
3. Processing of natural sounds in auditory cortex
   Research is aimed at understanding the brain mechanisms of hearing and vocalization of animals.
(3) **Education**

1. Lectures of unit "Functions of Nervous Systems I (Introduction to Neurophysiology, Motor Functions)"
   Basic knowledge of neurophysiology will be lectured as an introduction together with the motor functions.
2. Lectures of unit "Functions of Nervous Systems II (Perception, Emotion, Instinct, Sleep, Higher functions)"
   A series of lectures will be taught on functions of the sensation, perception, and motion as well as the neural mechanisms of higher brain functions.
3. Lectures of unit "Homeostatic Functions for Life Support".
   Lectures will be taught on the structure of the autonomic nervous system and its regulatory mechanisms in the circulation, respiration, digestion/absorption, humor/body temperature, metabolism, excretion, and internal secretion/reproduction.
4. Lectures of unit "Oral Physiology"
   Lectures will be taught on the structure and function of various somatosensory organs in the oral cavity. Neural regulations of mastication and deglutition as well as the secretion mechanism of saliva will also be learned.
5. Unit of "Practice of Physiology"
   The purpose of the practice is to learn about the physiological mechanisms underlying the normal functions of human body through experiments. The goal is to master the basic experimental procedures, and to experience how to capture and analyze the data in order to draw conclusions.

(4) **Lectures & Courses**

Students are expected to be voluntarily involved in research activity. Brain is an extremely complicated organ in terms of its morphology and functions. Learning of textbook knowledge is mandatory and is followed by capturing up-to-date scientific information through reading published articles. Once the overview of the field in which graduates/undergraduate students are interested in is completed, they will start to be engaged in on-going research topics under the tutelage of laboratory staff. Through this process, students are encouraged to associate their own research interests with the on-going research topics and will learn practically how data can be captured, rearranged and analyzed through real experiments.

(5) **Publications**

**[Original Articles]**

1. Akiko Kamada, Nobuo Usui, Daisuke Yoshino. Relation between impression evaluation and choice behavior for merchandise (2) : An examination of the mere exposure effect. Bulletin of Human Science. 2017.03; (38); 121-127
4. J Horikawa, H Ojima. Cortical Activation Patterns Evoked by Temporally Asymmetric Sounds and Their Modulation by Learning. eNeuro. 2017.05; 4(2);
8. Rui Watanabe, Takahiro Higuchi, Yoshiaki Kikuchi, Masato Taira. Visuomotor effects of body part movements presented in the first-person perspective on imitative behavior. Hum Brain Mapp. 2017.12; 38(12); 6218-6229

[Misc]
1. Taira M. Interface between brain and outside. BRAIN and NERVE. 2017.04; 69(4); 339-345

[Conference Activities & Talks]


Molecular Craniofacial Embryology

(1) Research

1) Molecular mechanisms of mammalian craniofacial development
2) Application of developmental mechanisms to regenerative medicine
3) Identification of tissue stem cells in craniofacial region and molecular mechanism of the mechanism of their stemness
4) Regulation of gene expression in cell growth and differentiation
5) Modulating endochondral ossification of mesenchymal stem cells for bone regeneration

(2) Publications

[Original Articles]


3. Nobuo Tsuchida, Masa-Aki Ikeda, Toshiko Nishimaru, I shinaro, Michele Grieco, Giancarlo Vecchio. FUCA1 is induced by wild-type p53 and expressed at different levels in thyroid cancers depending on p53 status. Int. J. Oncol.. 2017.06; 50(6); 2043-2048


[Misc]


[Conference Activities & Talks]


3. Mya N, Takechi M, Okuhara S, Furutera T, Kume T, Iseki S. Understanding the role of Foxc1 transcription factor in the development of cranial base.. The 57th Annual Meeting of the Japanese Teratology Society 2017.08.26 Faculty of Science and Engineering, Waseda University


Cellular Physiological Chemistry

Associate Professor Ken-ichi Nakahama
Assistant Professor Yasuhiro Yoshimatsu
Junior Associate Professor Hiroshi Fujita, Yasuki Ishizaki, Masao Saito

Research Student : Hong Ding Liu
: Syun Nishihara
: Hiroki Kuwahara
: Syuhei Fukuda
: Hirohito Miki

(1) Outline

In our Lab, we study the role of cell-communication in bone remodeling, cancer and vascular calcification using various techniques, for example, cell culture, molecular biology and mutant mice.

(2) Research

Research Subjects
1. Cell-cell communication and cell functions
2. Bone remodeling and cell communications
3. Cancer and cell communications
4. Mechanism of vascular calcification

(3) Education

For undergraduate students. We have some class in biological chemistry for the second grader.
For graduate students. These students can choose the one of themes in our lab. They have to attend meetings and seminars in our Lab.

(4) Lectures & Courses

Undergraduate students should understand basic biochemistry and physiology under healthy/diseased conditions.
Graduate students are expected to solve the problems by themselves. However, appropriate suggestions will be given by at least three supervisors whenever you want.
(5) Publications

[Original Articles]


2. Rie Norita, Yasuhiro Suzuki, Yutaka Furutani, Kazuki Takahashi, Yasuhiro Yoshimatsu, Katarzyna A Podyma-Inoue, Tetsuro Watabe, Yasufumi Sato. Vasohibin-2 is required for epithelial-mesenchymal transition of ovarian cancer cells by modulating transforming growth factor-β signaling. Cancer Sci.. 2017.03; 108(3); 419-426


5. Ishida T, Yoshida T, Shinohara K1, Cao K, Nakahama K, Morita I, Ohno-Matsui K. Potential role of sirtuin 1 in Müller glial cells in mice choroidal neovascularization PLoS One. 2017.09; 12(9);


[Misc]

1. Yasuhiro Yoshimatsu. Molecular mechanisms governing the formation and maintenance of lymphatic vessels and lymph nodes Experimental Medicine. 2017.01; 387-396

[Conference Activities & Talks]

1. Yasuhiro Yoshimatsu. Transcription Factors and Signals that Regulate Lymphatic Vessel Formation. 2017.02.16 Sapporo

2. Katarzyna Anna Inoue, Kazuki Takahashi, Takumi Mitsuda, Chihiro Takao, Yasuhiro Yoshimatsu and Tetsuro Watabe. Role of TGF-β in the invasiveness of oral carcinoma cells. Joint Symposium of Immunology and Pathological Biochemistry Units 2017.03.08 Tokyo

3. Yasuhiro Yoshimatsu. The role of a network of signaling cascades and transcription factors in the maintenance of endothelial identity. Joint Symposium of Immunology and Pathological Biochemistry Units at TMDU 2017.03.08 Bukyo-ku, Tokyo

4. Yasuhiro Yoshimatsu. Molecular mechanisms by which platelet-derived growth factor signals regulate lymphatic vessel formation. The 41st Annual Meeting of The Japanese Society of Lymphology 2017.06.02 Kagoshima, Kagoshima

5. Yasuhiro Yoshimatsu. ELK3 is a functional regulator of Prox1 in lymphatic endothelial cells. Lymphatic Forum 2017 2017.06.08 The Thorne Auditorium, Northwestern University, Chicago

7. Yasuhiro Yoshimatsu. The role of a network of signaling cascades and transcription factors in endothelial homeostatic maintenance. The 5th Matsumoto Lymphology Conference 2017.08.19


10. Asuka OKITO, Masako Akiyama, Jun HOSOMICHI, Takashi ONO, Ken-ichi NAKAHAMA. Mechanism for transcriptional regulation of osteopontin in osteoblasts. ConBio2017 2017.12.07 Kobe Port island
Biodesign

Professor Kazuo TAKAKUDA
Assistant Professor Hisashi DOI
Mari YUASA
Research Assistants Shukan OKANO
Hiroyuki MASUNO
Noriko NAKAISHI
Graduate Students (Doctoral coarse)
Hiroki IKEDA, Hiroyuki KUSABA,
Hisaya NOMATA, Eiko MARUKAWA

(1) Outline

Biodesign division started in 1951 at establishment of the dental materials research institute as one of the constituting department. Since then, the division changed its name from the department of machinery, the department of precision machinery, the division of mechanics, and the division of biodesign as the institute continued reorganization till the present form of the Institute of Biomaterials and Bioengineering. Although our research work was originally concentrated to cutting tool for dentistry, we are now investigating mechanics of living tissues and biomaterials, biomechanical compatibility of tissues and artificial materials, and the development of artificial organs bearing the mechanical functions in living bodies.

(2) Education

Basic-Clinical Borderless Education
Maxillofacial and Neck Reconstruction

Maxillofacial Surgery

Junior Associate Professor: Satoshi YAMAGUCHI
Assistant Professor: Hiroyuki YOSHITAKE, Yasuyuki MICHI, Kouichi NAKAKUKI, Keiiti MORITA

Hospital Staff: Kunihiro MYO, Nobuyoshi TOMOMATSU, Tomomi SAKUMA, Ryousuke NAGAOKA, Jun SUMINO, Chika MIURA, Madhiko KOSUGI, (from April)Tomoki KANEMARU, Mari SIBATA, Kentaro SUGIYAMA, Natsuko HONDA, Mayuko MARUIWA, Mana TAKAGI

Graduate Student: Reiko HOSHI, Syun NISHIHARA, Erina TONOUCHI, Takasuke INADA Durugu-uu BATBO-RUDO, Eri SONE, Narumi OSIBE, Keiichiro NAKAZATO, Hiroki KATO, Takahiko YAMADA, Yusun KIMU, Katuya HYODO, Daisuke YAMAMOTO, (from April)Eri SIBATA

Student: Tizuko KOMURO, Takahiro KIKUTI, Sinya KOUSAKA, Souiti ROKUSIMA, (from April)

Emeritus Professor: Terno AMAGASA
Clinical professor: Masashi YAMASHIRO
Part-time Lecturer: Kazuki HASEGAWA, Hiroyuki WAKE, Fumiaki SATO, Junichi ISHII, Eizi FUZII, Akiko KOBAYASHI, Yutaka SATO, Yasushi NIINAKA, Takao WATANABE, Testuo SUZUKI, Masayuki YAMANE, Takashi MISHIMAGI, Kazuto KUROHARA, Katuya AIKOU, Yosio OYAMA, Shigehiro ABE, Miho MIZUTANI, Yasuhiro KURASAWA, Chieko MICHIKAWA

(1) Research

Research Subjects
1) Head and Neck Surgery: Innovation of management patients with benign and malignant tumors and cysts in oral and facial region.
2) Reconstructive Surgery: Developing method of correcting jaw, facial bone and facial soft tissue trouble left as the result of removal of disease or previous trauma.
3) Correction of Birth Defects: Improving surgically correction of birth defects of the face and skull, including cleft lip and palate.
4) Dentofacial Deformities and Orthognathic Surgery: Development of new surgical techniques to improving reconstruct and realign the upper and lower jaws.
5) Temporomandibular Joint Disorders: Renewing skills in the diagnosis and treatment due to temporomandibular joint problem.
6) Oral Mucosa Disease: Creation new method with light and color for diagnosis of oral mucosa disease, including leukoplakia and cancer.

(2) Lectures & Courses

Oral and maxillofacial surgery is a surgical specialty involving the diagnosis, surgical treatment and management of defects and injuries related to the function and aesthetics of the face and jaws. In order to practice the full scope of the specialty, oral and maxillofacial surgeons are required education in dentistry, medicine and surgery for regional requirement.

(3) Clinical Performances

Clinical Services
1) Diagnosis, removing and reconstruction of jaw, oral or facial tumor or cyst.
2) Diagnosis and treatment of cleft lip and palate.
3) Treatment of jaw aligned with orthognathic surgery.
4) Therapy of temporomandibular disorder with or without temporomandibular joint surgery.
5) Diagnosis and treatment of oral mucosa disease.
6) Treatment of inflammation in the region jaw and facial trauma.
7) Extraction tooth including wisdom tooth.

(4) Publications

[Original Articles]
1. Yae Ohata, Maiko Tsuchiya, Hideaki Hirai, Satoshi Yamaguchi, Takumi Akashi, Kei Sakamoto, Akira Yamaguchi, Tohru Ikeda, Kou Kayamori. Leukemia inhibitory factor produced by fibroblasts within tumor stroma participates in invasion of oral squamous cell carcinoma. PLoS ONE. 2018.02; 13(2); e0191865

2. Takasuke Inada, Atsushi Tamura, Masahiko Terauchi, Satoshi Yamaguchi, Nobuhiko Yui . A silencing-mediated enhancement of osteogenic differentiation by supramolecular ternary siRNA polyplexes comprising biocleavable cationic polyrotaxanes and anionic fusogenic peptides Biomaterials Science. 2018.02; 6(2); 440-550

[Conference Activities & Talks]
1. NAKAZATO Keiichiro, UZAWA Narikazu, KAYAMORI Kou, TSUCHIYA Maiko, WATANABE Hiroshi, SUMINO Jun, MICHI Yasuyuki, YAMAGUCHI Satoshi. The Change of Metabolic Control Mechanism in the Development and Progress of the Tongue Carcinoma. 2018.01.25 Niigata, Japan
Maxillofacial Orthognathics

Professor Keiji MORIYAMA
Associate Professor Shoichi SUZUKI
Junior Associate Professor Takuya OGAWA
Assistant Professor Michiko TSUJI, Norihisa HIGASHIHORI, Jun MIYAMOTO, Yukiho KOBAYASHI, Yosuke ITO
Clinical Fellow Rina HIKITA, Yuko YASUDA, Kenji OGURA, Yuki TAKAHASHI, Naoki KOUDA, Kohei YAHIRO
Post-doctoral Fellow Chiho KADOTA, Masayoshi UEZONO
Graduate Student Akitsu IKEDA, Taizo HIRATSUKA, Miyu ARAKI, Takeshi OGASAWARA, Hiroyuki KAMIMOTO, Kyoko HIRABAYASHI, Kenta FUNAHASHI, Hideyuki YOSHIZAWA, Aung Bhone Myat, Wu Yu Yun, Kaori KADOKAW, Soonhwa KANG, Sayuri SAITO, Hidekazu MATSUMOTO, Takayuki MIYAZAKI, Teramoto Iida Airy, Nay Myo Min Swe, Phyo Thihla, Nanase IGARASHI, Yumi INAGAKI, Masaki INOUE, Yoshiya KAIJAKA, Yuki NIKI, Thili HLA Myint, Pooktuantong Ornnicha, Teekvanich Chutimont, Badrakhhun Nomin Dulguun
Graduate International Research Student Naomi YAMAMOTO, Sakiko AKIYAMA, Takuya ASAMI, Ayumi SHOJI, Entei RIN, Rie KINOSHITA, Ruriko NAKURA, Syuhei AKIYAMA, Megumi ARIMURA, Asuka TAMURA, Cheng Shih-Wei Eric, Yuri BABA, Kenjiro MATSUMURA, Yukiko KINOSHITA, Chisato TOMINAGA, Daichi HAYAKA, Lin Tun Oo, Thili HLA Myint, Yuki NAKAZAWA, Sahori MATSUMO, Misato HANDA
Visiting Research Scholar Lisa R.Amir
Part-time Lecturer Tatsuo KAWAMOTO, Naoto SUDA, Takaumi SUSAMI, Tamiko TERASHIMA, Yoshiyuki KATO, Yasuo ISHIWATA, Yoshiyuki BABA, Toshimoto TENGAN, Masahiko YOKOZKEI, Shigetoshi HIYAMA, Shigeki TAKAHASHI, Hiroki FUKUOKA, Junichi TAKADA, Ryo MARUOKA

(1) Research

1) Basic and clinical studies of cleft lip and/or palate and other congenital craniofacial conditions
2) Morphological and physiological studies of facial deformity
3) Physiological study about control mechanism of stomatognathic function
4) Functional MRI study in the craniofacial region
5) Clarify the factors of malocclusion with epidemiological technique

(2) Education

The goal of the program of Maxillofacial Orthognathics is to provide information related to craniofacial growth and development, and stomatognathic function in order to develop basic knowledge and skills for the treatment of the patients with a wide variety of malocclusion. It also provides valuable information of diagnosis and treatment planning for orthodontic and orthognathic therapies of the patients with jaw deformities and congenital craniofacial anomalies. Comprehensive care by a team of specialists including maxillofacial surgeons, orthodontists, speech therapists etc. is needed for the treatment of the patients with cleft lip and palate and other craniofacial anomalies. The Graduate Program provides the clinical education of orthodontics as a part of the multi-disciplinary approach for such patients.

(3) Clinical Performances

In the Clinic, we treat a large number of patients presenting a variety of malocclusions to be assigned to group practice in order to gain valuable experience in diagnosis, treatment planning, orthodontic therapy, and patient management. Especially for patients born with cleft lip and/or palate and who need craniofacial and orthognathic surgery, we have clinical meetings and conferences for the comprehensive care through a team approach with maxillofacial surgeons, maxillofacial prosthodontists and speech therapists. We also provide supportive counseling to families who have members with congenital anomalies before the treatment.

(4) Publications

[Original Articles]

1. Yahiro K, Higashihori N, Moriyama K. Histone methyltransferase Setdb1 is indispensable for Meckel’s cartilage development. Biochemical and Biophysical Research Communications. 2017.01; 482(4); 883-888
3. Ikeda M, Miyamoto JJ, Takada JI, Moriyama K. Association between 3-dimensional mandibular morphology and condylar movement in subjects with mandibular asymmetry. American Journal of Orthodontics and Dentofacial Orthopedics. 2017.02; 151(2); 324-334
5. Shiga M, Ogawa T, Ekprachayakoon I, Moriyama K. Orthodontic Treatment and Long-Term Management of a Patient With Marfan Syndrome. The Cleft Palate-Craniofacial Journal. 2017.05; 54(3); 358-367
6. Inagaki Y, Abe M, Inaki R, Zong L, Suenaga H, Abe T, Hoshi K. A Case of Systemic Infection Caused by Streptococcus pyogenes Oral Infection in an Edentulous Patient Diseases. 2017.08; 5(3); 17
8. Shoji-Matsunaga A, Ono T, Hayashi M, Takayanagi H, Moriyama K, Nakashima T. Osteocyte regulation of orthodontic force-mediated tooth movement via RANKL expression. Scientific Reports. 2017.08; 7(1); 8753


[Books etc]


[Conference Activities & Talks]

1. Komazaki Y, Ogawa T, Kataoka K, Baba Y, Moriyama K. Postoperative changes of the maxilla after distraction osteogenesis in cleft palate patients - Comparison between internal device and external device. 13th International Cleft Congress 2017.02.08 Chennai, India

2. Ogawa T. Maxillary distraction osteogenesis in CLP patients with severe maxillary deficiency: Methodology, timing and long term follow up. 13th International Cleft Congress 2017.02.08 Chennai, India

3. Miyamoto J, Tamura A, Ogura K, Ogawa T, Morita K, Moriyama K. A case of UCLP treated by maxillary distraction osteogenesis in late stage of pubertal growth. The 41st Annual Meeting of Japanese Cleft Palate Association 2017.05.18 Tokyo


5. Ogawa T, Handa M, Uezono M, Komazaki Y, Tsuji M, Moriyama K. A survey of orthodontic treatment of rare disease with cleft lip and/or palate. The 41st Annual Meeting of Japanese Cleft Palate Association 2017.05.18 Tokyo


11. Yahiro K, Higashiori N, Moriyama K. The effects of histone methyltransferase Setdb1 on Meckel’s cartilage development via BMP signals. The 76th Annual Meeting of the Japanese Orthodontic Society 2017.10.18 Hokkaido


19. Ogawa T, Yamagushi S, Moriyama K. Surgical orthodontic treatment for a unilateral anterior crossbite case using maxillary dentoalveolar distraction osteogenesis. The 76th Annual Meeting of the Japanese Orthodontic Society 2017.10.18 Hokkaido


23. Lin W, Tsuji M, Shoji A, Higashihori N, Moriyama K. Clinicostatistical investigation on orthodontic patients with impacted teeth at TMDU for the past 10 years. The 76th Annual Meeting of the Japanese Orthodontic Society 2017.10.18 Hokkaido


25. Miyamoto J. Human brain activity related to oral function. XXV International Congress of the Academia Mexicana de Ortodoncia 2017.11.16 Mexico City, Mexico

26. Moriyama K. Orthodontic Treatment for Adolescent Patients with Mandibular Prognathism. XXV International Congress of the Academia Mexicana de Ortodoncia 2017.11.16 Mexico City, Mexico
27. Moriyama K. An orthodontic perspective of long-term care for cleft lip and palate and its related congenital anomalies patients. XXV International Congress of the Academia Mexicana de Ortodoncia 2017.11.16 Mexico City, Mexico

28. Moriyama K. Some Considerations in Orthodontic Treatment for Class III Patients. XXV International Congress of the Academia Mexicana de Ortodoncia 2017.11.16 Mexico City, Mexico

29. Moriyama K. Non-surgical and Surgical Orthodontic Treatment for Adult Patients with Mandibular Prognathism. XXV International Congress of the Academia Mexicana de Ortodoncia 2017.11.16 Mexico City, Mexico


Maxillofacial Prosthetics

2017 April

Professor
TANIGUCHI Hisashi

Junior Associate Professor
SUMITA Yuka

Assistant Professor
HATTORI Mariko
OTOMARU Takafumi

Contract Assistant Professor
HATANO Noriko

Clinical Staff
HARAGUCHI Mihoko
MURASE Mai
KANAZAKI Ayako

Graduate Student
YANAGI Ayaka
SAID Mohamed Moustafa
ASWEHLEE Amel Mohamed
LI Na
KAMIYANAGI Ayuko
KEIMU Shajidan
YEERKEN Yesiboli
AWUTI Shater
FUJITA Haruka

Part-time Lecturer
SATO Iwao
NOMURA Koji
ELBASHI Mahmoud Ellarousi

Part-time Special Student
WATANABE Mao
ZHANG Manjin
LIU Rongguang

Speech-Language-Hearing Therapist
MIBU Michiko
Maxillofacial and Neck Reconstruction

(1) Outline

Department of Maxillofacial Prosthetic is the special unit of the prosthodontic and/or prosthetic treatment for patients with defects in oral and/or maxillofacial regions. The main objective of this course is to provide students with opportunity to gain sound understanding of the restoration of functional and esthetic disorders of oral and/or maxillofacial areas that are caused by congenital developmental or acquired diseases by means of the high-advanced dental and medical cares.

(2) Research

Our department is the special unit for the prosthodontic treatment for patients with congenital or acquired defects in head and neck regions. The main goal of the research is to establish a novel theory and feedback it to the clinic to improve the quality of life of each patient. In this respect, we are focusing on several projects.

Diagnosis of functional impairment in patients with a maxillofacial defect
Treatments for functional rehabilitation of patients with a maxillofacial defect
Masticatory evaluation in patients with a maxillofacial defect
Speech evaluation in patients with a maxillofacial defect
Development of new materials for facial prosthesis

(3) Publications

[Original Articles]


8. Yanagi A, Murase M, Sumita YI, Taniguchi H. Investigation of nutritional status using the Mini Nutritional Assessment-Short Form and analysis of the relevant factors in patients with head and neck tumour. Gerodontology. 2017.06; 34(2); 227-231

10. Said M, Otomaru T, Yeerken Y, Taniguchi H. Masticatory function and oral health-related quality of life in patients after partial maxillectomies with closed or open defects. J Prosthet Dent. 2017.07; 118(1); 108-112


13. Elbashti ME. Welcome to IJMP, a new journal with new value. Int J Maxillofac Prosthetics. 2017.08; 1(1); 1


15. Sumita YI. Key points to success in maxillofacial prosthetic treatment. Ann Jpn Prosthodontic Soc. 2017.10; 9(4); 339-344


19. Li N, Otomaru T, Taniguchi H. Sleep quality in long-term survivors of head and neck cancer: preliminary findings. Supportive Care in Cancer. 2017.12; 25(12); 3741-3748


[Conference Activities & Talks]
1. Haraguchi M, Tachikawa N, Sumita YI, Taniguchi H. Prosthetic rehabilitation for 3 patients with bilateral cleft lip and palate. The 41st annual meeting of Japanese Cleft Palate Association 2017.05.19 Tokyo (Japan)

2. Otomaru T, Sumita YI, Hatano N, Haraguchi M, Murase M, Kanazaki A, Taniguchi H. Prosthetic treatment in a left cleft lip and palate patient with fistula; A case report. The 41st annual meeting of Japanese Cleft Palate Association 2017.05.19 Tokyo (Japan)

3. Morita K, Mibu M, Otomaru T, Shimazaki K, Ogawa T, Tachikawa N, Miyashin m, Ono T, Moriyama K, Taniguchi H, Harada H. Oral and Maxillofacial Malformation Clinic of Tokyo Medical and Dental University Dental Hospital. 2017.05.19 Tokyo (Japan)
4. Elbashti ME, Aswehlee A, Hattori M, Sumita YI, Taniguchi H. Effect of prosthetic rehabilitation on geometrical face asymmetry in mandibulectomy patients. 6th Triennial Congress of Advancing Digital Technology in Head and Neck Reconstruction 2017.05.31 Amiens (France)

5. Elbashti ME, Aswehlee A, Sumita YI, Hattori M, Taniguchi H. The role of portable documentation format in three-dimensional interactive visualization in maxillofacial prosthetics. 6th Triennial Congress of Advancing Digital Technology in Head and Neck Reconstruction 2017.05.31 Amiens (France)

6. Aswehlee A, Hattori M, Elbashti M, Sumita YI, Taniguchi H. Geometrical evaluation of prosthetic rehabilitation effect on facial asymmetry of unilateral maxillectomy patients. The 34th annual meeting of Japanese Academy of Maxillofacial Prosthetics 2017.06.02 Tokyo (Japan)

7. Murase M, Sumita YI, Taniguchi H. A case report of functional rehabilitation by maxillofacial prosthesis for the multiple disabilities patient after total glossectomy. The 34th annual meeting of Japanese Academy of Maxillofacial Prosthetics 2017.06.02 Tokyo (Japan)

8. Watanabe M, Otomaru T, Li N, Hideshima M, Taniguchi H. Clinical follow-up of obstructive sleep apnea applied with an oral appliance in a patient with maxillectomy. The 34th annual meeting of Japanese Academy of Maxillofacial Prosthetics 2017.06.03 Tokyo(Japan)

9. Haraguchi M, Tachikawa N, Michi Y, Harada H, Sumita YI, Taniguchi H. The different outcome of dental implant treatment in 3 segmental mandibulectomy patients with reconstruction by scapula osteocutaneous flap. The 41st annual meeting of Japan Society for Head and Neck Cancer 2017.06.08 Kyoto(Japan)

10. Hoshihai T, Otomaru T, Oki M, Shinozuka O, Taniguchi H. Modal analyses of the maxillary dentition with maxillary cast obturator prostheses comparing different retainer types of metal frameworks. The 126th annual meeting of the Japan Prosthodontic Society 2017.07.01 Kanagawa(Japan)


14. Sumita YI, Namba T, Kamarul HK, Kamiyanagi A, Hattori M, Ino S, Taniguchi H. Obturators to facilitate speech and swallowing in a maxillectomy patient with dementia and cerebral infarction. 4th Joint Meeting of the International Society for Maxillofacial Rehabilitation and the American Academy of Maxillofacial Prosthetics 2017.10.28 San Francisco(USA)


29. Fujita H. Changes of Patient Number in 35 yrs and Maxillofacial Defect Patients with Dementia. The Joint Egyptian-Japanese Scientific Cooperation Seminar 2017.11.27 Cairo (Egypt)

Cell Biology

Professor : Takao Nakata  
Junior Associate Professor : Tomohiro Ishii  
Assistant Professor : Toshifumi Asano  
Assistant Professor : Hironori Inaba  
Technical Staff : Satoko Nakamura

(1) Outline
We started a new laboratory from April 2009. We are interested in the cellular responses to spatio-temporal activation of signaling molecules. For this purpose, we took synthetic approaches combined with optogenetics. We introduce the photo switches into cells, and analyze signaling systems quantitatively. Research will be conducted by using molecular biology, molecular genetics, cell biology, theoretical biology, and live-imaging techniques.

(2) Research
We are studying cell signaling using optogenetics. We made photo-switch of various signaling proteins and introduced them into cells. Parts of the cells were stimulated by blue lasers. The photo-switches are activated locally within the cells and we observe the cell phenotypes by time-lapse microscope using these techniques. We can understand molecular mechanisms of cell signaling in spatio-temporal fashion and also can manipulate cellular conditions using these switches.

(3) Education
We teach histology and cell biology to 2nd year medical students. The courses are composed of sets of lecture and laboratory study of tissues and organs. Our goal in undergraduate course is to provide students with fundamental knowledge and skill to analyze microscopic samples of normal human body. In new curriculum, lecture provide students information on fine structure and hints or laboratory work. This helps the students to sketch the tissue in their laboratory work. The aim of our lecture is to provide fundamental knowledge of human tissues and organ to understand clinical lectures. In laboratory work we adopt classical sketch of tissues because we believe it shows the ability of students to search the representative area and extract essential structure. Evaluation depends on paper test, sketch and laboratory test. In cell biology course we start a little bit advanced lectures such as cell death and cell cycle because we avoid to teach the same contents that they have learned in the past year biology course. We also provide more stimulative lectures in later half of the course such as autophagy, zebrafish genetics and mathematical model.

(4) Publications
[Original Articles]

[Misc]

[Conference Activities & Talks]
1. Tomohiro Ishii. Novel optogenetic tool controlling intracellular calcium signals. Faculty Development 2017 2017.01.07 Tokyo Medical and Dental University

2. Toshifumi Asano, Takao Nakata. Activity-dependent modulation of myogenic differentiation by dynamic optical control. The 16th Congress of the Japanese Society for Regenerative Medicine 2017.03.07 Sendai International Center

3. Takao Nakata. What we can do using Optogenetic tools elucidation of functional difference between CDC42 and RAC1. The 122nd Annual Meeting of The Japanese Association of Anatomists 2017.03.28 Nagasaki University

4. Takao Nakata. Optogenetics of cell signaling-Ca2+, cAMP, RhoGTPases, PI3K, what we can say with these tools?. 8th Asia and Oceania Conference of Photobiology (AOCP 2017) 2017.11.15 Seoul, Korea


[Awards & Honors]
1. TMDU Faculty of Medicine Excellence in Research (Tomohiro Ishii), Tokyo Medical and Dental University, 2017.01
Medical Biochemistry

Professor Yutaka Hata
Assistant Professor Hiroaki Iwasa
Assistant Professor Kyoko Arimoto-Matsuzaki
Assistant Professor Junichi Maruyama
Other two staffs

(1) Research

1) The biological and chemical approach to study the Hippo pathway that controls cell proliferation, cell differentiation, and cell death.
2) Versatile roles of the tumor suppressor RASSF proteins
3) Discovery and development of chemical compounds that suppress cancer stemness and metastasis
4) Discovery and development of chemical compounds that facilitate myogenesis and prevent muscle atrophy
5) Development of mouse models mimicking human progeria syndromes
6) Study of health life span in Caenorhabditis elegans

(2) Education

1: Undergraduate course
We organized the course of Biochemistry for the undergraduate students.
2: Master course
We organized the course of Biochemistry for the master students.
3: Others
We gave a lecture about metabolism of cancer cells.
We gave a lecture entitled "How is the life of human maintained?" for the students of Tokyo University of Foreign Studies.

(3) Lectures & Courses

1) Undergraduate
We organize the course, “Medical Biochemistry”. The students are requested through these courses to obtain a comprehensive integrated knowledge of human biochemistry, which is important to understand how health is maintained and which molecular and biochemical events cause human diseases and underlie the rational treatments.
2) Graduate and others
We are studying the signaling pathway that regulates cell proliferation, cell differentiation, cell polarity, and cell death. This pathway is well conserved from fly to human. The mutations of the components lead to oncogenesis and organ malformation. Several recent studies suggest that this pathway is implicated in inflammation and cell differentiation such as adipogenesis, osteogenesis, and keratinocyte differentiation. The pathway plays an important role in various human diseases and could be a new therapeutic target. We give lectures about
our current studies to graduate students and others, and provide graduate students with the opportunity to participate in them.

(4) Publications

[Original Articles]


[Books etc]


2. Xu X, Kodaka M, Iwasa H, Hata Y. Encyclopedia of Signaling Molecules MAGI2/S-SCAM. Springer,


[Misc]

1. Yutaka Hata, Takeru Sawada. Hippo tumor suppressor pathway Journal of Molecular Targeted Therapy for Cancer. 14(4); 10-16
Joint Surgery and Sports Medicine

(1) Research

1. Development and establishment of isolation and expansion of mesenchymal stem cells
2. Research of biological characteristics of mesenchymal stem cells
3. Development and improvement of treatment method of articular cartilage defect with mesenchymal stem cells
4. Development of treatment strategy to joint structure injuries with mesenchymal stem cells
5. Development of artificial cartilage and bone
6. Development of novel agents related to bone and cartilage metabolism
7. Genetical approach to bone and cartilage metabolism
8. Clarifying mechanism and control of post-injury and postoperative inflammation with tissue fibrosis
9. Clarifying mechanism of joint pain with novel treatment strategy
10. Genetic approach to secondary hip osteoarthritis
11. Novel treatment strategy for cufftear

(2) Lectures & Courses

We are working with the Orthopaedic and Spinal Surgery as a Department of Orthopaedic Surgery of University Hospital. The doctors start to have education of orthopedic surgery as a member of the department from the staffs of the department of Orthopaedic Surgery according to the orthopaedic education and training program after completing the two-year fundamental education and training program as a junior resident. They experience a lot of traumatic patients and deepen their basic orthopaedic skills for two-year junior orthopaedic training in one of the branch hospitals every year. They expand their skills and obtain orthopaedic specialty educations in the advanced two-year education and training program. After completing a six-year educational program of the orthopaedic surgery, they are recommended to apply to the orthopedic specialist form the Japanese Orthopaedic
Association. They usually apply to enter the graduate school program after 4 or 5 years of clinical experience. We encourage not only orthopedic doctors but doctors of other specialty, veterinarian doctors and physical therapists, etc to work with us.

(3) **Clinical Services & Other Works**

Treatment for sports injuries
Prevention, conservative treatment and rehabilitation for sports injuries
Anatomic double-bundle anterior cruciate ligament (ACL) reconstruction for ACL injuries
Surgical treatment for knee multiple ligament injuries
Surgical treatment for meniscal injuries to restore meniscal function
Regenerative medicine for unrepairable meniscus and cartilage injuries

Treatment for osteoarthritis (OA)
Conservative approaches to early OA
Joint-sparing surgeries such as osteotomies for moderate OA
Total arthroplasties for severe OA

Clinical researches and clinical results for above-mentioned approaches have been presented at both domestic and international congresses, as well as reported in Japanese and English articles.

(4) **Clinical Performances**

Sports injuries
We have been performing double-bundle ACL reconstruction since 1994 as a pioneer, and reported good clinical outcomes regarding knee stability, ratio of return to sports and patients' satisfaction. As for meniscal surgeries, we have been trying to repair as much as possible to restore meniscal function. In addition, we have developed a novel surgical procedure to restore meniscal function for patients with post-meniscectomy and discoid meniscus. We have also analyzed mechanisms and preventive methods for ACL injuries, and first in the world clarified a detailed ACL injury mechanism. Based on the findings, various approaches to ACL injury prevention and rehabilitation after ACL reconstruction is being conducted.

Arthroplasties
We have developed a new total knee system called Actiyas, named after the combination of active and healed ("iyas" in Japanese), which is specifically designed for Japanese. In order to develop this, we analyzed Japanese bone morphology, and this system is designed for more functional and 'active' motion without knee pain, and eventually patients to be 'healed'. Ceramic is used for the femoral implant, by which we can expect lesser implant wear, resulting in better long-term results. We perform simultaneous bilateral arthroplasties for Bilateral OA patients, helping them earlier return to daily life.

Regenerative medicine for cartilage and meniscus injuries using synovial stem cells
Based on numerous basic researches performed in our laboratory, we started stem cell therapy for cartilage injuries using synovial stem cells since April 2008. In this therapy, we take synovium from patients at day surgery, culture synovial stem cells at the cell processing center in our university, and transplant them arthroscopically. The safety and effectiveness had been already confirmed. In addition, we also started a clinical trial of synovial stem cell transplantation for unrepairable meniscal tear since August 2014.

(5) **Publications**

[Original Articles]

1. Ryusuke Saito, Takeshi Muneta, Nobutake Ozeki, Yusuke Nakagawa, Mio Udo, Katsuaki Yanagisawa, Kunikazu Tsuji, Makoto Tomita, Hideyuki Koga, Ichiro Sekiya. Strenuous running exacerbates knee cartilage erosion induced by low amount of mono-iodoacetate in rats. BMC Musculoskelet Disord. 2017.01; 18(1); 36
2. Etsuko Matsumura, Kunikazu Tsuji, Keiichiro Komori, Hideyuki Koga, Ichiro Sekiya, Takeshi Muneta. Pretreatment with IL-1 \(\beta\) enhances proliferation and chondrogenic potential of synovium-derived mesenchymal stem cells. Cytotherapy. 2017.02; 19(2); 181-193

3. Wei Ji, J Bolander, YC Chai, H Katagiri, M Marechal, F Luyten. Toward Advanced Therapy Medicinal Products (ATMPs) Combining Bone Morphogenetic Proteins (BMP) and Cells for Bone Regeneration Bone Morphogenetic Proteins: Systems Biology Regulators. 2017.03; 127-169


7. Katagiri Kenta, Yu Matsukura, Takeshi Muneta, Nobutake Ozeki, Mitsuru Mizuno, Hisako Katano, Ichiro Sekiya,. Fibrous synovium releases higher numbers of mesenchymal stem cells than adipose synovium in a suspended synovium culture model. Arthroscopy. 2017.04; 33(4); 800-810


9. Mikio Shioda, Takeshi Muneta, Kunikazu Tsuji, Mitsuru Mizuno, Keiichiro Komori, Hideyuki Koga, Ichiro Sekiya. TNF \(\alpha\) promotes proliferation of human synovial MSCs while maintaining chondrogenic potential. PLoS ONE. 2017.05; 12(5); e0177771


12. Yuji Kohno, Mitsuru Mizuno, Nobutake Ozeki, Hisako Katano, Keiichiro Komori, Shizuka Fujii, Koji Otabe, Masafumi Horie, Hideyuki Koga, Kunikazu Tsuji, Mikio Matsumoto, Haruka Kaneko, Yuji Takazawa, Takeshi Muneta, Ichiro Sekiya. Yields and chondrogenic potential of primary synovial mesenchymal stem cells are comparable between rheumatoid arthritis and osteoarthritis patients. Stem Cell Res Ther. 2017.05; 8(1); 115

13. R Takada, T Jinno, D Koga, K Miyatake, T Muneta, A Okawa. Comparison of wear rate and osteolysis between second-generation annealed and first-generation remelted highly cross-linked polyethylene in total hip arthroplasty. A case control study at a minimum of five years. Orthop Traumatol Surg Res. 2017.06; 103(4); 537-541


15. Shimpei Kondo, Takeshi Muneta, Yusuke Nakagawa, Hideyuki Koga, Toshifumi Watanabe, Kunikazu Tsuji, Shinichi Sotome, Atsushi Okawa, Shintji Kiuchi, Hideo Ono, Mitsuru Mizuno, Ichiro Sekiya. Transplantation of autologous synovial mesenchymal stem cells promotes meniscus regeneration in aged primates. J. Orthop. Res.. 2017.06; 35(6); 1274-1282

17. Eriko Grace Suto, Yo Mabuchi, Nobuharu Suzuki, Koji Suzuki, Yusuke Ogata, Miyu Taguchi, Takeshi Muneta, Ichiro Sekiya, Chihiro Akazawa. Prospectively isolated mesenchymal stem/stromal cells are enriched in the CD73(+) population and exhibit efficacy after transplantation. Sci Rep. 2017.07; 7(1); 4838


19. Hideyuki Koga, Toshifumi Watanabe, Masafumi Horie, Hiroki Katagiri, Koji Otabe, Toshiyuki Ohara, Mai Katakura, Ichiro Sekiya, Takeshi Muneta. Augmentation of the pullout repair of a medial meniscus posterior root tear by arthroscopic centralization 2017.08; 6(4); 1335-1339


27. Toshifumi Watanabe. Intraoperative Joint Gaps Affect Postoperative Range of Motion in TKAs With Posterior-stabilized Prostheses

28. Toshifumi Watanabe. Knee Kinematics in Anterior Cruciate Ligament-Substituting Arthroplasty With or Without the Posterior Cruciate Ligament

[Misc]

1. Hideyuki Koga, Lars Engebretsen, Freddie H Fu, Muneta Takeshi. Revision anterior cruciate ligament surgery: state of the art. J ISAKOS. 2017.02; 2(1); 36-46

[Conference Activities & Talks]

1. Hiroko Oeki, Takeshi Tateishi, Hideyuki Koga, Daisuke Hatsushika, Takashi Ogiuchi. Proximal Fifth Metatarsal Stress Fractures: Screening and Treatment for Incomplete Fractures. 5th IOC World Conference on Prevention of Injury & Illness in Sport 2017.03.16

2. Hideyuki Koga. ACL injury mechanisms and its prevention in basketball and handball. 5th IOC World Conference on Prevention of Injury & Illness in Sport 2017.03.16

— 101 —
3. Toshifumi Watanabe, Takeshi Muneta, Hideyuki Koga, Masafumi Horie, Koji Otabe, Toshiyuki Ohara, Kaori Nakamura, Mai Katakura, Ichiro Sekiya. Post-cam Design and Contact Stress on Tibial Posts in Total Knee Prostheses: Comparison between a Rounded and a Squared Design. Orthopaedic Research Society 2017.03.19 San Diego, CA, USA


9. Hideyuki Koga. ACL injury mechanisms and its prevention in basketball and handball. 5th IOC World Conference on Prevention of Injury & Illness in Sport 2017.04.27


11. Hiroki Katagiri, Mendes LF, Luyten FP. Definition of a Critical Size Osteochondral Knee Defect and its Negative Effect on the Surrounding Articular Cartilage in the Rat. 5th BSTE 2017.05.04 Belgium

12. Hiroko Ueki, Tomohiko Tateishi, Saisei AN, Daisuke Hatsushika, Hideyuki Koga, Takashi Ogiuchi. PROXIMAL FIFTH METATARSAL STRESS FRACTURES: SCREENING AND TREATMENT FOR INCOMPLETE FRACTURES. XXVI International Conference on Sports Rehabilitation and Traumatology 2017.05.13 Barcelona, Spain


14. Ryohei Takada, Tetsuya Jinno, Kazumasa Miyatake, Takeshi Muneta, Atsushi Okawa. Comparison Of Wear Rate And Osteolysis Between Second-Generation Annealed And First-Generation Remelted Highly Cross-Linked Polyethylene In Total Hip Arthroplasty. 18th EFORT 2017.05.31 Vienna, Austria

15. Hideyuki Koga, Takao Minami, Ichiro Sekiya, Takeshi Muneta. Impact of posterior root tear on knee instability in anterior cruciate ligament injured patients. 11th ISAKOS Congress 2017.06.04

16. Hideyuki Koga, Toshifumi Watanabe, Masafumi Horie, Hiroki Katagiri, Koji Otabe, Toshiyuki Ohara, Mai Katakura, Ichiro Sekiya, Takeshi Muneta. Arthroscopic Centralization of an Extruded Meniscus and Its Application to Knee Osteoarthritis to Restore Knee Function. 9th JOSKAS 2017.06.22 Sapporo, Japan

17. Hideyuki Koga. Report of JOSKAS-SIGASCOT Fellowship 2016. 9th JOSKAS 2017.06.22

19. Mai Katakura, Kenji Hirohata, Kazuyoshi Yagishita, Hideyuki Koga. Discoid lateral meniscus tear in dancers: report of two cases. 27th IADMS (Annual Conference for International Association for Dance Medicine and Science) 2017.10.12 Houston, Texas, USA
Biostructural Science

Associate Professor: Makoto TABATA
Technician: Makoto SUGIURA
Secretary: Tomoko YAMAMOTO
Graduate Student: Takafumi NAKANO
Eri USHIMURA (April-)
Momoko SAKAGUCHI (April-)

(1) Outline

Section of biostructural science is the inheritor of the laboratory of Oral Anatomy II, then we focus understanding of the mechanism of tooth development, tooth cell differentiations, and tooth evolution using methods of histology, cell biology, and molecular biology. We also teach three courses of histology for the second grade of dental student, and attend to the preparation works of gross anatomy.

(2) Research

The study of the mechanisms of dental formation and their evolution is the central focus of our research. Followings are rough description of current research subjects in our laboratory.

1) Research of Tooth Germ Development
2) Research of Ameloblast Differentiation & Function
3) Research of Fish Scales & Teeth
4) Space Experiments using Fish
5) Comparative Morphology of the Tooth

(3) Lectures & Courses

We are inheritor of the laboratory of Oral Anatomy II, then we involved in the education of histology, embryology, and oral histology.

In the first place, anatomy and histology is the study to learn the structure, the name, and the function of "HUMAN BODY". Then the subject histology is not able to separate from subject anatomy, relate to physiology, pathology, and embryology and further become to be the fundamentals of clinical subjects. So we carry out of our subjects, with an awareness of the relationships between histology and other subjects.

On the curriculum of the 2nd grade of dental students, lectures of histology contains practical histology using tissue sections and microscopy. This skills work is a good opportunity to know the variation and the finesse of the human body in histology.
(4) Publications

[Conference Activities & Talks]


2. Shunsuke Fukuba, Tatsuya Akizuki, Shu Hoshi, Takanori Matsuura, Ammar Shujaa Addin, Munehiro Okada, Yasuhiko Tabata, Makoto Tabata, Yuichi Izumi. Comparison between different isoelectric point of biodegradable gelatin/\(\beta\)-tricalcium phosphate sponge using recombinant human fibroblast growth factor-2 for ridge augmentation. 2017.12.15
Pharmacology

Staffs and Students (April, 2017)

Assistant Professor Yukihiko TAMURA
Technologist Mariko TAKAHASHI

Researchers
Nobuyoshi TOMOMATSU (Maxillofacial Surgery)
Yasuhiro SHIMIZU (Orthodontic Science)
Tomoki UEHARA (Pediatric Dentistry)
Yuki ARAI (Removable Prosthodontics)

Graduate Students
Md. Haque Bhuyan ZAHIRUL
Kenya YONEDA (Regenerative Dental Medicine)
Eri SONE (Maxillofacial Surgery)
Hisami OKAWARA (Removable Prosthodontics)
Michiko OZAWA
Shigeki NAGAHIRO (Pediatric Dentistry)

Lecturers
Etsuko TAKAHASHI
Akira NIFUJI
Nozomi HASEGAWA
Eiichi MURASE
Yoshiiro WAKI
Hiroyuki SETO
Toshimi SATO
Genki KATO
Setsuko MISE
Kiichi NONAKA
KHAN Md Abudulla Al Masud

(1) Research

Research subjects
1) Pharmacological analyses of formation and resorption on bones and teeth
2) Identification of a new therapeutic target for hard tissue-related diseases
3) Translational research for hard tissue regeneration
4) Interdisciplinary research toward the application of peptide drug
5) Analyses of drug side effects appeared at oral tissues
(2) Lectures & Courses

Purpose of Education
Pharmacology is situated between the basic and clinical sciences and is important for dental students. There is a growing demand on the dental clinicians to know huge knowledge of drugs and how to use them for patients. For these purpose, the first lecture is aimed to teach the scientific aspects of pharmacology and how drugs act on the various organ system. The second lecture deals with drugs of medical and dental fields and the last with drugs of special importance of dentistry. Dental students learn the principle of pharmacology through laboratory practice. Following these learning, they must acquire an adequate background for drug use in general practice.

(3) Publications

[Original Articles]


4. Toru Takemoto, Yuji Kabasawa, Yusuke Higuchi, Yasuhiro Tabata, Kazuhiro Aoki, Yukihiko Tamura, Hiroyuki Harada. Combination of the RANKL-binding peptide W9 and bFGF induces bone regeneration in the rat calvarial defect model. Dent Oral Craniofac Res. 2017.12; 4(3); 1-7

[Conference Activities & Talks]

1. Kazuhiro AOKI. Roland gave me a seed of my research. The 59th Annual Meeting of Japanese Association for Oral Biology 2017.09.16 Matsumoto Dental University

Connective Tissue Regeneration

Outline

Our group is interested in the restoration of damaged connective tissue. In general, connective tissue is characterized by the presence of abundant extracellular matrix, and its function is highly dependent on the properties of extracellular matrix. Therefore, to restore connective tissue normal, it is essential for us to understand the behavior of extracellular matrix molecules. So, we pursue research on the molecular mechanisms underlying the formation and maintenance of extracellular matrix in connective tissues.

Research

Currently, we are engaged in the following research subject.
1. Study on the mechanisms that regulate the expression of type II collagen and aggrecan in chondrocytes.
2. Study on transcription factors necessary for the maintenance of chondrogenic phenotype.

Education

We give a lecture on molecular biology in general and laboratory exercise for undergraduate students. Also, in our graduate course, we offer lectures on the synthesis and formation of extracellular matrix focusing on cartilage tissue.

Lectures & Courses

We provide education based on the belief that an integrated and organized connection of various knowledge is important to understand life phenomena.

Publications

[Original Articles]
1. Miyazaki Yumiko, Horie Akihito, Sato Yukiyasu, Tani Hirohiko, Ueda Masashi, Okunomiya Asuka, Matsumura Noriomi, Shinomura Tamayuki. Effects of versican V1 on human embryo attachment in an in vitro implantation model ACTA OBSTETRICA ET GYNAECOLOGICA JAPONICA. 2017.02; 69(2); 633


[Conference Activities & Talks]

1. Tamayuki Shinomura. Col2a1 and Agc1 gene expressions regulated by different growth factors are mediated via different enhancer elements. Gordon Research Conference on Cartilage Biology & Pathology 2017.04.02 Renaissance Tuscany II Ciocco, Lucca, Italy
Bio-chemistry

Professor Testuro Watabe
Associate Professor Miki Yokoyama
Junior Associate Professor Yasuhiro Kumei
Assistant Professor Katarzyna Anna Podyma-Inoue
Technical staff Megumi Naito, Kazue Terasawa
Part-time Lecturer Zeredo, Jorge Luis Lopes, Akira Asari
Graduate student Kazuki Takahashi, Akihiko Inagawa, Takumi Matsuda

(1) Outline

Since cancer is the leading cause of death in Japan, we need to develop novel strategies to cure it. Tumor consists of not only cancer cells but also the non-cancerous cells including fibroblasts, immune cells and cells that comprise the blood and lymphatic vessels. We aim to elucidate the mechanisms how cancer cells become malignant by the various cytokines in cancer microenvironment in order to develop novel therapeutic strategies targeting multiple components of cancer microenvironment.

(2) Research

(1) Understanding the molecular mechanisms underlying endothelial-mesenchymal transition (EndMT)
Endothelial cells undergo differentiation into mesenchymal cells during not only various physiological processes including heart valve formation but also pathological processes including cancer progression, heart failure and diabetes. However, the molecular mechanisms that regulate such endothelial-mesenchymal transition (EndMT) remain to be elucidated. We aim to study the molecular mechanisms underlying EndMT in order to identify novel targets and attempt to develop therapeutic strategies for EndMT-related diseases.

(2) Elucidation of the molecular mechanisms underlying tumor angio- and lymphangiogenesis
Tumor angiogenesis and lymphangiogenesis are key features of tumor progression and metastasis. While multiple signaling pathways have been implicated in the formation of blood and lymphatic vessels, the molecular mechanisms underlying these processes have not yet fully elucidated. Recent findings revealed that members of the transforming growth factor-β (TGF-β) family play pivotal roles in angiogenesis and lymphangiogenesis, and that abnormalities in TGF-β family signaling lead to development of certain vascular disorders, including hereditary hemorrhagic telangiectasia (HHT), pulmonary arterial hypertension, Marfan syndrome and Loeys-Dietz syndrome. We attempt to elucidate the molecular mechanisms how TGF-β family signals regulate antiogenesis and lymphangiogenesis in tumor microenvironment.

(3) Understanding the molecular mechanisms underlying metastasis of cancer cells
Epithelial-mesenchymal transition (EMT) plays important roles in various physiological and pathological processes, and is regulated by signaling pathways mediated by cytokines including TGF- β. Using various types of in vitro cultured oral carcinoma cells and in vivo systems, we aim to identify the molecules involved in the acquisition of invasive properties of cancer cells, in order to develop novel therapeutic strategies.

(4) Elucidation of the role of LAMP-1/2 proteins in the lysosomal intracellular degradation system
Lysosomes are intracellular organelles, containing various hydrolytic enzymes, essential for maintaining cell
homeostasis such as acquisition of energy and nutrients, biological defense, removal of unnecessary substances. In recent years it has also been found that lysosomes sense the state of energy acquisition of cells and decide whether the cells proliferate or gain nutrition. Lysosomal dysfunction clinically results in progressive and severe effects, especially notable in the nervous system, bone, connective tissue.

Lysosome-associated membrane protein-1/2 is the abundant membrane-spanning glycoprotein present in lysosomal membranes. Most of the proteins of LAMP-1 and LAMP-2 are present on the luminal side of lysosomes, both of which are composed of two homologous domains. However, LAMP-2 deficient mice exhibit a more severe phenotype than LAMP-1 deficient mice and Danone disease develops in humans due to abnormalities of LAMP-2. Accumulation of autophagosome-like vesicles was observed in myocytes of Danone disease, suggesting that LAMP-2 is associated with autophagy. Since LAMP-1 and LAMP-2 are considered to be similar proteins, the reason why they are functionally different remained mystery. We first discovered that the mode of multimerization is different between LAMP-1 and LAMP-2. We reported the crystal structure analysis of the domains of LAMP-1 and LAMP-2 and based on the findings we analyzed the mode of multimerization at the atomic level by site-specific crosslinking reaction utilizing introduction of non-natural amino acid. Then we are generating LAMP-1/2 with mutation in multimerization. We would like to answer the questions "How lysosomes fuse with autophagosomes?", "What is lysosomal identity? (the mechanism by which lysosomes are reformed from autolysosomes after fusion of lysosomes with autophagosomes)?".

(5) Heparan sulfate proteoglycan-dependent cellular logistics
Heparan sulfate proteoglycans (HSPGs) are one of the basic constituents of plasma membranes and have ability to interact with a number of the extracellular ligands. HSPGs have been suggested to mediate the trafficking of various macromolecules from the cell surface. Growth factors, cytokines, lipoproteins, cell penetrating peptides, polycation-nucleic acid complexes, along with exosomes, and pathogens enter cells through HSPG-dependent endocytosis. HSPGs-dependent endocytic events have been involved in tumor progression, stressing the importance of the identification of HSPG species participating in a formation of various endocytic complexes. We have characterized the intracellular trafficking complexes formed in the presence of HSPGs in a rat C6 glioma cell line model. Successful isolation of HSPG-positive transport vesicles followed by detailed proteomic analysis allowed us the identification of over eighty proteins related to vesicular transport; i.e. endocytosis or recycling. Part of HSPGs in glioma cells found to be internalized through clathrin-dependent endocytosis and underwent recycling. Further characterization of HSPG-rich vesicular compartments will help us understand the nature of HSPG-ligand interactions and to design the tools for targeted delivery of ligands into the cells.

(6) Posture, behavior, and motion sickness of common marmosets in low gravities.
In planetary development projects such as manned Mars exploration that will take longer than 3 years, long-term biological adaptation to weightlessness and partial-gravity environments is a critical issue. Since rodents of short lifespan (rats and mice) cannot survive in such a long-term flight, other animals of longer lifespan must be used alternatively so as to conduct appropriate studies on posture and exploration as well as voice communication and social behaviors of animals that have some relevance to long-term manned spaceflight. Common marmoset belonging to the same anthropoid with humans has a lifespan of 15 years is characterized by unique social behavior resembling humans with abundant squealing. In parabolic flight experiment carried out, we first examined the adaptation and social behavior of common marmoset under such conditions as Moon and Mars simulation or weightlessness. We have gained new knowledge on the response and behavior of primates in partial gravities.

(3) Education
For the second-year undergraduate students, we are in charge of the unit, “Molecular aspect of cell biology” and “Laboratory course” under the module of “Molecular basis of biology”. The contents of “Molecular aspect of cell biology (lecture)” includes, topics related to the structure and function of membranes, transport across membranes, organization and function of intracellular organelles, intracellular trafficking, cytoskeleton, extracellular matrix, signal transduction, cell cycle and cell death.

For the graduate students, in order to demonstrate various research examples, we lectured on the structure and function of proteoglycans and the structure and role of extracellular matrix.
Lectures & Courses

For the undergraduate students, our aim is to provide the students with the basic knowledge in biochemistry to help them to understand cellular function based on the structure and function of biomolecules. For the graduate students, we encourage them to acquire an ability and research skill to study the cellular responses at molecular levels.

Publications

[Original Articles]

1. Takashi Ode, Katarzyna A Podyma-Inoue, Kazue Terasawa, Jin-Ichi Inokuchi, Toshihide Kobayashi, Tetsuro Watabe, Yuichi Izumi, Miki Hara-Yokoyama. PDMP, a ceramide analogue, acts as an inhibitor of mTORC1 by inducing its translocation from lysosome to endoplasmic reticulum. Exp. Cell Res.. 2017.01; 350(1); 103-114


3. Rie Norita, Yasuhiro Suzuki, Yutaka Furutani, Kazuki Takahashi, Yasuhiro Yoshimatsu, Katarzyna A Podyma-Inoue, Tetsuro Watabe, Yasufumi Sato. Vasohibin-2 is required for epithelial-mesenchymal transition of ovarian cancer cells by modulating transforming growth factor-β signaling. Cancer Sci.. 2017.03; 108(3); 419-426


6. Y Kumei, R Shimokawa, M Kimoto, Y Kawauchi, H Shimokawa, K Makita, K Ohya, K Toda. Gravity stress elevates the nociceptive threshold level with immunohistochemical changes in the rat brain. Acta Astronaut. 49(3-10); 381-390

[Conference Activities & Talks]

1. Katarzyna Anna Inoue, Kazuki Takahashi, Takumi Matsuda, Chihiro Takao, Yasuhiro Yoshimatsu and Tetsuro Watabe. Role of TGF-β in the invasiveness of oral carcinoma cells. Joint Symposium of Immunology and Pathological Biochemistry Units 2017.03.08 Tokyo


5. Tetsuro Watabe. Roles of signaling and transcriptional networks in the formation and maintenance of lymphatic vessels. Kitasato Research Forum 2017 on Vascular Biology 2017.05.31 Kitasato University School of Medicine

6. Miki Yokoyama, Takashi Ode, Kazue Terasawa, Katarzyna Anna Inoue, Jin-Ichi Inokuchi and Tetsuro Watabe. PDMP, a ceramide analogue, acts as an inhibitor of mTORC1 by inducing its translocation from lysosome to endoplasmic reticulum. The 59th JCBL Meeting 2017.06.16 Kyoto
7. Tetsuro Watabe. Targeting signaling networks in tumor microenvironment. 1st International Cancer Precision Medical Conference 2017.06.29 Tokyo


9. Miki Yokoyama, Takashi Ode, Kazue Terasawa, Katarzyna Anna Inoue, Jin-Ichi Inokuchi and Tetsuro Watabe. PDMP, a ceramide analogue, acts as an inhibitor of mTORC1 by inducing its translocation from lysosome to endoplasmic reticulum. The 12th Sphingotherapy Conference 2017.07.16


11. Tetsuro Watabe. Roles of TGF-β family signals during endothelial-to-mesenchymal transition. the TGFbeta meeting in Uppsala 2017.09.02 Sweden


17. Kazuki Takahashi. Cell cycle arrest in oral squamous carcinoma cells undergoing TGF-β-induced epithelial to mesenchymal transition. The 2017 Workshop of Intractable Disease Unit (Cancer) of TMDU 2017.11.06 Tokyo


Cell Signaling

Professor (Principal Investigator) Tomoki NAKASHIMA
Assistant Professor Mikihito HAYASHI
Assistant Professor Takehito ONO

(1) Research

Research Subjects
1) Regulation of bone remodeling by bone cells
2) Identification of bone-derived systemic regulatory factors (osteokines)
3) Mechanism of sensing and adapting to mechanical stress
4) Functional analysis of genes by gene manipulations and gene-disrupted mice
5) Development of clinical application by experimental animal disease models

(2) Education

Purpose of Education
Organized signal networks in the body are crucial for the higher physiological functions and the tissue organization. To understand the regulation of signal events, we take on cell signaling course including the molecular mechanism of both the “intra” cellular and the “inter” cellular signal transduction. Especially, the course will be focused on the molecular networks of signal transduction in osteoclasts, osteoblasts and osteocytes which is a new integrated field of osteonetwork (systemic network between bone and other systems). Besides, to promote the practical and clinical understanding, the course will deal with the molecular mechanism of osteoporosis and inflammatory bone destructed diseases, such as periodontal disease and rheumatoid arthritis, in parallel with the basic molecular biology.

(3) Publications

[Original Articles]


2. [Cell Signaling : SASAKI Fumiyuki] Ikeda K, Koga T, Sasaki F, Ueno A, Saeki K, Okuno T, Yokomizo T. Generation and characterization of a human-mouse chimeric high-affinity antibody that detects the DYKDDDDK FLAG peptide. Biochemical and biophysical research communications. 2017.05; 486(4); 1077-1082

3. [Cell Signaling : NAKASHIMA Tomoki] Kazuki Nagashima, Shinichiro Sawa, Takeshi Nitta, Masanori Tsutsumi, Tadashi Okamura, Josef M Penninger, Tomoki Nakashima, Hiroshi Takayanagi. Identification of subepithelial mesenchymal cells that induce IgA and diversify gut microbiota. Nat. Immunol.. 2017.06; 18(6); 675-682
4. [Cell Signaling: NAKASHIMA Tomoki] Y Fukushima-Nakayama, Takehito Ono, M Hayashi, M Inoue, H Wake, Takashi Ono, T Nakashima. Reduced Mastication Impairs Memory Function. J. Dent. Res.. 2017.08; 96(9); 1058-1066


[Misc]

1. [Cell Signaling: ONO TAKEHITO] Takehito Ono. The roles of the immune cells and cytokines in bone fracture healing Infection, Inflammation and Immunity. 2017.04; 47(1); 61-64


[Conference Activities & Talks]


Periodontology

From April, 2017
【Professor】 Yuichi Izumi
【Associate Professor】 Akira Aoki
【Junior Associate Professor】 Yasuo Takeuchi, Tatsuya Akizuki
【Assistant Professor】 Koji Mizutani, Sayaka Katagiri, Yuichi Ikeda (May ~)
【Specially appointed researches】 Yuichi Ikeda (Apr)
【Clinical Fellow】
Yuuka Tsumanuma, Takanori Matsuura, Takahiro Ikawa, Takahiko Shiba
Shogo Maekawa, Hiroki Sato, Mizuki Nagata (~ Sep), Masahiro Noda (Oct ~)
【Graduate Students】
【Adult graduate student】
Kaori Fujimura, Masaki Tsubokawa, Naho Suzuki, Akiko Kobayashi, Miho Ogawa
【Graduate Research Student】
Hideyuki Takamatsu, Yukako Kusunoki, Masahiro Noda (~ Sep), Shogo Takeuchi, Takeaki Sudo, Kosei Yano, Saori Katayama (~ Jun), Akihito Nakazato, Takashi Furuiichi, Taiki Mise, Taka Shimoda, Ryo Hirai, Yuto Mukaiyama, Naoko Yoshida, Yoshiyuki Iwabuchi, Aya Suzuki, Kei Komatsu, Shota Mori
【Clinical Professor】 Hiroaki Kobayashi (Jul ~)
【Registered dentist】: 40
【Assistant Administrative Staff】 Tomomi Anai

(1) Outline

Periodontology is a branch of dental sciences which deals with the research, prevention and treatment of periodontal diseases. Periodontal disease is a general disease name which occurred in the periodontal tissue: gingiva, periodontium, cementum and alveolar bone. At present, it is indicated mainly an acute or chronic inflammatory diseases. The mission of our department was to educate etiology of periodontal diseases, host response, oral bacteria, periodontal medicine, regenerative therapy and so on profoundly, and to find a solution through discussion research outcomes as to periodontal destructive process and to develop a novel periodontal treatment modalities.

(2) Research

1) Inflammatory and immunological factors in periodontal diseases
2) Periodontopathic bacteria and their pathogenicity
3) Influence of periodontal disease on general health
4) Analyses of growth factors and bio materials in periodontal regeneration
5) Clinical applications of laser in periodontics

(3) Lectures & Courses

Periodontology is a branch of dental science which deals with supporting structures of teeth, diseases and conditions affect them. Main objectives of periodontology in the graduate course is to provide students basic knowledge of etiology of periodontal diseases, its treatment modality and prognosis, and also to study advanced regenerative therapy.

(4) Clinical Performances

Periodontal clinic provides diagnosis, treatment and prevention of periodontal disease. Periodontal surgery and regenerative therapy are also performed in the clinic.

(5) Publications

[Original Articles]


2. Thanakun S, Poruprasertsuk-Damrongsi S, Izumi Y. C-reactive protein levels and the association of carotid artery calcification with tooth loss. Oral Dis. 2017.01; 23(1); 69-77

3. Ode T, Podyma-Inoue KA, Terasawa K, Inokuchi JI, Kobayashi T, Watabe T, Izumi Y, Hara-Yokoyama M. PDMP, a ceramide analogue, acts as an inhibitor of mTORC1 by inducing its translocation from lysosome to endoplasmic reticulum. Exp. Cell Res. 2017.01; 350(1); 103-114


9. Aoyama N, Suda T, Ikeda Y, Kinebuchi E, Sekiuchi T, Koyanagi T1, Hayakumo S, Mizutani K, Akizuki T, Izumi Y. Systemic Condition of First-visit Patients to the Periodontics Section of Tokyo Medical and Dental University Hospital. The Journal of the Stomatological Society, Japan. 2017.03; 84(1); 37-44


23. Thanakun S, Pornprasertsuk-Damrongsi R, Izumi Y. Increased oral inflammation, leukocytes, and leptin, and lower adiponectin in overweight or obesity. Oral Dis. 2017.10; 23(7); 956-965


— 118 —


[Books etc]


[Misc]

2. Izumi Y, Akizuki T. Periodontal treatment 2 - surgical procedures, periodontal maintenance - Dental magazine. 2017.03; 160; 28-31


6. Aoki A, Mizutani K, Noda M, Izumi Y. Application of Er:YAG laser in periodontal therapy OPRONICS. 2017.07; (427); 81-87


[Conference Activities & Talks]


2. Takahiro Ikawa, Tatsuya Akizuki, Ammar Shujaa Addin, Takenori Matsuura, Shu Hoshi, Shunsuke Fukuba, Yuichi Izumi. Ridge augmentation using various structures of β-TCP in dogs. 2017 IADR/AADR/CADR General Session & Exhibition 2017.03.22 San Francisco, Calif., USA

3. Daisuke Kido, Koji Mizutani, Kohe Takeda, Takenori Matsuura, Yuichi Izumi. Insulin resistance causes impaired gingival wound healing in diabetic rats. the 95th General Session & Exhibition of the IADR 2017.03.24 San Francisco, Calif., USA


12. The clinical and educational effects of the newly-introduced interprofessional clinical practice. 2017.05.13

13. Aoki A. Effective application of Er:YAG laser in periodontics. Morita 2017 laser seminar 2017.05.28


15. Aoki A. Effect of UV LED on periodontopathic bacteria. Grant meeting for development of new laser/LED devices in dental treatment 2017.06.01 Obu, Aichi prefecture

16. Takahiro Ikawa, Tatsuya Akizuki, Kiichi Maruyama, Wataru Ono, Ammar Shujaa Addin, Yuichi Izumi. Evaluation of three-dimensional morphological changes in teeth extraction sites after ridge augmentation using Bio-Oss and Bio-Gide; a six-month clinical study. National Symposium Ostology Japan 2017.06.03 Tokyo, Japan

17. Maekawa S, Matsuura T, Hoshi S, Mizutani K, Izumi Y. Patient-Reported Outcomes and Clinical Evaluation of Combination Therapy of GTR with Autograft or Xenograft: Interim report of a Randomized Controlled Trial. National Symposium OSTEOLOGY JAPAN 2017.06.03 Tokyo


19. Aoki A. Recent progress of Er:YAG laser application in periodontal therapy. China-Japan symposium for oral medicine 2017.06.10 Peking, China


36. Aoki A. Progress of Er:YAG laser application in periodontal pocket therapy. 20th Anniversary Forum of Er:YAG Laser 2017.11.26 Ochanomizu Solacity Conference Center, Tokyo

37. Aoki A. Periodontal Er:YAG Laser Operation. Continuing Dental Education Course, Dental Alumni Association, Tokyo Medical and Dental University (TMDU) 2017.12.03 Tokyo Medical and Dental University (TMDU), Tokyo


[Awards & Honors]

1. MING CHEN KAO AWARD (Ayano Uekubo), 2017.03
2. Student Scholarship Second Prize (Masaki Tsubokawa), Academy of Laser Dentistry, 2017.04
3. Excellent Poster Award (Takahiro Ikawa), National symposium Osteology Japan, 2017.06
4. Young Investigator Travel Award (Yuichi Ikeda), Twelfth International Conference on the Chemistry and Biology of Mineralized Tissues, 2017.06
5. Best Clinical Research Award, National Symposium OSTEOLOGY JAPAN (Maekawa S), National Symposium OSTEOLOGY JAPAN, 2017.06
6. Advanced Education System Development(Kanako Noritake), Japanese Dental Education Association, 2017.07
7. The First Prize for Best Presentation(Yuichi Ikeda), The Stomatological Society, Japan, 2017.11
Global Health Promotion

Professor: Takeo Fujiwara, MD, MPH, PhD (Apr-)
Assistant Professor: Keiko Nakamura, MD, PhD (-Mar)
Junior Associate Professor: Masashi Kizuki, MD, MPH, PhD; Kaoruko Seino, PhD (-Mar)
Assistant Professor: Ayako Morita, PhD
Research Fellow of Japan Society for the Promotion of Science: Yukako Tani, PhD; Satomi Doi, PhD (Apr-Sep)
Project Researcher: Aya Isumi, PhD; Satomi Doi, PhD (Oct-)

(1) Outline

The purpose of this course is to develop the knowledge and skills of the participants to prevent diseases. Participants will: understand broad risk factors from individual factors (e.g., genetic factor) and environmental factors, especially social determinants, their interactions; make causal inference applying a life-course perspective on disease onset (e.g., long-term effect of fetus or childhood exposure); perform advanced statistics; acquire attitudes toward social contribution through writing and publishing scientific papers in international journals. The final goal is that the participants are able to plan and implement health policy or program to prevent diseases in a real life setting.

(2) Research

The main focus of the department is as follows:
1. Social epidemiology (impact of social inequality, social capital, social network, and social support on health)
2. Life-course epidemiology (impact of child poverty and adverse childhood experiences on health) and international comparison study
3. Prevention on child abuse and neglect
4. Disaster and child and their family’s mental health
5. Nutrition during pregnancy or early childhood and health

(3) Education

The faculty of department teach Public Health and Social Medicine for grade 3 medical students, Public Health Practice for grade 4 medical students, and graduate students seminars.

(4) Lectures & Courses

The purpose of this course is to develop the knowledge and skills of the participants to prevent diseases. Participants will: understand broad risk factors from individual factors (e.g., genetic factor) and environmental factors, especially social determinants, their interactions; make causal inference applying a life-course perspective on disease onset (e.g., long-term effect of fetus or childhood exposure); perform advanced statistics; acquire attitudes toward social contribution through writing and publishing scientific papers in international journals. The final goal is that the participants are able to plan and implement health policy or program to prevent diseases in a real life setting.

The participants will be able to: 1. explain the risk of disease.
2. verbalize own research question and develop a hypothesis to test it.
3. develop research field or access secondary data to test the hypothesis.
4. explain an epidemiologic study design.
5. calculate a sample size.
6. analyse basic model (multivariate analysis, logistic analysis, etc) and conduct advanced analysis (multilevel analysis, propensity score matching, multiple imputation, etc)
7. justify the research question logically, in scientific writing in English.
8. develop an intervention (policy or program) and design a study protocol to assess its effectiveness.

(5) Publications

[Original Articles]


5. Rakprasit Jutarat, Nakamura Keiko, Seino Kaoruko, Morita Ayako. Healthcare use for communicable diseases among migrant workers in comparison with Thai workers Industrial Health. 2017.01; 55(1); 67-75


7. Tabuchi T, Fujiwara T, Shinozaki T. Tobacco price increase and smoking behaviour changes in various subgroups: a nationwide longitudinal 7-year follow-up study among a middle-aged Japanese population. Tobacco control. 2017.01; 26(1); 69-77


9. Nawa N, Kogaki S, Ozono K. Listening to public concerns on vaccinations in order to provide information in a timely manner. Vaccine. 2017.03; 35(10); 1369


17. Kohei Ogawa, Naho Morisaki, Shigeru Saito, Shoji Sato, Takeo Fujiwara, Haruhiko Sago. Association of Shorter Height with Increased Risk of Ischaemic Placental Disease. Paediatric and Perinatal Epidemiology. 2017.05; 31(3); 198-205


20. Kato T, Fujiwara T, Kawachi I. Associations between mothers’ active engagement with infants at 6months and children’s adjustment to school life at ages 5.5 and 11years CHILD CARE HEALTH AND DEVELOPMENT. 2017.05; 43(3); 406-414


24. Hikichi H, Tsuboya T, Aida J, Matsuyama Y, Kondo K, Subramanian SV, Kawachi I. Social capital and cognitive decline in the aftermath of a natural disaster: a natural experiment from the 2011 Great East Japan Earthquake and Tsunami. The Lancet. Planetary health. 2017.06; 1(3); e105-e113


29. Suginobe H, Nawa N, Ishida H, Kogaki S. Converting everolimus to mycophenolate mofetil ameliorated prolonged respiratory syncytial virus infection in a child after heart transplantation. BMJ case reports. 2017.08; 2017;
30. Tomitsuka Eriko, Igai Katsura, Tadokoro Kiyoshi, Morita Ayako, Baba Jun, Suda Wataru, Greenhill Andrew R., Horwood Paul F., Soli Kevin W., Siba Peter M., Odani Shingo, Natsuhara Kazumi, Morita Hidetoshi, Umezaki Masahiro. Profiling of faecal water and urine metabolites among Papua New Guinea highlanders believed to be adapted to low protein intake METABOLOMICS. 2017.09; 13(9);

31. Isumi A, Fujiwara T. Synergistic Effects of Unintended Pregnancy and Young Motherhood on Shaking and Smothering of Infants among Caregivers in Nagoya City, Japan. Frontiers in public health. 2017.09; 5(245);


34. Minatsu Kobayashi, Kohei Ogawa, Naho Morisaki, Yukako Tani, Reiko Horikawa, Takeo Fujiwara. Dietary n-3 Polyunsaturated Fatty Acids in Late Pregnancy and Postpartum Depressive Symptom among Japanese Women. Front Psychiatry. 2017.11; 8; 241


[Books etc]

[Misc]
1. Inoue Y., Stickley A., Yazawa A., Aida J., Kawachi I., Kondo K., Fujiwara T.. Adverse childhood experiences, exposure to a natural disaster, and posttraumatic stress disorder among survivors of the 2011 Great East Japan earthquake and tsunami AMERICAN JOURNAL OF HUMAN BIOLOGY. 2017; 29(2);

[Conference Activities & Talks]
1. Masashi Kizuki, Takeo Fujiwara. Interaction effect between adult attachment pattern and social support on psychological distress. The 27th Annual Scientific Meeting The Japan Epidemiological Association Program and Abstracts 2017.01.27 Kofu city, Yamanashi
2. Tanaka Takakuni, Hong Guang, Izumi Masayuki, Saito Tomoya, Nishi Kentaro, Matsuyama Yusuke, Chiba Mirei, Toda Takashi, Kudou Tadakki. Association of oral fat sensitivity with mental state in healthy young adults. The Journal of Physiological Sciences 2017.03.01
3. Tatsuo Yamamoto, Jun Aida, Katsunori Kondo, Shinya Fuchida, Yukako Tani, Masashige Saito, Yuri Sasaki.. Oral Health and Incident Depressive Symptoms in Older Japanese. IADR2017 2017.03.24 San Francisco, USA
4. Morisaki N, Kawachi I, Oken E, Fujiwara T. Social and anthropometric factors explaining racial/ethnical
differences in birth weight in the United States.. Scientific reports 2017.04.21

nosome aneuploidies perturb protein homeostasis and cause a premature senescence in human fibroblasts.
Keystone Symposia Conference on Aging and Mechanisms of Aging-Related Disease 2017.05

6. Ogawa K, Jwa SC, Kobayashi M, Morisaki N, Sago H, Fujiwara T. Validation of a food frequency question-
naire for Japanese pregnant women with and without nausea and vomiting in early pregnancy.. Journal
of epidemiology 2017.05.01

7. Takeo Fujiwara. Effectiveness of an Educational Video on Ahaking and Smothering when Used in Ma-
ternity Wards at First Week of Age: A Cluster Randomized Controlled Trial . Sixth Penn State Health
International Conference on Pediatric Abusive Head Trauma 2017.06.30

8. Okuzono S, Fujiwara T, Kato T, Kawachi I. Spanking and subsequent behavioral problems in toddlers:
A propensity score-matched, prospective study in Japan.. Child abuse & neglect 2017.07.01

efficacy and children’s development.. Journal of epidemiology 2017.08.01

10. Takeo Fujiwara. Suicide risk among young children after the Great East Japan Earthquake: A follow-
up study. The 21st International Epidemiological Association (IEA), World Congress of Epidemiology
(WCE2017) 2017.08.21

11. Masashi Kizuki. Diversity of neighborhood retail food stores affects mortality from acute myocardial
infarction. The 21st International Epidemiological Association (IEA) World Congress of Epidemiology
(WCE2017) 2017.08.22 Omiya city, Saitama Prefecture

12. Takeo Fujiwara. Childhood poverty and health: what policy makers should know. The 21st International
Epidemiological Association (IEA), World Congress of Epidemiology (WCE2017) 2017.08.22

gestational weight gain for women in Japan.. Journal of epidemiology 2017.10.01

14. Takeo Fujiwara. Environmental risk factors on autism spectrum disorder: perspective from social epi-

2017.11.01
Environmental Parasitology

Professor: Shiroh IWANAGA
Lecturer: Takashi KUMAGAI
Assistant Professor: Naoaki SINZAWA, Akina HINO
Project Associate Professor: Mitsuko OHASHI (AMED J-GRID)
PhD Course Students: Emmanuel BLAY (D4),
Kofi KWOFIE (D3),
Michael Amoa-Bosompem (D2),
Sho ARIMOTO (D2)
Master Course Students: Fumiya HIYOSHI (M2),
Takashi SEKINE (M1),
Tsubasa NISHI (M1),
Taishi HIRAYAMA (M1)

(1) **Outline**

Parasitic infectious diseases including Malaria and some neglected tropical diseases have been still been prevalent over the world and the countermeasures against them are urgent issues in the global public health. The scientific research plays an important role in not only understanding the biology of the parasites, but also in developing the effective vaccines and new drugs.

Our laboratory carries molecular biological studies out on malaria and schistosome parasites. In particular, we are interested in transcriptional and epigenetic regulation of gene expression in malaria parasites, *P. falciparum*, and the communication between schistosome parasites using the extracellular vesicles including small RNAs. We are also interested in the drug resistance of malaria parasites and are thus attempt to identify the drug resistance gene by Plasmodium artificial chromosome, which is developed by us. In addition, we performed the epidemiological studies about Opisthorchis and Schistosomiasis to develop the new diagnostic tools. Furthermore, since 2008, we have carried the research project on infectious diseases out in collaboration with researchers of Noguchi Memorial Institute for Medical Research. In this project, we mainly attempt to identify the new anti-parasitic compounds against African trypanosomiasis and utilize them as lead compound for drug development.

(2) **Research**

The following studies have been carried out in our laboratory with molecular genetic, cell biological, and biochemical techniques:

(1) Elucidation of molecular mechanism of transcriptional regulation of Malaria parasite, *P. falciparum*. (the functional analysis of AP2 transcriptional factors)

(2) Identification of drug resistance genes of Malaria parasite using the artificial chromosome technology.

(3) Investigation of cell-cell communication of schistosome parasites with extracellular vehicle containing small RNA.

(4) Host immune response during parasite infection: Th2 response to helminth infection.

(5) Epidemiological survey of Opisthorchis infection and Schistosomiasis in SE Asian areas using new diagnostic tools based on LAMP method.

(6) Identification of new anti-parasitic compounds from Ghanaian medical herbs.
(3) Education

Main objective of the parasitology course for undergraduate students is to provide them the basic knowledge of pathogenicity, treatment and diagnosis of parasitic diseases. We also lecture about the global action against parasitic diseases and basic biology of parasites. In the parasitology course for graduate students, they carry out the advanced molecular biology study about the parasites, in particular malaria and Schistosoma parasites, using genetic engineering, cellular biological, genome editing technologies. Furthermore, they have to join the weakly seminar, which are “seminar for the selected papers” and “the study session about the advanced molecular biology”.

(4) Lectures & Courses

Lecture and practices of basic and clinical parasitology are given. Further more, Field practice is important for future career. It is important to have field experiences where each student find matters and problems to be clarified. Together with those, final goal is to develop human resources with enough knowledge and experiences.

(5) Clinical Services & Other Works

Clinical services for the diagnosis of parasitic infections are our routine activities. Furthermore, epidemiological surveillance and disease control activities in the endemic fields are intended to enhance health and welfare of residents.

(6) Publications

[Original Articles]

1. Masafumi Yamabe, Takashi Kumagai, Rieko Shimogawara, Emmanuel Awusah Blay, Akina Hino, Koichiro Ichimura, Akira Sato, Hye-Sook Kim, Nobuo Ohta. Novel synthetic compounds with endoperoxide structure damage juvenile stage of Schistosoma mansoni by targeting lysosome-like organelles. Parasitol. Int.. 2017.02; 66(1); 917-924


5. Itaru Nakamura, Kenji Yagi, Takashi Kumagai, Nobuo Ohta. Positive fecal occult blood test as a diagnostic cue for Schistosoma mansoni infection in a developed country. IDCases. 2017.10; 10; 108-109


8. Takayuki Shiratsuchi, Urvashi Rai, Izumi Kaneko, Min Zhang, Shiroh Iwanaga, Masao Yuda, Moriya Tsuji. A potent malaria vaccine based on adenovirus with dual modifications at Hexon and pVII. Vaccine. 2017.12; 35(50); 6990-7000

[Misc]
1. Xiangming Li, Jing Huang, Izumi Kaneko, Min Zhang, Shiroh Iwanaga, Masao Yuda, Moriya Tsuji. A potent adjuvant effect of a CD1d-binding NKT cell ligand in human immune system mice. Expert Rev Vaccines. 2017.01; 16(1); 73-80

[Conference Activities & Talks]

Forensic Medicine

Professor
Koichi UEMURA

Associate Professor
Toshihiko AKI

Junior Associate Professor
Kana UNUMA

Assistant Professor
Takeshi FUNAKOSHI

Specially Appointed Assistant Professor
Kanako NORITAKE

Graduate Student
Naho HIRAYAMA
Ryo WATANABE
Midori NAGAI
Rina KASEDA
Tomomi SANO
Renho TAKAHASHI
Mako FURUKAWA

(1) Research

Research Subjects

1) Toxicology
2) Alcohol medicine
3) Forensic pathology

(2) Education

Purpose of education

Forensic medicine provides fundamental human rights, public safety and nation’s welfare to make a fair judgment on the items on the law which requires the medical knowledge. Education of forensic medicine is included forensic medicine in a narrow sense and medical law. Purpose of education in forensic medicine is to provide students opportunity to study the essential knowledge of the relationship between medical and society (include law, ethics, suit and administration). Students are also taught a blood type and an alcohol medicine in a practical training.
(3) Clinical Services & Other Works

Practical services

Forensic Medicine provides the expert opinion on a living body and a corpse to clarify causes of wound and death, mainly entrusted by a public prosecutor or the police, thereby, contributing fair trial in a court.

(4) Publications

[Original Articles]


[Misc]


Health Care Management and Planning

Professor Kazuo KAWAHARA
Assistant Professor Makiko SUGAWA
Graduate Student Jian CHEN
Woonkwan HYUN
Masakazu KIKUCHI
Yoko KOMURA
Daisuke KUMAZAWA
Masao MURATA
Hisashi OMOTE
Masataka YANO
Hayato TAKAYAMA
Ritsuki NEGISHI
Katsunori OHOYAMA

(1) Outline

By analyzing the Japanese healthcare policies and system and by reviewing their interaction with society, the structural characteristics and issues can be clarified. To resolve or find better ways to handle these issues, we conduct research into public health and welfare, and its related disciplinary areas. With the cooperation of active policy makers and personnel from the healthcare departments, the research results can be applied to the present healthcare policies and system. Through this education on collecting data, clarifying issues, analyzing the situation, and evaluating options, students taking this course are expected to grow in their ability to make healthcare policies.

(2) Research

In the academic areas mentioned above, we conduct research under the following topic areas:

1) The significance of public healthcare planning, its challenges, and influences on the healthcare system
We conduct research on issues related to new healthcare policies including planning, analysis, issue resolution, and making positive changes to the healthcare plan. This research area includes the Japanese emergency medical service and the impartial evaluation of the travel distance of aid agents and the time required for them to reach their destination.

2) Structural choices concerning national blood services
In Japan, we experienced HIV infection from tainted blood products. There were various causes for this event, and improvements are required in all processes: collecting blood, screening blood, manufacturing blood products, and following-up on the usage of these products. By analyzing background information related to the adverse events and their causes, we can propose the most appropriate policies related to blood services, thus ensuring safety, and securing a stable supply. To achieve a stable supply of blood products, we also conduct epidemiological studies to review guidelines on collecting blood.

3) The government role in preventing medical errors
Issues related to medical errors and adverse events have recently attracted a great deal of attention in Japan. We study the role that the government should play regarding various medical errors and their prevention as well as review and address the financial loss caused by blood-related adverse events and policies on prevention.

4) Structural analyses of healthcare system in the community
By reviewing and analyzing activities related to disease prevention and health promotion conducted by local healthcare centers, we research the role of the local healthcare system and its effectiveness and efficiency.

5) Systemizing and evaluating public health policies
We review the processes of creating public health policies and systems, address the association with the creating processes and stakeholders such as political parties and lobby groups, evaluate their policies, and then suggest improvements to these policies and systems.

6) The role of healthcare communication to fill in gaps between medical providers and patients, and to share the uncertainties related to medicine and healthcare

7) The influence of healthcare communication on patient and medial safety

8) Reviewing communication tools and skills, and their systematic introduction into the healthcare system in order to realize patient participation and proactive involvement in treatment processes

(3) Publications

[Original Articles]

1. Takamichi Kogure, Masahiko Sumitani, Hiroaki Abe, Jun Hozumi, Reo Inoue, Kazuhito Mietani, Kazuo Kawahara, and Yoshitsugu Yamada. Ischemic Ulcer Pain Is Both Nociceptive and Neuropathic Pain Based on a Discriminant Function Analysis Using the McGill Pain Questionnaire Journal of Pain & Palliative Care Pharmacotherapy. 2017.04; 0(0); 1-7
Molecular Epidemiology

Professor: Masaaki MURAMATSU
Associate Professor: Noriko SATO
Assistant Professor: Chihiro Imai

Adjunct Instructor: Katsuko SUDO, Jun-ichi TAGUCHI

Graduate Student: Kaung Si Thu,
Khin Thet Thet Zaw, Yuko Maeda, Fujitani,
Tay Zar Kyaw, Tadaaki Katsuta, Jyun-ya Hagiwara, Shilpa Pavethynath
Norihiko Satake, Maidina Abudushataer, Ake Ko Ko Minn, Zong Yuan, Kenji Suzuki, Hirokazu Sakamoto,
Yuiri Tsubota
Research Student: Tong Daike

(1) Outline

Many common chronic diseases are multifactorial in that they are caused by multiple genetic and environmental factors. By applying the technology and information of human genome to epidemiological studies, we aim to clarify the role of genetic polymorphisms, epigenetic changes, as well as their interaction with environmental factors, which may contribute to the development of these diseases.

(2) Research

Our research subjects are as follows.

1. Gene-environment interaction that affects the onset of metabolic syndrome and its related phenotypes.
2. Genetic factors that affect the severity of pathological atherosclerosis.
3. Severe cutaneous adverse response (Stevens-Jhonson’s Syndrome) and HLA genotypes.
4. The role of epigenetic regulation and fetal programming in common diseases.
5. Application of personal genome to preemptive & preventive medicine.

(3) Education

Masaaki Muramatsu: Holistic Study of Disease Prevention I
Masaaki Muramatsu: Environmental/Social Health
Masaaki Muramatsu: Negotiation and Debate in English
Noriko Sato, Masaaki Muramatsu: Bioscience I
Noriko Sato: Molecular and Cellular Biology
Noriko Sato: Introduction to Human Molecular Genetics
(4) **Lectures & Courses**

We focus on common diseases such as diabetes, hypertension, obesity, metabolic syndrome, and atherosclerosis which are caused by multiple genetic and environmental factors, and aim to decipher these factors as well as their interactions by applying the technology and information of human genome to epidemiology. Our goal is not only to identify disease genes and polymorphisms but also to elucidate gene-environment interactions that contribute to the onset and progression of the diseases. Epigenetic changes in common diseases are also in our scope. A new project has been started to study methods for educating genome-based health literacy by employing information generated from personal genome sequences.

(5) **Publications**

**[Original Articles]**


**[Misc]**

1. Sariya Dechamethakun, Masaaki Muramatsu. Long noncoding RNA variations in cardiometabolic diseases. J. Hum. Genet.. 2017.01; 62(1); 97-104


**[Conference Activities & Talks]**

1. Hidemi Takimoto , Motoko Okamitsu , Noriko Sato , Tay Zar Kyaw , Nay Chi Htun , Chihiro Inai , Yuiri Tsubota , Reiko Tajirika-Shirai , Satoshi Yago , Tomoko Aoyama , Naoyuki Miyasaka. Dietary intakes from 3-day weighed dietary records among pregnant participants in the Birth Cohort - Gene and ENvironment Interaction Study of TMDU (BC-GENIST). The 21st World Congress of Epidemiology (WCE2017) 2017.08.21
2. Noriko Sato, Hidemi Takimoto, Motoko Okamitsu, Tay Zar Kyaw, Chihiro Imai, Nay Chi Htun, Satoshi Yago, Tomoko Aoyama, Seiji Yamaguchi and Naoyuki Miyasaka. Study design: the evaluation of interindividual differences in neonatal epigenome - the BC-GENIST project. the 21st World Congress of Epidemiology, International Epidemiological Association 2017.08.21 Saitama, Japan

3. Hidemi Takimoto, Motoko Okamitsu, Noriko Sato, Tay Zar Kyaw, Nay Chi Htun, Chihiro Imai, Yuiri Tsubota, Reiko Tajirika-Shirai, Satoshi Yago, Tomoko Aoyama, Naoyuki Miyasaka. Dietary intakes from 3-day weighed dietary records among pregnant participants in the Birth Cohort - Gene and ENvironment Interaction Study of TMDU (BC-GENIST). the 21st World Congress of Epidemiology, International Epidemiological Association 2017.08.21 Saitama, Japan
Research Development

Faculty Staff
Professor
Kozo TAKASE

Graduate Students
Doctor course
Akemi HIRABAYASHI
Tomoko IZUGAMI
Akira MIURA
Yasunasa OOSHIRO
Hideki TERUYA
Masakazu HARAMO
Rinshuu SHIMABUKURO
Kazushige ENDOH

Master course (Master of Medical Administration)
Hirotaka IMAYUKI
Michio UEMATSU
Miwako KADOTA
Mizue NAGASAWA
Hiroko HAYAO
Junichi FURUTA
Kengo WAKABAYASHI

( 1 ) Research

1) Introduction of Clinical Pathway in hospital
2) Medical law suit and professional information
3) Quality management of medical law suit
4) Organizational logic for hospital
5) Health care policy and rational
6) Management of medical information and privacy
7) Hospitality in medicine
8) Clinical guideline and medical quality
9) Patient satisfaction and patient experience
10) Development of medical engineering apparatus

( 2 ) Education

1) Hospital Information Management
2) Medical Informatics, statistics
3) TQM in medicine
4) Biological bias and data management
5) Medical Law and Ethics
6) Medical induction course for Judges and Prosecutors (collaborated with the Supreme Court and Department of Justice)
7) Health Promotion Policy program (General Medicine, Risk Management in Medicine) with Hitotsubashi University

(3) Lectures & Courses

Study on development of medical system and hospital management

Goals/outline:
The goals supposed in the lecture are mastering the technique of implementation of research development and acquiring the ability of management of projects.

(4) Clinical Services & Other Works

Kozo TAKASE

Committee member of Legal Training for Judicial Apprentice, Japanese Supreme Court
Committee member of Tokyo District Court
Chief Editorial Board of Japanese Society for Clinical Pathway

(5) Publications

[Original Articles]

Health Policy and Informatics

Professor: Kiyohide FUSHIMI
Graduate Student: Asako TUKASAKI, Kyoko SHINODA, Ayako MATSuo, Motoko TAIMA (SANO), Toshihiro TAMAKI, Yuya MIZUNO, Tetu OHNUMA, Akira HOMMA, Eishi UECHI, Nobuo SAKATA, Tomomitu ICHIKAWA, Mariko KODAN, Norihiko INOUE, Kyoko HIRANO, Mihoko OTA, Ken KAWASAKI, Natsuko KANAZAWA, Shunsuke EDAKUBO, Yoshiteru YANO, Yoko NUKAYA, Senri WATANABE, Risa SUZUKI, Akihito UDA, Yuka SATO
Graduate Research Student: Masahiro INOUE

(1) Research

1) Functional differentiation and coordination of healthcare facilities
2) Development and application of patient case mix system for Japanese healthcare settings
3) Application of information technology to standardization of health care and sharing of health care information.

(2) Education

Health policy informatics is a branch of health policy science which deals with the application of information technology to health policy research. Main objective of health policy informatics in the graduate course is to acquire ability to independently design, manage and accomplish researches in health policy and health informatics fields.

(3) Publications

[Original Articles]


2. Takahiro Inoue, Hiroyo Kuwabara, Kiyohide Fushimi. Regional Variation in the Use of Percutaneous Coronary Intervention in Japan. Circ. J.: 2017.01; 81(2); 195-198


8. Yusuke Sasabuchi, Hiroki Matsui, Hideo Yasunaga, Kiyohide Fushimi. Increase in avoidable hospital admissions after the Great East Japan Earthquake. J Epidemiol Community Health. 2017;03; 71(3); 248-252


11. Hiroyuki Odagiri, Hideo Yasunaga, Hiroki Matsui, Shigeru Matsui, Kiyohide Fushimi, Mitsuru Kaise. Hospital volume and adverse events following esophageal endoscopic submucosal dissection in Japan. Endoscopy. 2017;04; 49(4); 321-326


16. Shotaro Aso, Hiroki Matsui, Kiyohide Fushimi, Hideo Yasunaga. Resuscitative endovascular balloon occlusion of the aorta or resuscitative thoracotomy with aortic clamping for noncompressible torso hemorrhage: A retrospective nationwide study. J Trauma Acute Care Surg. 2017;05; 82(5); 910-914


19. Kojiro Morita, Hiroki Matsui, Kiyohide Fushimi, Hideo Yasunaga. Association between Nurse Staffing and In-Hospital Bone Fractures: A Retrospective Cohort Study. Health Serv Res. 2017.06; 52(3); 1005-1023


30. Wakae Hasegawa, Yasuhiro Yamauchi, Hideo Yasunaga, Hideyuki Takeshima, Yukio Sakamoto, Taisuke Jo, Yusuke Sasabuchi, Hiroki Matsui, Kiyohide Fushimi, Takahide Nagase. Prognostic nomogram for inpatients with asthma exacerbation. BMC Pulm Med. 2017.08; 17(1); 108


37. Taisuke Jo, Hideo Yasunaga, Yusuke Sasabuchi, Nobuaki Michihata, Kojiro Morita, Yasuhiro Yamauchi, Wakae Hasegawa, Hideyuki Takeshima, Yukiyo Sakamoto, Hiroki Matsui, Kiyohide Fushimi, Takahide Nagase. Association between dementia and discharge status in patients hospitalized with pneumonia. BMC Pulm Med. 2017.10; 17(1); 128

38. Toshiaki Isogai, Hiroki Matsui, Hiroyuki Tanaka, Kiyohide Fushimi, Hideo Yasunaga. Seasonal variation in patient characteristics and in-hospital outcomes of Takotsubo syndrome: a nationwide retrospective cohort study in Japan. Heart Vessels. 2017.10; 32(10); 1271-1276


[Conference Activities & Talks]

Life Sciences and Bioethics

Masayuki Yoshida
Yusuke Ebana
Hiroko Kohbata
Mizuko Osaka
Eiichiro Kanda

(1) Outline

Department of Life Sciences and Bioethics (Bioethics Research Center) offers classes and seminars regarding bioethics, research ethics, and clinical ethics in Graduate School of Medical and Dental Sciences, Graduate School of Health Care Sciences, and School of Medicine. Our lecture includes fundamental bioethics and research ethics so that students can absorb the current concept of the bioethics and research ethics. We try to include clinical materials such as cases of genetic counseling, where ethics-based approach is critically important.

Apart from class for juniors, we give bioethics seminars for hospital staff and faculties based on the research ethics guideline revised 2008, in which attendance of bioethics lecture is mandatory for any person who conducts medical research.

We dynamically participated in extra-campus activities; such as the ethical committee members of the National Institute of Health etc.

(2) Publications

[Original Articles]


5. Ebana Yusuke. Precision Medicine Based on Genetic Information Combined Analysis Using GWAS and Array Data Detecting Associated Pathway and Shared Genomic Structure Japanese Circulation Society Scientific Meeting Abstracts. 2017.03; 81; SY14-3

6. Shintaro Akiyama, Toshimitsu Fujii, Katsuyoshi Matsuoka, Ebana Yusuke, Mariko Negi, Kento Takenaka, Masakazu Nagahori, Kazuo Ohitsuka, Mitsuaki Isobe, Mamoru Watanabe. Endoscopic features and
genetic background of inflammatory bowel disease complicated with Takayasu arteritis. J. Gastroenterol. Hepatol.. 2017.05; 32(5); 1011-1017


9. Ohigashi Hirokazu, Tamura Natsuko, Ebana Yusuke, Harigai Masayoshi, Maejima Yasuhiro, Ashikaga Takashi, Isobe Mitsuaki. Effects of immunosuppressive and biological agents on refractory Takayasu arteritis patients unresponsive to glucocorticoid treatment Journal of Cardiology. 2017.06; 69(5-6); 774-778


15. Takahashi Sayako, Terui-Kohbata Hiroko, Ebana Yusuke, Yoshida Masayuki. Analysis of the Present Recognition Toward a Central IRB (cIRB) System in Japanese Medical Schools JOURNAL OF EMPIRICAL RESEARCH ON HUMAN RESEARCH ETHICS. 2017.12; 12(5); 394-395


[Misc]

1. Yusuke Ebana. Ethics required for clinical research Endocrinology, Diabetology & Metabolism. 2017.08; 45(2); 86-90

[Conference Activities & Talks]

1. Yusuke Ebana. Combined Analysis Using GWAS and Array Data Detecting Associated Pathway and Shared Genomic Structure. The 81st Annual Scientific Meeting of the Japanese Circulation Society 2017.03.17

2. Mizuko Osaka, Masayuki Yoshida.. Neutrophil-depletion prevents development of atherosclerosis in LDLR null mice. The 81st Annual Scientific Meeting of the Japanese Circulation Society 2017.03.17 Kanazawa, Japan
3. Mizuko Osaka, Michiyo Deushi, Hiromi Tsuru, Masayuki Yoshida. Neutrophil plays an important role on the formation of atherosclerotic lesion. 2017.06.17 Tokyo, Japan

4. Mizuko Osaka, Michiyo Deushi, Hiromi Tsuru, Masayuki Yoshida. Neutrophil plays an important role on the development of atherosclerosis. 49th Annual Scientific Meeting of the Japan Atherosclerosis Society 2017.07.06 Hiroshima, Japan

[Others]

1. Grant-in-Aid for Young Scientists (B) JSPS KAKENHI (16K19048) S-nitrosylation, a novel posttranslational protein modification, mediated glycolipid metabolism disorder and chronic inflammation. 2016-2017

2. Takeda Science Foundation for Medical Research The missing link between the metabolic syndrome pathogenesis and chronic inflammation. 2016-2018

Forensic Dentistry

Professor Koichi SAKURADA
Assistant Professor Hajime UTSUNO
Assistant Professor Namiko ISHII
Graduate Student Saki MINEGISHI

(1) Outline

Forensic dentistry plays an important role in society through the use identification of victims after major accidents or disasters using dental findings, as well as the identification of cadavers or persons from biological samples in relation to crime. In particular, the establishment of two laws related to cause of death investigation in June 2012 further promoted research, identification, and education related to individual identification. The primary function of our laboratory is the identification of individuals from hard tissues such as teeth and bones, soft tissues, body fluids, or facial images, using the latest molecular biological and imaging techniques.

(2) Research

1. Individual identification
   ● Identification based on dental findings
   ● Identification using hard tissues such as teeth and bones, soft tissues, and body fluids
   ● Identification based on facial reconstruction and image analysis
2. Child abuse and neglect
3. Dental accidents and lawsuits
4. Problems associated with the dental care system
5. Forensic toxicology

(3) Education

We teach dental students a relation between death investigation systems and dentists and make them understand that society expects them as dentists to perform individual identification based on dental findings. Also, students are likely to have opportunities to assist the regional administrative and police activities in the future. To protect the rights of the deceased individuals and improve public health, dental students need to acquire basic knowledge about forensic medical sciences including postmortem changes and cause of death identification. To foster independent researchers, we teach graduate students the latest research directions in forensic dentistry and how to plan their own research project. In addition, students learn practical individual identification methods and their importance through forensic autopsy.

(4) Lectures & Courses

We believe that students learn more effectively in an environment where they can simultaneously conduct practical work and research.
(5) Clinical Services & Other Works

Forensic autopsy for the identification of cadavers and other related activities. Individual identification following accidents or disasters. Participation in disaster prevention and individual identification training programs held by various communities.

(6) Publications

[Original Articles]


[Books etc]

1. Koichi Sakurada. Teeth speak louder than words age estimation from teeth and bones. DENTAL DIAMOND, 2017.01

2. Koichi Sakurada. Teeth speak louder than words age estimation using the racemization and the radioisotope. DENTAL DIAMOND, 2017.02

3. Koichi Sakurada. Teeth speak louder than words sex estimation from teeth and bones. DENTAL DIAMOND, 2017.03


5. Koichi Sakurada. Teeth speak louder than words blood typing and DNA typing from a tooth. DENTAL DIAMOND, 2017.05

6. Koichi Sakurada. Synthesis of antidote candidates which are effective against sarin poisoning. CHEMISTRY, 2017.06

7. Koichi Sakurada. Teeth speak louder than words The powerful information that one tooth has and the future of forensic dentistry. DENTAL DIAMOND, 2017.06


[Misc]

1. Koichi Sakurada. Individual identification from saliva stains The Journal of Tokyo Dental Association. 2017.07; 65(7); 3-10


[Conference Activities & Talks]

1. Koichi Sakurada. What is the mission of forensic medicine and dentistry? private identification. The 6th Round-Table Conference with Reporters 2016 2017.02.16 Tokyo Medical and Dental University

2. Koichi Sakurada. What is the mission of forensic dentistry?. The 2nd Kyoto Forensuc Dentistry Seminar 2017.03.04 Kyoto Prefectual University of Medicine

4. Hajime Utsuno, Namiko Ishii, Saki Minegishi, Koichi Sakurada. Study on the subnasal point estimation from Japanese male skulls. The 101st Congress of the Japanese Society of Legal Medicine 2017.06.08 Nagaragawa Convention Center


7. Koichi Sakurada. Crime investigation Significance of clarifying the origine of a person. Open campus in Tokyo Medical and Dental University 2017.07.28 Tokyo Medical and Dental University

8. Hisako Saitoh, Ayaka Sakuma, Namiko Ishii, Hajime Utsuno, Saki Minegishi, Disuke Yajima, Go Inokuchi, Ayumi Motomura, Yousuke Makino, Fumiko Chiba, Suguru Torimitsu, Koichi Sakurada, Hirotaro Iwase. Three cases that postmortem Ct reconstruction images were effective for collecting dental findings. The 86 Kanto District Meeting of the Japanese Society of Legal Medicine 2017.10.28 Kyorin University


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[Social Contribution]

1. Individual identification using dental findings and others (79cases), 2017.01.01 - 2017.12.31

2. Individual identification training program for dentist (Second, Tokyo metropolitan) (Koichi Sakurada), Tokyo Dental Association, Tokyo Dental Association, 2017.02.09

3. Lecture of Hachinan Dental associatio (Koichi Sakurada), Hachinan Dental Association, 2017.11.13

4. 2th Individual identification training program (Namiko Ishii, Hjime Utsuno, Koichi Sakurada), Chiba University, Chiba Dental Association, Inohana Kaikann of Chiba University, 2017.11.26

5. 2017 Individual Identification training program (First, Tokyo metropolitan) (Koichi Sakurada), Tokyo Dental Association, Japan Dental Association Building, 2017.11.28
(1) Outline

The role of health care extends to improving such aspects of life as dietary habit and relationship with others, and is deeply connected to quality of life. Looking back, however, discussion on healthcare has too often originated from political dynamics and interests of parties involved, and not from the voices of general public. This is due partially to the lack of quality data available among the people. The reality of healthcare and what it brings to the society are not necessarily always clear to the general public. In terms of dental care especially, it is hard to say that enough evidences have been established and widely recognized among people to the extent that matches to its importance in providing quality life. Thus, we apply economics in conducting interdisciplinary review of healthcare along with other related fields, and pursue how the healthcare system should be for the people.

(2) Research

Research activities involve conducting analysis on phenomena and observations in health care from the viewpoint of macro as well as micro economics. Main focuses are:

1) Cross-sectional research on healthcare, dental care, nursing care, long-term care, and pharmaceutics from the viewpoint of economics
2) Proposals on policy making in efficient delivery of healthcare, nursing care, and long-term care
3) Borderless and mutual development of various specialties such as dental care, healthcare, economics, management and accounting.

(3) Education

Understanding the methods of research on phenomena and observations in health care field through economics point of view. As we have many part-time students with jobs as well as foreign students, the lecture will be centered around such topics as the approach to a research theme in economics and other social sciences (especially empirical studies), how to proceed with the research, and paper writing. Specifically, we will provide outline of healthcare economics by a weekly lecture for Ph. D. candidates as well as once a year lecture for the master course. Some of them adapt more interactive style of problem solving with input from visiting lecturers. Emphasis is placed on methods of quantitative analysis, learning both theoretical and empirical approaches to phenomena and observations in health care field through economics point of view. Lectures for undergraduate education will be focused on the outline of healthcare economics in dental care, with specific themes as 1) Economical analysis of dental healthcare, 2) Expenditure on dental care, 3) Reimbursement, and 4) Quality assessment of dental care.
(4) Lectures & Courses

Faced with recent changes in healthcare and long-term care, core hospitals and other healthcare related institutions in communities with responsibility of supporting front-line healthcare long for personnel competent in healthcare management. Call for such personnel is strong among research organizations and public offices as well, looking for those who are proficient in qualitative and quantitative analysis. Therefore, we aim to train students to be capable in making immediate contribution to the healthcare and welfare field, and to educate future 'academic doctors' who can voice their messages in policy making.

(5) Clinical Services & Other Works

Igarashi, Assistant Professor in our department, practices three times a week in the clinic for Oral Diagnosis and General Dentistry of the Dental Hospital. Findings from our research activities are shared to the public through papers, reports, lectures and symposiums in both academic and less academic settings. Comments on healthcare reform, for instance, have been televised on and printed in various media.

(6) Publications

[Misc]
1. Koichi Kawabuchi. Impact of fiscal Year 2016 Medical Fee Revision on Medical Institution Management Japan Hospitals. 2017.07; (36); 29-37

[Conference Activities & Talks]
1. G.M. Rabiul Islam, Koichi Kawabuchi. The economic and sociodemographic factors associated with infant and young child feeding practices in Bangladesh. The 12th Annual Conference of JHEA 2017.09.02
Dental Education Development

Professor: Ikuko MORIO
Assistant: Professor Naoko SEKI
Graduate Student: Chinatsu MATSUKAWA
Graduate Student: Akira TAKINAGA
Graduate Student: NGUYEN THI THANH TAM
Graduate Student: Mio NAITO
Graduate Student: Ai OSATO

(1) Research

1) Research on curriculum for health care professional education
2) Comparative study of domestic and international dental education
3) Research and development of educational methods in health care professional education
4) Research and development of English education programs in health care professional education

(2) Education

Main educational goal of this section as part of graduate school is to help students in health care sciences learn the basics of medical/dental curriculum: educational objectives, strategies and evaluation. This section is currently involved in the undergraduate dental education as the coordinators of multiple modules: the students’ research project, courses for global communication, and the electives including various English courses and courses for international exchange for dental students.

(3) Clinical Services & Other Works

[ Coordination for Seminar, Symposium, Workshop or other events]
1. Essential Expertise for Clinical Dentistry 2 (Seminar/Hands-on), Tokyo, Japan (TMDU). January 19, February 9, March 7 and 27.
2. Essential Expertise for Clinical Dentistry 3 (Seminar/Hands-on), Tokyo, Japan (TMDU). August 22-25, 29, 30.

(4) Publications

[Original Articles]

[Misc]


[Conference Activities & Talks]


2. The clinical and educational effects of the newly-introduced interprofessional clinical practice. 2017.05.13


6. KAWAGUCHI Y, TAKEHARA S, SEKI N, MORIO I, TAGAMI J. International short-term dental education program at Tokyo Medical and Dental University 1. Outbound program. 36th Annual Meeting of the Japanese Dental Education Association 2017.07.28 Matsumoto City

7. TAKEHARA S, KAWAGUCHI Y, MORIO I, SEKI N, TAGAMI J. International short-term dental education program at Tokyo Medical and Dental University 3. Effect of inbound and outbound programs. 36th Annual Meeting of the Japanese Dental Education Association 2017.07.28 Matsumoto City

8. MORIO I, SEKI N, KAWAGUCHI Y, TAKEHARA S, TAGAMI J. International short-term dental education program at Tokyo Medical and Dental University 2. Inbound program. 36th Annual Meeting of the Japanese Dental Education Association 2017.07.28 Matsumoto City

9. Nguyen TTT, Seki N, Moross J, Hosaka K, Sunaga M, Morio I, Kinoshita A. The effectiveness of newly developed computer-assisted simulation materials on overseas learners. The 28th SEAADE (South East Asia Association for Dental Education) Annual Scientific Meeting 2017.08.11 Taipei, Taiwan

[Awards & Honors]

1. Best Poster Award, Japan Society for Occupational Health, 2017.05

2. Advanced Education System Development(Kanako Noritake), Japanese Dental Education Association, 2017.07
Oral Health Promotion

Professor Yoko Kawaguchi
Associate Professor Masayuki Ueno
Assistant Professor Takashi Zaitsu
Assistant Professor Akiko Ohshiro
Office administrator Kyoko Kanetomi (from April)
Registered Resident Hiromi Nishiyama
Graduate Student
Nguyen Thi Hoang Yen (till September)
Yuka Shizuma
Kaung Myat Thwin
Toshiya Kanazawa
Takashi Tanemura
Jin Aoki
Mitsue Kamisawa
Zar Chi Kyaw Myint
Nguyen Thi Nhat Vy (from October)
Research Student
Tomoya Saito (from April)

(1) Research

Research Subjects
Research topics are innovative, academic and international research in the field of dental public health and preventive dentistry to proceed with oral health promotion that contributes to human health. The current main research themes are:
1. Epidemiology and prevention of dental disease
2. Oral health care system
3. Relationship between oral health and general health
4. Oral health promotion
5. Diagnosis and treatment system construction of oral malodor
6. International oral health

(2) Lectures & Courses

1) Graduate School Education, Oral Health Promotion
The educational purpose is to foster professionals in dental public health and preventive dentistry who can think oral health problems as related issues with living environment, life style, health policy and social condition, and can conduct innovative, academic and international research on oral health for maintaining and improving oral health.

2) Undergraduate School Education
The department is in charge of module units of “Introduction to dentistry”, “Environment and society II”
and “Comprehensive problem exercise” for the third year dental students, and module units of “Basis for dentistry”, “Prevention and health management I”, “Prevention and health management II” and “Dentistry and nutrition” for the fourth year dental students. The department is also in charge of “Experiential research exercise” for the fourth year dental students, and “Comprehensive clinical practice phase I & II” for the fifth and sixth year dental students, in cooperation with other departments.

(3) Clinical Services & Other Works

Clinical Services
“Fresh breath clinic” in Dental hospital, Tokyo Medical and Dental University is a special clinic for diagnosis, treatment and prevention of oral malodor. About half of oral malodor patients are referred from other departments in the dental hospital or outside dental clinics. Other patients visit the clinic by finding the information of the clinic from mass media such as the internet, newspapers and television.

For oral malodor examination, gas chromatography and gas sensor instrument are used to measure the concentration of volatile sulfur compounds (VSCs) along with the organoleptic test. Oral malodor is treated based on diagnosis by precise measurement and oral examination, besides psychological aspects of the patient are paid attention. Treatment of oral malodor needs continuous periodontal disease management and oral care in cooperation with oral care department in the dental hospital and patient’s family dentist.

(4) Publications

[Original Articles]


3. Takashi Zaitsu, Toshiya Kanazawa, Yuka Shizuma, Akiko Oshiro, Sachiko Takehara, Masayuki Ueno, Yoko Kawaguchi. Relationships between occupational and behavioral parameters and oral health status. Industrial Health. 2017.05; 55; 1-10


5. Yen Hoang Thi Nguyen, Masayuki Ueno, Takashi Zaitsu, Toai Nguyen, Yoko Kawaguchi. Caries arresting effect of silver diamine fluoride in Vietnamese preschool children International Journal of Clinical Preventive Dentistry. 2017.10; 13(3); 147-154


[Books etc]


2. Masayuki Ueno, Sachiko Takehara, Takashi Zaitsu, Akiko Ohiro, Yoko Kawaguchi. Dental license renewal and continuing dental education system in other countries Japan Journal of Dental Practice Administration. 2017.11; 52(3); 147-153

[Conference Activities & Talks]

1. Takashi Zaitsu, Yen Nguyen, Yoko Kawaguchi. The Relationship of Dental Diseases with Life style Related Diseases of Workers. The 95th General Session & Exhibition of the IADR 2017.03.22 the Moscone West, San Francisco, Calif., USA

2. Yen Nguyen, Masayuki Ueno, Takashi Zaitsu, Toai Nguyen, and Yoko Kawaguchi. Effectiveness of Silver Diamine Fluoride on Arresting Dental Caries. The 95th General Session & Exhibition of the IADR 2017.03.22 the Moscone West, San Francisco, Calif., USA

3. Masayuki Ueno, Yoko Kawaguchi. Association between height and dentition status. The 66th General Meeting of Japanese Society for Oral Health 2017.05.31

4. Kaung Myat Thwin, Takashi Zaitsu, Masayuki Ueno, Yoko Kawaguchi. Relationship between dental caries and oral health behaviors in Myanmar children. 2017.05.31


6. Ei Ei Aung, Masayuki Ueno, Takashi Zaitsu, Sayaka Furukawa, Yoko Kawaguchi. Effects of Tooth Brushing, Mouth Washing and Tongue Cleaning on Three Volatile Sulfur Compounds - A Randomized Clinical Trail -. The 12th JUNTHai Conference 2017.09.04


8. Present situation and future perspectives of Asian Academy of Preventive Dentistry. 2017.10.27


10. Takashi Zaitsu. Space Dentistry -Oral Health Promotion in Space and Antarctic Environments-. the 65th Annual Meeting of the Japanese Association for Dental Research 2017.11.19 Showa University, Tokyo, Japan
Sports Medicine and Dentistry

(1) Outline

Sport medicine/dentistry is a branch of clinical medical and dental sciences which deals with the clinical management of oral health of athletes and sports-active people, the safety measures of sports-related traumatic injuries and disorders, and medical and dental supports to improve athletic performance.

(2) Research

1) Oral health promotion of athletes and sports-active people
   (1) Field survey of oral health conditions in athletes and sports-active people
   (2) Changes of oral environment associated with physical and sporting activities
   (3) Influences of sports drinks and supplements on oral health
2) Safety measures of sports-related dental and maxillofacial traumatic injuries
   (1) Diagnosis and treatment techniques for sports-related dental and maxillofacial injuries
   (2) Development and innovation of sports mouthguard
   (3) Development and innovation of sports faceguard
   (4) Development and innovation of scuba diving mouthpiece
3) Correlations between occlusion and general motor functions
   (1) Biomechanical assessment of motor performance associated with occlusion
   (2) Electrophysiological analysis of neuromuscular function associated with occlusion
4) Correlations between occlusion and body posture
   (1) Effect of occlusion on static posture
   (2) Influence of occlusion on dynamic posture
5) Relations between mastication and occlusion and brain functions
6) Application of HBO therapy to sports-related dental diseases and traumatic injury

(3) Education

Academic classes for sports medicine/dentistry in undergraduate and graduate courses in undergraduate and graduate courses are listed as follows;
1) D1: Shigaku-Gaisetu
2) D3: Sogo-Kadai-Ensyu
3) D3: Rinsyo-Taiken-Jissyu
4) D4: Kenkyu-Taiken-Jissyu
5) D5: Hatten-Shika-Rinsyo/Sports Dentistry
6) D5-D6: Hokatsu Rinsyo-Jissyu Phase I to II
7) OH2: Kiso-Kagaku-Jissyu
8) OH3: Seijin-Koukuhoken-Eiseigaku
9) OH3-OH4: Konkuhoken-Eisei-Jissyu
10) OE4: Sports dental engineering
11) Master course: Kankyo-Syakai-Ishigaku
12) PhD course: Tokuron, Ensyu and Kenkyu-Jissyu of Sports Medicine and Dentistry
13) Clinical training course: Sports Dentistry

(4) Lectures & Courses

Main objectives of academic education programs of sports medicine/dentistry in from undergraduate to graduate courses is to provide the students to study the oral health conditions in athletes and sports-active people, the changes of oral environment associated with physical and sporting activities, the possible correlations between occlusion and general motor functions and body posture, the novel techniques of sports mouthguard and faceguard, the relations between mastication and occlusion and brain functions, and so on. Students are also taught to advanced knowledge on sports medicine/dentistry and up-to-date techniques to fabricate custom mouthguard and faceguard.

(5) Clinical Services & Other Works

Sports dentistry clinic in Dental Hospital of Tokyo Medical and Dental University offers comprehensive care and clinical management for athletes and sports-active people suffered dental diseases and traumatic injuries. Custom-fitted protective gears such as mouthguard and faceguard against sports-related dental and maxillofacial trauma are also handled for participants in contact sports such as a boxing, American football, rugby football, hockey, lacrosse, and martial art. Sports dentistry clinic is positioned as a dental branch of Clinical Center for Sports Medicine and Dentistry under TMDU Sports Science Organization. In addition, Our clinic maintains close cooperation with Japan Institute of Sports Science/National Training Center under Japan Sport Council.

(6) Clinical Performances

< Certified specialists >


Hiroshi Churei (1. JASA Sports Dentist certified by Japan Sports Association, 2. Dental specialist certified by JASD, 3. MG technical instructor certified by JASD)

Kairi Hayashi (1. Dental specialist certified by JASD, 2. MG technical instructor certified by JASD)

Sachiko Fujino (1. JASA Sports Dentist certified by Japan Sports Association, 2. Dental specialist certified by JASD, 3. MG technical instructor certified by JASD)

Yuriko Yoshida (1. MG technical instructor certified by JASD)

Aki Kanasaki (1. Sports dental hygienist certified by JASD)

(7) Publications

[Original Articles]


5. Shirako T, Churei H, Wada T, Uo M, Ueno T. Establishment of experimental models to evaluate the effectiveness of dental trauma splints Dent Mater J. 2017.11; 36(6); 731-739


[Misc]

[Conference Activities & Talks]


Educational System in Dentistry

Professor Kouji ARAKI
Associate Professor Jun TSURUTA
Junior Associate Professor( non-full time) Kouji IIDA
Hiroki KATAOKA
Graduate Student Moriyuki KATOH
Kazuki TAKAHASHI Akitaka HATTORI Kanako TODA
Graduate research Student Shunsuke OZAWA (~ 2017.3)
Secretary Satomi ITOH

(1) Outline

Main object of educational system in dentistry in the graduate course is to provide opportunity to study evaluation method for dental education curriculum, inspection method of the validity and reliability of the evaluation system for dental education, evaluation system compared between international and Japanese education level in undergraduate or after the graduation periods, and dental clinical skills improvement by the virtual reality simulation system.

(2) Research

1) The development of evaluation method for dental education curriculum
2) The development of inspection method of the validity and reliability of the evaluation system for dental education
3) The development of evaluation system compared between international and Japanese education level in undergraduate or after the graduation periods
4) The development of the program for dental clinical skills improvement by the virtual reality simulation system

(3) Education

The education to the postgraduate students performs a lecture, practice, and Lab.
The education to the undergraduate students performs of a lecture and practice of all human general oral diagnoses.

(4) Lectures & Courses

The aim of the lecture is to understand the purpose and method about the evaluation of dental education system. In addition, it is to understand the level and inspection method of international dental education. The aim of the practice is to understand a method of data analysis provided by the evaluation system for the dental education. In addition, it is to understand the comparison with the international education level.
The aim of the Lab is to manage the teaching materials developed for simulation education and is to understand
Public Health

the inspection method of the evaluation for new education system.

(5) Clinical Services & Other Works

In the Clinic of Oral Diagnosis and General Dentistry, University Hospital, we performs manner and oral diagnosis education, for a student during clinical training.

(6) Publications

[Original Articles]

1. Ken-ichi Tonami, Sachi Umemori, Hiroshi Nitta, Kouji Araki, Shiro Mataki. Changes in Student Evaluations of a Medical Ethics Class 3 Years Later. European Journal of General Dentistry. 2017.09; 6(3); 123-126

2. Yasuyuki Kimura, Ken-ichi Tonami, Shiro Mataki, Kouji Araki. Analysis of new outpatients’ responses to a survey of their reasons for visiting a dental clinic. European Journal of General Dentistry. 2017.10; 6(3); 111-114

3. Kanako NORITAKE, Jun TSURUTA, Ken-ichi TONAMI, Sachi Umemori, Shigeru ODA, Shiro MATAKI, and Kouji ARAKI. Development of Undergraduate Dental Student Interview and Diagnostic Skills during Clinical Practice of Medical Interviews The Journal of the Stomatological Society, Japan. 2017.11; 84(3); 103-110


[Conference Activities & Talks]

1. UMEMORI Sachi, Aida J, Tonami K, Tabuchi T, Araki K, Matakis S, Kondo K. The association between secondhand smoking and number of remaining teeth among older Japanese. The 27th Annual Scientific Meeting of the Japan Epidemiological Association 2017.01.27 Koufu

2. Ken-ichi Tonami, Shizuko Ichinose, Kazunobu Sano, Naohiko Iwasaki, Hidekazu Takahashi, Shiro Mataki, Kouji Araki. Analysis of the dentin surface after Xe excimer lamp irradiation. The 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco


5. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Mataki. Factor analysis of students’ perception of inter-personal relations during "Introduction to the behavioral science" class. 31th IADR-SEA 28th SEAADE 2017.08.10 Taipei

6. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Mataki. Effects of the Great East Japan Earthquake on students’ perception of inter-personal relations. ADEE Annual Conference 2017.08.23 Vilnius, Lithuania

7. Jun Tsuruta, Kanako Toda. Study for the qualifying system of member societies of Japanese Association for Dental Science. 2017.09.10 Tokyo

[Social Contribution]

1. The Journal of Dental Education, peer reviewer, 2015.08.01 - Now
2. European Journal of Dental Education, peer reviewer, 2017.09.01 - Now
Educational Media Development

Professor KINOSHITA Atsuhiro
Assistant Professor SUNAGA Masayo
Graduate Student MIYOSHI Tomoe
Graduate Student HOBO Koki
Graduate Student CAO Ridan
Graduate Student AKIYAMA Kyoko
Graduate Student HARADA Yusuke(April ~)
Graduate Student TAKENOUCHI Akane(April ~)
Graduate Student TAKATSUNA Yukiko

(1) Research

1) Development of computer-assisted clinical simulation system for medical and dental practice training.
   In our university, we executed the Establishment of Computer-Assisted Education System on Clinical Simulation
   for Medical and Dental Practice Training project, which was adopted as part of the Support Program for
   Distinctive University Education in 2005, and developed the computer simulation materials on clinical education
   by utilizing digital clinical data from our Medical and Dental hospitals. We have expanded our study into a
   new project, 'Progress of Computer-Assisted Simulation for Medical and Dental Practice Training. Computer-
   Assisted Simulation Promoting Clinical Inference, Decision-making, Problem Solving and Cooperation Abilities
   of Health Professionals', which was subsequently selected to be part of the Program for Promoting the University
   Education Reform in 2009 by the Ministry of Education, Culture, Sports, Science and Technology. After utilizing
   the simulation materials for our students, we will evaluate and analyze their educational efficacy. Furthermore,
   we will develop a computer-assisted clinical simulation system for the entire university.

2) Development of new education system using information and communication technologies for medical and
   dental students.
   At our university, we executed the Integration of Information and Communication Technologies into Clinical
   Training project, which was adopted as part of the Support Program for the Contemporary Educational Needs
   in 2007. The aim of this program is to integrate traditional educational methods with advanced information and
   communication technologies in order to allow clinical training, practical training and lectures to be effectively
   interlinked. By expanding digital content and employing an automatic visual recording system, we are planning
   to establish a digital archive of treatments and surgeries, demonstrations of dental techniques, lectures and
   student training. We will then launch an on-demand distribution system in order to incorporate this content
   into clinical education, which the students will be able to use for their self-evaluation and learning.

3) Development and utilization of an educational media for medical and dental students.
   • Development and Study of Dental Model and Kit for Practical Training:
     Dental and dental hygiene students must acquire skills for measuring periodontal pockets and must learn to
     identify the base of the pocket. However, few dental models are commercially available, and students cannot
     measure deep periodontal pockets by practicing on one another. Thus, we developed a new dental model with
     which the students can practice the probing of deep periodontal pockets, and plan to evaluate its effectiveness
     in training and evaluation of examiners.
   • Development of Composing and Screening System for Original 3D Movies from Operator’s Viewpoint:
     If students can experience and recognize three-dimensional space from the operator’s (instructor’s) viewpoint
     during their practice sessions and lectures, it would have educational benefits. Thus, we plan to develop a
Composing and Screening System for Original 3D Movies from an Operator’s Viewpoint. Furthermore, we will improve the quality of distance learning and remotely operated instruction using the superimposing method.

- Development of Dental Handpiece System with CCD camera:
  We plan to develop a system equipped with a CCD camera, mirror and reverse image units in order to allow students in the lecture room to observe dental treatment sites in real-time, thereby giving them a sense of being at a clinic.

(2) Education

We will assist graduate students in understanding new educational systems and media utilizing information-communication technologies, such as the computer-assisted education system, the e-learning system and the live broadcasting lecture system. We will also assist these students in mastering how to create related educational media and apply it to medical, dental, nursing and dental hygiene education, as well as interprofessional cooperation.

First-year students at the School of Dentistry, and first and second-year students at the School of Oral Health Care Sciences will learn to process media information and create media content, as well as how to search the Internet for information that is necessary for their study and research activities. They will also learn how to make use of various databases.

Fourth-year students at the School of Dentistry will acquire the practical knowledge, communication skills and attitude to build good relationships with patients by gaining clinical experience at an early stage. This practice consists of two units; clinical experience in the teaching clinic and the computer-assisted simulation practice. This experience will enhance the students’ abilities, enabling them to be effective clinicians.

(3) Publications

[Original Articles]

1. Tomoe Miyoshi, Koki Hobo, Masayo Sunaga, Atsuhiro Kinoshita. Effects of an interactive simulation material for clinical dentistry on knowledge acquisition. J. Med. Dent. Sci.. 2017.09; 64(3); 35-42

2. Koki Hobo, Kanako Noritake, Masayo Sunaga, Tomoe Miyoshi, Ridan Cao, Hiroshi Nitta, Yuji Kabasawa, Atsuhiro Kinoshita. Effectiveness of an interactive simulation material for clinical dentistry on knowledge acquisition and memory retention in dental residents J. Med. Dent. Sci.. 2017.12; 64(4); 43-52

[Conference Activities & Talks]

1. Nana Shiota, Masayo Sunaga, Toshiyuki Takahashi, Atsuhiro Kinoshita, Toshiaki Ueno. Effectiveness of interactive computer-assisted learning (CAL)material on sports-related dental trauma for knowledge acquisition. The 39th Asia Pacific Dental Congress (APDC), Final Program and Abstract Book, p229, 22-25 May 2017.05.22 Macau


3. Tam Nguyen Thi Thanh, Naoko Seki, Janelle Moross, Keiichi Hosaka, Masayo Sunaga, Ikuko Morio, Atsuhiro Kinoshita. The effectiveness of newly developed computer-assisted simulation materials on overseas learners . The 28th Annual Scientific Meeting South East Asia Association For Dental Education (SEAADE), 10-11 August 2017.08.11 Taipei
Insured Medical Care Management

Professor Masumi AI
J Associate Professor Junichiro ISHIOKA
Graduate Student Hiroshi KAWAMURA

(1) Outline

Our department supports an appropriate practice on insured medical care and billing for medical service fees at the TMDU medical hospital. We also focus on development of methodology and materials for education on medical insurance system and rules for insured medical treatment.

(2) Research

1) Development of methodology and materials for education on medical insurance system and rules for insured medical treatment.
2) Studies on management and supports for billing for medical service fees at insurance medical institutions.
3) Studies on affairs of medical insurance system and provision of medical services. In addition, the staff has been engaged in clinical studies and epidemiological studies on lipid metabolism, diabetes mellitus, atherosclerosis, laboratory medicine, and urology.

(3) Education

The staff has been in charge for education of social health insurance system and rules for insured medical treatment at the TMDU medical hospital (May 2016 and February 2017). A doctor course student is in his second year.

(4) Lectures & Courses

*Providing practical supports for an appropriate insured medical care in the clinical fields.
Providing individual support for an appropriate billing for medical service fees at the medical hospital.
We also focus on development of methodology and materials for education on medical insurance system and rules for insured medical treatment.

(5) Clinical Services & Other Works

The staff has been in charge for assisting appropriate medical fee claims, and also providing clinical service on diabetes, dyslipidemia, atherosclerosis, geriatrics, and Urology.
(6) **Clinical Performances**

As a managing section of the medical hospital, we collaborate all kinds of hospital workers practically and efficiently to provide an appropriate insured medical care.

(7) **Publications**

[**Original Articles**]


[Misc]

1. Masumi Ai. Triglyceride and HDL cholesterol as risk factors and the treatment targets for atherosclerosis 2017.04; 106(4); 725-734

[Others]

1. IRB Member, Sony Corporation 2012-
Department of Global Health Entrepreneurship

Professor: Keiko Nakamura, MD, PhD
Junior Associate Professor: Kaoruko Seino, PhD
JSPS Research Fellow: Md. Mosiur Rahman, PhD
International Researcher: Layla McCay, MBChB;
Research Fellow: AL-SOBAIHI Saber, RN, MPH, PhD
Graduate Student: Aya Anzai, RN; Omar Mohammad Mashal, MD;
Shiro Ochi, MSc, PhD; Tomoko Terada, MD;
Dasavanh Manivong, MD, MSc; Delgermaa Doshzeveg, MPH;
Iskander Isaaq Maro, MD, MPH; Hoang Thuy Linh Nguyen, MD, MPH; Ahmad Shekib Arab, MD;
Yuri Tashiro, MPH, MPH; Deogratius Bintabara MD, MSc; T J Robionson Moncetric, RN, MPH;
Kathryn Lizbeth Lucena Sionge, RN, RM; Tran Dai Tri Han, MD, MPH; Hue Man Vo, MD;
HASAN S M Mahmudul Hasan, DMD; Shayo Festo Kasmir, MD

(1) Outline

The department of Global Health Entrepreneurship seeks to elucidate physical, social, economic and cultural factors determining inequity in health. The department works closely with WHO and other international agencies to help develop guidelines of scientific evaluation and recommended practices.

(2) Research

Major Research Topics:
1) Transfiguration of the ecosystem and its interaction with human health
2) Socio-cultural factors determining health
3) Social entrepreneurship development through applying the Healthy Settings approach
4) Use of information technology to improve public health
5) International health workforce and trade in health services
6) Universal health coverage in ageing society

(3) Education

PhD programs

Our doctoral program provides a flexible curriculum that allows students to customize their research goals, methods, and activities based upon their own interests and preferences. Students on the Public Health Medicine (PHM) track of the Disease Prevention Global Leader Program (DP-GLP) attain the skills required for public health professionals with an international perspective. The program prepares them for leadership roles in public institutions. Advanced students from many countries around the world are now enrolled. All the classes are conducted in English, thus facilitating the acquisition of international communication skills.

A rich variety of educational activities have been arranged in the program. These include: individual discussion sessions with professors and other faculty members; field investigations; and seminars on various topics such as community health care, community medicine, public health policy, biostatistics, academic presentation, development of foreign language skills, and communication skills. Students work closely with faculty members
on an individual basis in setting the right direction for their research and confirmation of their progress.

Master Programs

Master degree students receive systematic intensive training that leads to the acquisition of broad expertise in the field of global public health. This program is open to students who have majored in any field.

(4) Lectures & Courses

The objective of our postgraduate education is to provide professional qualifications to high-caliber people who exhibit leadership in the advancement of public health and promotion of health on an international scale. The department helps students attain the knowledge, skills, attitude, and experiences that are necessary for competent health specialists and social entrepreneurs in healthcare.

By completion of the doctoral course, the participants are expected to be able to:

- Assess health and well being the populations in local, national, and international settings,
- Assess evidence to show effectiveness of health interventions, programs and strategies,
- Think strategically to develop local, national, and international policies,
- Manage projects to successful completion
- Demonstrate leadership in local, national, or international public health programs
- Communicate properly when listening, presenting, writing, and negotiating
- Pursue a full-cycle of an academic, public health research project
- Facilitate learning of staff, students, and colleagues, and
- Practice and respect professional ethics in a socio-culturally diverse environment.

(5) Publications

[Original Articles]


7. Isaac I Maro, Abigail M Fellows, Odile H Clavier, Jiang Gui, Catherine C Rieke, Jed C Wilbur, Robert D Chambers, Benjamin G Jastrzembski, John E Mascari, Muhammad Bakari, Mecky Matee, Frank


[Books etc]


[Conference Activities & Talks]

1. Seino K, Nakamura K, Oneil M.. Heat-coping practices and social interactions among elderly urban dwellers.. AASSA-SCJ Workshop 2017.03.02 Tokyo

2. Nakamura K.. Healthy Cities and Sustainable Development Goals.. Workshop on Healthy Cities and SDGs 2017.08.17 Phnom Penh, Cambodia


— 170 —
Geriatrics and Vascular Medicine

Professor: Under selection
Associate Professor: Eiji KANEKO
Junior Associate Professor: Masashi BEPPU
Assistant Professor: Yasuko ABE
Graduate Student: Kenji TOYOSHIMA, Marie NAKAMURA, Risa SUZUKI

(1) Research
1) Cell biological mechanisms of atherogenesis
2) Mechanisms involved in dyslipidemia
3) Mechanisms of aging and age-related diseases
4) Undergraduate and postgraduate education in geriatrics

(2) Education
1) Undergraduate education of medical students with a particular emphasis on geriatrics
2) Development of research on aging and age-related diseases with a particular emphasis on atherosclerosis

(3) Clinical Services & Other Works
As a division of the Department of Internal Medicine, we are taking care of elderly patients who are better treated by us rather than by highly specialized experts both at the outpatient clinics and the ward of our university hospital. We also provide subspecialty service such as oriental herbal medicine, mononuclear cell transplantation for PAD, and dyslipidemia clinic.

(4) Publications
[Original Articles]

[Conference Activities & Talks]

1. Sasaki M, Shinozaki S, Shimokado K.. Sulforaphane promotes murine hair growth by accelerating the degradation of dihydrotestosterone. The 8th IAGG Master Class on Ageing in Asia 2017.03.26
Rehabilitation Medicine

Associate Professor Tetsuya JINNO
Graduate Student
Chisato HOSHINO
Kazuko KATSUKI

(1) Research

Research Subjects
1) Rehabilitation for total joint arthroplasty
2) Three dimensional motion analysis of upper/lower extremities and gait analysis
3) Patient safety in rehabilitation medicine
4) Biomechanical research for prevention of sports injury

(2) Lectures & Courses

Purpose of Education:
Rehabilitation medicine consists of physical, occupational and speech therapy. Main theme of rehabilitation medicine in graduate course is to study 3-dimentional motion analysis in activities of daily living and molecular biological analysis of disuse atrophy.

(3) Publications

[Original Articles]


2. Gaku Koyano, Tetsuya Jinno, Daisuke Koga, Yuki Yamauchi, Takeshi Muneta, Atsushi Okawa. Comparison of bone remodeling between an anatomical short stem and a straight stem in one-stage bilateral total hip arthroplasty The Journal of Arthroplasty. 2017.02; 32(2); 594-600


5. Ryohei Takada, Tetsuya Jinno, Daisuke Koga, Atsushi Okawa. Comparison of wear rate and osteolysis between second-generation annealed and first-generation remelted highly cross-linked polyethylene in total hip arthroplasty. A case control study at a minimum of five years. Orthopaedics & Traumatology: Surgery & Research. 2017.06; 103(4); 537-541
[Conference Activities & Talks]
1. Ryohei Takada, Tetsuya Jinno, Kazumasa Miyatake, Takeshi Muneta, Atsishi Okawa. Comparison Of Wear Rate And Osteolysis Between Second-Generation Annealed And First-Generation Remelted Highly Cross-Linked Polyethylene In Total Hip Arthroplasty. 18th EFORT Congress 2017.06.01 Viena(Austria)

[Others]
1. Train-the-Trainer Program for OrthAlign Plus, 2017.06
   Hip Training Course @ OrthAlign
Gerodontology and Oral Rehabilitation

Professor
MINAKUCHI Shunsuke

Associate Professor
TOHARA Haruka

Junior Associate Professor
SEKITA Toshiaki, KOBAYASHI Ken-ichi, KUBOTA Kazumasa

Assistant Professor
AKIBA Norihisa, INOKOSHI Masanao, KANAZAWA Manabu, KOMAGAMINE Yuriko, MOTOMURA Kazuo, NAKANE Ayako, SATO Yusuke, WAKASUGI Yoko, OKUBO Mai

Project Assistant Professor
HAMA Yohei

Dental Resident
YOSHIZAKI Taro, NAKMURA Toshinari, HIRAYAMA Daisuke, INOUE Minoru, YOSHIZUMI Yuu, SATO Marie, KAMOCHI Go, OOWADA Gaku, SOEDA Hitomi, SUZUKI Hiroyuki, Hara Takeshi

Graduate Student
AMAGAI Noriko, ANNDOU Mariko, ARAKIDA Toshio, ASAMI Mari, BABE Yuuya, CHANTARAMANEE Ariya, DOIKE Midori, KAGIFUKU Yuko, KAIIDILIYA Yalikun, Sato Eriko, KHAING Myat Thu, KUROSAWA Yukiko, KYOSAKA Yuka, MATSUBARA Mariko, MATSUDA Yuhei, MIURA Akemi, MIYAYASU Anna, SHIMIZU Haruki, SHIMIZUBATA Makoto, SHINOZAKI Hiromichi, SHIMADA Ryoo, TAGASHIRA Itoe, TUN Min Bo, VO Lam Thuy, YAMAGUCHI Kouhei, YAMAZAKI Yasuhiro, YOSHIMI Kanako, YOSHINAKA Shin, HIROKO Namai, Awutsadaporn Katheng, Thaw Di Cho Too, KAKU Jakuenn, Negoro Masatoshi, SOEDA Yumika, HASEGAWA Syouhei, HADA Tamaki, HATANO Keita, HARA Yoshiko, YOSHIDA Saori

Student
HIGASHINAKAGAWA Anri, JOKO Natsuka, KANEKO Seiko, KAWASHIMA Mina, NAMIJI Chizuru, NISHIKI Gen, NISHIYAMA Yui, OKANO Sakiko, TAKADA Shintaro, TAMURA Atsuko, UEDA Kaori, UENO Taro, Tsugawa Eriko, YAGUCHI Shiiho, SAI TUN NAING, KONISHI Emi, KAWAI Yosuke, KAWAKATSU Miri, OBARA Mana, IMADA Ryoko, HAYASHI Ayano, YOSHII Eiji

Staff
YAJIMA Yuriko, YOSHIZAKI Ayaka, TERADA Mito, FUKUSHIMA Rie

(1) Research

1) Medical management of Elderly Patients During Dental Treatment
2) New Examination Method for Dry Mouth
3) Oral Stereognosis Ability in the Elderly
4) Threshold of Mucous Membrane under Denture Base in Elderly Oral Mucosa Patients
5) State of the art Lasers in Zirconia Prosthetic Processing and Pain-free Treatment
(2) Education

Given the increased health needs of an aging society, we aim to integrate diverse clinical specialties related to geriatric dental practice and to educate individuals of fundamental studies in each field. We emphasize a comprehensive approach to patient interactions by examining daily life functionality rather than focusing only on their diseases.

With regard to dysphagia, which can lead to aspiration pneumonia, we provide comprehensive education on causes, diagnostic methods, and rehabilitation options from a dentistry point of view. Since we regard rehabilitation as the medicine of daily living, we emphasize that dysphagia rehabilitation should be considered a method to ameliorate disability rather than diseases by introducing practical approaches in addition to factual knowledge.

(3) Clinical Performances

We manage the prosthodontic, special care and dysphagia rehabilitation departments.

(4) Publications

[Original Articles]


2. Shoko Oba, Haruka Tohara, Ayako Nakane, Makoto Tomita, Shunsuke Minakuchi, Hiroshi Uematsu. Screening tests for predicting the prognosis of oral intake in elderly patients with acute pneumonia. Odontology. 2017.01; 105(1); 96-102

3. Khaing Myat Thu, Vo Lam Thuy, Manabu Kanazawa, Shunsuke Minakuchi. Evidences of Applicability of Implant Supported Overdentures during Present Decade; A Review. Myanmar Dental Journal. 2017.01; 24(1); 32-41

4. Chieko Kubota, Manabu Kanazawa, Yohei Hama, Yuriko Komagamine, Shunsuke Minakuchi. Association between chewing-stimulated salivary flow under the effects of atropine and mixing ability assessed using a color-changeable chewing gum. J Prosthodont Res. 2017.01; 61(4); 387-392

5. NAKAMURA Toshinari, AKIBA Norihisa, TANIMOTO Hiroyuki, HIRAYAMA Daisuke and MINAKUCHI Shunsuke. Influence of a home reliner on denture displacement and patient reported outcome. 2017.03; 84(1); 8-18


9. Taro Yoshizaki, Norihisa Akiba, Masanao Inokoshi, Masayuki Shimada, Shunsuke Minakuchi. Hydrophilic nano-silica coating agents with platinum and diamond nanoparticles for denture base materials. Dental Material Journal. 2017.05; 36(3); 333-339


17. Hitomi Soeda, Yusuke Sato, Eijiro Yamaga, Shunsuke Minakuchi. A structural equation model to assess the influence of neuroticism on oral health-related quality of life in complete denture wearers. Gerodontology. 2017.12; 34(4); 446-454

18. Mai Okubo, Yusuke Sato, Yuki Hirajima, Shunsuke Minakuchi. Learning effects of different training models for border molding from the perspective of dental students. BMC Oral Health. 2017.12; 17(1); 152


[Conference Activities & Talks]


2. Minakuchi S. Mastication will contribute to healthy longevity. 37th Myanmar Dental Conference 2017.01.20 Yangon


5. Hiroyuki Suzuki, Manabu Kanazawa, Noriko Amagai, Yuriko Komagamine, Maiko Iwaki, Ayami Jo, Shunsuke Minakuchi. Effect of simple dietary advice combined with denture fabrication by dentist on nutrient intake of edentulous elderly. The 71th Annual Meeting of Japan Society of Nutrition and Food Science 2017.05.20 Okinawa


7. Seiko Kaneko, Minoru Inoue, Marie Sato, Akiko Takahashi, Anri Higashinakagawa, Eriko Tsugawa, Shihio Yaguchi, Toshiaki Sekita. A Case of Odontorrhagia after a Tooth Extraction due to Poor Control of Warfarin. The 28th Annual Meeting of Japanese Society of Gerodontology 2017.06.15 Nagoya


10. Inokoshi M. Basic knowledge of contemporary CAD/CAM and ceramics materials. TMDU Exciting Room 2017.06.17 Tokyo

11. Iwaki Maiko, Kanazawa manabu, Miyayasu Anna, Sato Daisuke, Kasugai Shohei, Minakuchi Shunsuke. Prospective study of immediate Loaded two-implants mandibular overdentures: 5-years follow up. 2017.06.30 Yokohama


21. Minakuchi S. Long-term care insurance system on oral health in Japan : the system and new challenges. 31st IADR-SEA 2017.08.13 Taipei International Convention Center, Chinese Taipei


25. K Yamaguchi, H Tohara, A Nakane, K Hara, S Minakuchi. EFFECT OF AGING, TOOTH LOSS, PTERIORAL MUSCLE MASS AND SKELETAL MUSCLE MASS ON OCCLUSAL FORCE IN HEALTHY ELDERLY. 7th ESSD Congress and World Dysphagia Summit 2017.09.21 Barcelona


27. Hiroyuki Suzuki, Manabu Kanazawa, Noriko Amagai, Yuriko Komagamine, Maiko Ikahi, Shunske Minakuchi. The effect of new complete denture fabrication combined with simplified dietary advice on protein intake of edentulous elderly. The 28th general meeting of Japanese Society for Mastication Science and Health Promotion 2017.09.23 Tokyo


[Awards & Honors]

1. Best Paper Award in Junior Scientist Session (Khaing Myat Thu), 37th Myanmar Dental Conference, 2017.01

[Others]

   Hands-on course

2. Kobayashi K, Principle of tooth preparation, 2017.05
   Hands-on course
Laboratory Medicine

Professor Shuji TOHDA  
Assistant Professor Mai ITOH  
Graduate Students Mika OHTAKA, Erika SHIRATORI, Yuki KODA

(1) Outline

Laboratory medicine is a field of research to develop analytical methods of pathophysiology of various diseases, new diagnostic tests, and diagnosis-supporting system using laboratory tests.

(2) Research

Our research subjects are as follows:  
1) Cellular and molecular mechanism of abnormal growth of acute leukemia cells and drug-sensitivity tests for molecularly targeted therapy  
2) Molecular diagnostic tests for cancer and detection of minimal residual cancer cells  
3) Mechanism of abnormal growth of lymphoma cells  
4) Molecular diagnostic tests for infectious diseases

(3) Education

To graduates students, we provide opportunity to study and develop novel diagnostic tests using cellular and molecular biological technique in our laboratories.  
To undergraduate students, we give a lecture and practical training on laboratory medicine.

(4) Lectures & Courses

Main objective of Laboratory Medicine in the graduate course is to provide students opportunity to study analysis of pathophysiology, development of new diagnostic tests, and establishment of diagnosis-supporting system using laboratory tests. We focus on the analysis of pathophysiology of hematological malignancies and the development of molecular diagnostic tests for cancer and infectious diseases.

(5) Clinical Services & Other Works

We are performing laboratory tests for hematology, clinical chemistry, immunology, and microbiology in cooperation with doctors and technologists of clinical laboratory in University hospital. We give a lecture on laboratory tests at meetings of laboratory medicine-related societies.

(6) Clinical Performances

We are developing new diagnostic methods collaborating with various clinical departments. We are also supporting them in their diagnostic procedure.
(7) Publications

[Original Articles]


2. Yuki Okuhashi, Mai Itoh, Shuji Tohda. Hedgehog Stimulation Suppresses Clonogenicity and Activates NOTCH Signalling in T-lymphoblastic Leukaemia Jurkat Cells. Anticancer Res.. 2017.05; 37(9); 5005-5009


5. Erika Shiratori, Mai Itoh, Shuji Tohda. MYD88 Inhibitor ST2825 Suppresses the Growth of Lymphoma and Leukaemia Cells. Anticancer Res.. 2017.11; 37(11); 6203-6209

6. Mika Ohtaka, Mai Itoh, Shuji Tohda. BMI1 Inhibitors Down-regulate NOTCH Signaling and Suppress Proliferation of Acute Leukemia Cells. Anticancer Res.. 2017.11; 37(11); 6047-6053

[Conference Activities & Talks]

1. Mika Ohtaka, Mai Itoh, and Shuji Tohda. BMI1 inhibitors suppress cell growth and NOTCH signalling of acute leukemia cells. 46th Annual Scientific Meeting of the International Society for Experimental Hematology 2017.08.26 Frankfurt, Germany
Critical care medicine provides intensive care and treatment for critically ill patients. To treat critically ill patients, intensivists have to catch the changes of the patients’ condition by monitoring and evaluation, and practice appropriate therapy. It is important that intensivists practice minute-to-minute titration therapy in cooperation with other multidisciplinary professionals.

Practice of critical care medicine includes intensive care for various types of shock, acute respiratory distress syndrome/acute lung injury, sepsis, multiple organ dysfunction syndrome, abnormal acid-base balance, electrolyte disturbance, acute kidney injury, central nervous system dysfunction, and hospital-acquired infection, mechanical ventilation, pharmacological support, cardiopulmonary support system, blood purification, and nutrition support.
(2) Research

Our themes of research are derived from clinical questions in critically ill patients.
Clinical research:
1) Effective Medical Creation (EMC) project, in liaise with Yamaha Co. and world-renowned designer Hiroko Koshino.
Basic research:
1) Role of microvesicles in patients on ECMO (Shiota, funded by Grant-in-Aid for Young Scientists B)
2) Role of microvesicles in bronchopulmonary dysplasia (Wakabayashi, funded by Grant-in-Aid for Young Scientists B)
3) Role of urinary microvesicles in acute liver failure (Wakabayashi, funded by National Center of Child Health and Development)

(3) Education

Undergraduate education
Lectures: Fourth-year medical students
1) Mechanical ventilation (Wakabayashi)

Clinical clerkship: Fifth-year and Sixth-year medical students
Critical care medicine is a branch of faculty of medicine which deals with monitoring and care of critically ill patients. Main objective of critical care medicine is to provide students opportunity to study diagnosis and treatment of critically ill patients in the intensive care unit (ICU). Students are taught on clinical practice in the ICU. Students take charge of 1-2 patients with attending physician and intensivist. Students do an oral presentation at ICU educational rounds.
Conference: Students are assigned to read recent articles of critical care medicine and make presentations by power point at the conference.
Residents: Residents in training rotate the ICU for 2-3 months. They study respiratory, circulatory, and metabolic management of critically ill patients. They learn how to use ultrasound and bronchoscope.

(4) Lectures & Courses

US-based training system has been in place at the Department of Intensive Care Medicine under the Prof Shigemitsu who was a program director of ACGME-accredited fellowship program at the University of Nevada. We regularly hold educational conferences on every Tuesday called ‘academic day’.

(5) Clinical Services & Other Works

Intensivists are staying in the ICU, and take charge treatment of critically ill patients in the ICU.
Every morning, intensivists, nurses, pharmacist, nutritionist, rehabilitation staffs, infection control staffs, medical engineers, and attending physicians get together, go round, and talk about the best treatment of the patients. From March 2017, we also started a novel Rapid Response System (we named as RAS: Risk Assessment System), in collaboration with the Department of Acute Critical Care and Disaster Medicine.

(6) Clinical Performances

Our early rehabilitation program based on the multidisciplinary round was awarded a ‘best team prize’ in 2017, and presented at an invited seminar at the national conference of Japanese Society of Respiratory Care Medicine.

(7) Publications

[Original Articles]
1. Michael Wilson, Kenji Wakabayashi, Szabolcs Bertok, Charlotte Oakley, Brijesh Patel, Kieran O’Dea, Joanna Cordy, Peter Morley, Andrew Bayliffe and Masao Takata. Inhibition Of TNF Receptor p55 By


[Books etc]

[Misc]

[Conference Activities & Talks]
1. Kenji Wakabayashi. Role of inflammation in ventilator-induced lung injury. Education seminar for specialist in neonatology 2017.05.13 Sendai

[Awards & Honors]
1. Top Doctors, Vegas Seven Magazine, 2017.02
2. Best ICU doctor, University Medical Center, Las Vegas, Nevada, 2017.03
3. Las Vegas Sun Health Care Quarterly: Top Doctors, Vegas Inc, 2017.05
Liaison Psychiatry and Palliative Medicine

Outline

The purpose of the section is to help understanding characteristics of psychosocial distress in patients with physical and mental disorders from a comprehensive viewpoint. Objects are mainly physical patients accompanied with pain, anxiety, depressive mood and so on. Students study these patients’ symptoms, how to diagnose, practice of treatment and methods of preventive measures.

Research

1) Assessment of mental state in cancer and other physical patients using written questionnaire
2) Research on quality of life (QOL) in cancer patients and their families
3) Investigation cognitive function of patients with organic disorders (SLE, diabetics, and so on) undergoing a battery of psychometry tests and neuroimaging examinations
4) Explanation for the relationship between physical symptoms and mental states in patients with psychoso-
matic diseases including chronic pain and irritable bowel syndrome (IBS).
5) Examination for physiological phenomenon of psychiatric patients using eye mark recorder, electroencephalogram (EEG) and functional MRI (fMRI)

(3) Clinical Services & Other Works

Psychosomatic clinic provides consultation-liaison psychiatry services at the request of the treating medical or surgical staffs. Patients accompanied with insomnia, anxiety, depressive mood and delirium are treated with psychotherapy and prescription medicines.

(4) Publications

[Original Articles]


9. Jun Kako, Masamitsu Kobayashi, Yusuke Kanno, Keita Tagami. Intranasal Vinegar as an Effective Treatment for Persistent Hiccups in a Patient With Advanced Cancer Undergoing Palliative Care. J Pain Symptom Manage. 2017.08; 54(2); e2-e4


[Conference Activities & Talks]


3. Saori Koshimoto, Masako Arimoto, Keiko Saitou, Mayumi Uchibori, Akiko Hashizume, Yasuaki Nakajima and Eisuke Matsushima. Need for nutritional counselling by patients receiving outpatient chemotherapy. 19th World Congress of International Psycho-Oncology and Psycho-Social Academy 2017.08.17

4. Umezawa S, Fujimori M, Matsushima E, Kinosita H, Uchitomi Y. Preferences of advanced cancer patients for communication on anticancer treatment cessation and the transition to palliative care. 19th World Congress of Psycho-oncology and Psychosocial Academy 2017.08.17

5. Ichikura Kanako, Yamashita Aya, Matsuoka Shiho, Nakayama Nao, Ariizumi Yousuke, Sumi Takuro, Sugimoto Taro, Asakage Takahiro, Matsushima Eisuke. Stress coping skill training for patients with head and neck cancer: Interim report of a randomized controlled trial. 19th World Congress of Psycho-Oncology and Psychosocial Academy 2017.08.18 Berlin, Germany

Pharmacokinetics and Pharmacodynamics

Associate Professor Masashi Nagata
Research student Xue Bingyang

(1) Research

1) Kinetics of drug action in disease states
2) Therapeutic drug monitoring and clinical pharmacokinetics

(2) Education

Department of Pharmacokinetics and Pharmacodynamics is in charge of the education of pharmacokinetics and pharmacodynamics for the establishment of safe and effective drug therapy. In the graduate course, the lecture on the recent progress of the pharmacokinetic analysis will be given. Students will have the practice of pharmacokinetic analysis and animal experiments.

(3) Publications

[Original Articles]

[Conference Activities & Talks]
Medical Education Research and Development

Professor Yujiro TANAKA
Junior Associate Professor Makoto TAKAHASHI
Junior Associate Professor Eriko OKADA
Junior Associate Professor Yasuhiro ITSUI
Junior Associate Professor Toshifumi KUDO
Senior Resident Fukiko KITAHATA

(1) Outline

Department of General Medicine was established in 2000, when Prof. Yujiro Tanaka assumed the role of chairman of the department. Since then, our aim has been to coordinate and support a wide range of new innovations for the department of medicine and its affiliated hospitals. Accordingly, we launched the following projects to carry out our mission: 1) Designing a new postgraduate clinical training program for TMDU affiliated hospitals, 2) Forming a patient support system including social casework, 3) Establishing the Center for Cell Therapy, and 4) Reforming undergraduate medical education.

In response to the expansion of our activities, we have had some reforms in our organizations. 1) We founded the Center for Postgraduate Medical Education in 2002. (Director: Prof. Tanaka. Associate Director: Dr. Masanaga Yamawaki/former, Dr. Yoshitomo Momohara/former, and Dr. Makoto Takahashi/previous) 2) In 2002, we also established the Center for Health and Welfare. And two years later in 2004, it was developed into an independent center as the Department of Medicine when Dr. Masayoshi Shichiri was appointed as the Director. 3) The Center for Cell Therapy, which was first established as a part of the Blood Transfusion Department in March, 2001, became an independent organization in 2003. Then Dr. Tomohiro Morio became the director. 4) Prof. Tanaka became a member of the Board of Education and worked at the committee for curriculum renovations in the Department of Medicine. Then he became the chair of the Education Committee in 2004.

In addition to the curriculum reforms, the Department of General Medicine has been in charge of early clinical training, PBL implementation, supervising patient-doctor communication education, OSCE (objective structured clinical examination) preparation, and BSL (bedside learning). We have also promoted educational alliances with Harvard University since 2002 and with Imperial College, London since 2003.

As mentioned above, a couple of years after their launch, the Center for Health and Welfare and the Center for Cell Therapy became independent from the Department of General Medicine. Meanwhile, new working groups were formed within the department in 2004: the Working Group for Ward Management and the Safety Management Committee. The Department of General Medicine also devised an evaluation system for the residency training program (EPOC), which was later adopted as a national online evaluation system for postgraduate clinical training. We are working in close cooperation with Center for Interprofessional Education which we took in part of its establishment to materialize the interprofessional education introduced due to a revision of new curriculum in 2011.

(2) Research

Research on continuing education in clinical EBM (Tanaka)

Although the theory of EBM (Evidence-Based Medicine) has become common knowledge, there are many practical problems yet to be solved. Research on teaching and assessment techniques for under-and post-
Comprehensive Patient Care

Undergraduate Education
As a division, which is responsible for the education of students and residents, our primary goal is to foster doctors who have both a 'patient-centered perspective as a specialist' and 'up-to-date knowledge as a generalist'. To achieve our goal, we are designing and offering a continuing medical educational (CME) program for clerkship students, emphasizing on educational systems spreading among multiple departments. Since we think it is crucial to foster medical prospective with a patient-centered perspective, we introduced an early exposure course (MIC: Medical Introductory Course) for the 1st and 2nd year medical students, as well as some medicine oriented English courses, including a special course titled 'Language and Philosophy of Western Medicine' regarding some of the needs of this globalized era of medicine. In addition, we are managing a training course for simulated patients who can contribute to medical education cooperating with the International Center for Medical Education at the University of Tokyo. To improve the quality of clinical training, we are currently developing an evaluation system for tutors and trainers.

Postgraduate Education (Clinical Training)
Our department has offered the postgraduate clinical training since 2004 according to the new national residency system in Japan. We have also played an important role in developing the online evaluation system for postgraduate clinical training (EPOC), which is used in 60% of education hospitals in Japan. Results of the questionnaire in Match, 2013 showed one of the highest satisfaction rate among all national universities.

Postgraduate Education (Master’s degree courses)
We have been offering master’s degree courses in Medical Administration since this MMA program started in 2004, and were in charge of two courses this year, “Human resources management” and “Leadership in the medical care.”

Clinical Services & Other Works
Second Opinion (Itsui)
Our hospital is open to the public who ask for second opinions about their recommended treatments so that we can continue to contribute to the provision of safe and high-quality advanced medical technology. Over 300 consultation cases have been performed for patients coming from other hospitals nationwide. The purpose of this section is to assist the patients to exercise their right of self-determination and to be informed of new treatments and diagnostic tests. To provide a qualified second opinion, we have organized the network of specialists in TMDU.

Patient Safety (Kudou)
Dr.Ooka is the General Risk Manager of our university hospital, and our department regularly organizes seminars and training courses. In collaboration with other departments (e.g., Skills Laboratory Center, Infectious Control Committee, etc.), we are working for greater safety and quality of healthcare.
(5) Publications

[Original Articles]

[Conference Activities & Talks]
5. Igari K, Kudo T, Toyofuku T, Inoue Y. The relationship between inflammatory biomarkers and ischemic severity of patients with peripheral arterial disease. 85th EAS Congress 2017.04.24 Prague (Czech Republic)
6. Igari K, Kudo T, Toyofuku T, Inoue Y. The endovascular procedures of abdominal aortic aneurysms with challenging neck anatomy. 66th ESCVS 2017.05.14 Thessaloniki (Greece)
7. YOHEI FURUMOTO, AKIHIRO ARAKI, SAYURI NITTA, HIROKO NAGATA, KENTO TAKENAKA, KOUHEI SUZUKI, ERIKO OKADA, TAKAO HORIUCHI, MAMORU WATANABE. Report of successful rescue of disrupted caps after rule endoscopy retention. Asian Pacific Digestive Week 2017.09.26 Hongkong
Acute Critical Care and Disaster Medicine

Professor Yasuhiro Otomo

(1) Outline

1. Purpose of Education
We, the department of acute critical care and disaster medicine, investigate following wide range of fields, such as the search for mechanisms of biological response to severe stresses, the development of strategy for multiple organ dysfunction from the view of intensive care medicine, basic and clinical research about trauma, trauma preventive medicine and disaster medicine. Our targets of research are practical and cutting edge to work not only as a medical scientist but as a researcher for government projects.

2. Research Subjects
Basic research of the mechanism of multiple organ dysfunction following hemorrhagic/septic shock
Development of strategy for multiple organ dysfunction
Basic and clinical research of multiple trauma
Trauma epidemiology and trauma preventive medicine
Disaster medicine
Clinical research of cerebrovascular disease on acute phase

3. Clinical Services
Our emergency center was authorized to hold the 21st level I center in Tokyo on April 1, 2007. We give treatments over 8000 patients annual who are under critical condition like multiple organ dysfunction, severe sepsis and septic shock, life-threatening trauma as well. We also contribute to medical services, rushing to the emergency scene by a Doctor-Car/Helicopter at times.

(2) Publications

[Original Articles]

1. Akira Endo, Atsushi Shiraishi, Hiroki Matsui, Kenichi Hondo, Yasuhiro Otomo. Assessment of Progress in Early Trauma Care in Japan over the Past Decade: Achievements and Areas for Future Improvement. J. Am. Coll. Surg.. 2017.02; 224(2); 191-198.e5

2. Akira Endo, Atsushi Shiraishi, Kiyohide Fushimi, Kiyoshi Murata, Yasuhiro Otomo. Increased Severe Trauma Patient Volume is Associated With Survival Benefit and Reduced Total Health Care Costs: A Retrospective Observational Study Using a Japanese Nationwide Administrative Database. Ann. Surg.. 2017.06;


5. Akira Endo, Atsushi Shiraishi, Shigeki Kushimoto, Yasushiyo Otomo. Verification of conventional criteria of the lethal triad and development of novel criteria as an indicator of decision making
Clinical Oncology

(1) Outline

Department of Clinical Oncology was established in May 2012 to promote the field of palliative medicine and cancer chemotherapy according to “Training Program for Next Generation Specialists to Promote Cancer Therapy”. As for the education in medical school, we are involved in the course of Hematology-Oncology block and have a class of palliative medicine in the third year grade. In addition, we have a class of clinical ethics mainly focusing on the end-of-life care. As for the post-graduate education, we organized the “Training Program for Next Generation Specialists to Promote Cancer Therapy”.

(2) Research

1) Application of palliative care when the patient is diagnosed as cancer.
2) Improvement of QOL in the end-of-life care of cancer patients.
3) Communication skills in the team health care.
4) Multi-institutional research in pancreatic cancer treatment.
5) The role of biomarkers for newly developed anti-cancer drugs in lung cancer.

(3) Education

1) Hematology/Oncology
2) GI tract cancer
3) Lung cancer
4) Ethics
5) Communication

(4) Clinical Services & Other Works

Department of Clinical Oncology manages Cancer Center of the medical school hospital. There are five divisions below.
1) Division of palliative medicine
2) Division of cancer chemotherapy
3) Division of cancer registry
4) Division of coordination of cancer treatment
5) Division of cancer consultation and support
Dentistry for Persons with Disabilities

Associate Professor
Osamu SHINOZUKA

Junior Associate Professor (Part-time)
Minoru INADA
Goro SEKIGUCHI
Naoki HAYASHI
Yohei TAKEUCHI
Syohei TAMURA
Moriyuki NAKAMURA

Assistant Professor
Yasuka KUSUMOTO

Graduate Student
Aiko HOSHIAI

Hospital Staff
Taiji HOSHIAI
Ayana NATORI
Anna KUMAKUra
Hirotoshi Yamawaki

Clinical Junior Associate Professor (Part-time)
Seiji SAKURAI
Tomo SUZUKI
Yosuke KINOSHITA

(1) Research
1) Formation of oral biofilm
2) Elimination of oral biofilm of persons with disabilities
3) Oral health status of the medically compromised patients
4) Oral management of genetic syndrome

(2) Lectures & Courses

Our department was started as a graduate course of the special dentistry section on April, 1999. The sections are the dentistry for persons with disabilities and medically compromised individuals. The main objective of this course is to provide the opportunity for students to understand the outline of the reconstruction of functional and esthetic disorders of oral and/or maxillofacial areas by means of the high-advanced dental cares for patients with special needs.
(3) **Clinical Performances**

The clinical purpose of our department is to treat oral problems of special patients who are unable to receive normal dental care by reason of a disability which may be physical, mental, medical, or emotional, or combination of any of these under using behavior management and systemic support.

For example,  
1) The patients requiring behavior management are physically disabled, intellectual disability, autistic spectrum disorder, etc.  
2) The patients requiring systemic support are internal impediment, dental phobia, etc.

(4) **Publications**

[**Original Articles**]

1. A modal analysis of fixed implant supported prosthetic device of the six abutments placed in edentulous maxilla Japanese Journal of Maxillo Facial Implants. 2017.12; 16(4); 275-283

[**Books etc**]


[**Conference Activities & Talks**]

1. A case report of the systemic management by clear sight system ® and transthoracic echocardiogram during dental treatment in a patient with dilated cardiomyopathy. 2017.03.03  
2. Modal analyses of the maxillary dentition with maxillary cast obturator prostheses comparing different retainer types of metal frameworks. 2017.07.01  
3. The survey on dental-treatments under intravenous sedation in the clinic for patients with disabilities at the dental association. 2017.10.28  
4. Dental treatment in a patient with hypertrophic obstructive cardiomyopathy. 2017.10.28
General Dentistry

Associate Professor Shigeru ODA
Junior Associate Professor Masayuki HIDESHIMA
Junior Associate Professor Ken-ichi TONAMI
Assistant Professor Sachi UMEMORI
Assistant Professor Kanako NORITAKE
Hospital Staff Shuuhei NAKAMURA
Hospital Staff Yuko MITSUMA
Hospital Staff Maiko IWAKI
Hospital Staff Yasuyuki KIMURA
Hospital Staff Shota HAYASHI
Hospital Staff Naoki ISHIHARA
Hospital Staff Kiichi MARUYAMA
Hospital Staff Shogo MAEKAWA

(1) Outline

Recent dentistry is sectionalized into various specialized fields of research and education. On the other hand, as a general practitioner, a dentist must possess not only integrated knowledge and skills of all the fields but also should be competent to apply such generalized knowledge and skills to individual patients. The department of General Dentistry performs researches and education for practicing such general and holistic dentistry. General dentistry related to clinical and affective education for dental students and residents. Therefore, the research theme includes dental education as well as oral diagnosis and general dentistry, cooperating with the department of Educational System in Dentistry, Behavioral Dentistry and Educational Media Development. Researches for sleep apnea syndrome have been also conducted in association with Dental Clinic for Sleep Disorders. The clinic of department of General Dentistry is Oral Diagnosis and General Dentistry which missions in the Dental Hospital are initial diagnosis for new outpatients and general dental practice. Clinics of General Dentistry 1 and 2, where dental students and residents are trained, also relate to the department of General Dentistry.

(2) Research

Recent research themes are listed below.
1. Study for structure of health problems and treatment planning for dental patients.
2. Study for verification and improvement of oral diagnosis.
3. Study for dental education for dental students and residents.

(3) Education

The educational objective of General Dentistry is that the students/residents acquire transversal academic framework of dental knowledge and skills and competency to provide patients with personalized treatment.
(4) Lectures & Courses

1. Introduction to the Behavioral Science. (For the 2nd-year dental students)
2. Holistic Oral Diagnosis. (For the 5th-year dental students)
3. Comprehensive Clinical Training Phase I Phase II. (For the 5th and 6th-year dental students)
4. Clinical training (For the dental residents)

(5) Clinical Services & Other Works

The clinic of department of General Dentistry is Oral Diagnosis and General Dentistry. In the clinic, dental examination and health assessment for new outpatients are conducted to decide initial treatment plan and a clinic in charge for the patients. The patients who need comprehensive dental care and who cannot cooperate students’ practice also attend this clinic to receive general dental practice.

(6) Clinical Performances

In the Dental Hospital, the clinic of Oral Diagnosis and General Dentistry is the first clinic for new outpatients. That is, the clinic is responsible for constructing good relationship between patients and the hospital. Therefore, the doctors pay attention actively to psychosocial aspects of patients during examination. In diagnosing and deciding clinic for patients, initial-treatment plans are introduced to patients. In this process, doctors think treatment plans together with patients thoroughly to obtain sound informed consent. Many patients who visits the dental hospital demands high medical level of the university hospital while not a few patients needs primary care. Oral Diagnosis and General Dentistry provides such patients with general dental practice to meet various kinds of patients’ needs, makes effort to improve patients’ satisfaction.

(7) Publications

[Original Articles]


4. Maiko Iwaki, DDS, PhD. A case report of oral rehabilitation using an over denture with magnetic attachments Annals of Japan Prosthodontic Society. 2017.07; 9(7); 255-258


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8. Ken-ichi Tonami, Sachie Umemori, Hiroshi Nitta, Kouji Araki, Shiro Mataki. Changes in Student Evaluations of a Medical Ethics Class 3 Years Later European Journal of General Dentistry. 2017.09; 6(3); 123-126

9. Yasuyuki Kimura, Ken-ichi Tonami, Shiro Mataki, Kouji Araki. Analysis of new outpatients’ responses to a survey of their reasons for visiting a dental clinic European Journal of General Dentistry. 2017.10; 6(3); 111-114


12. Kanako NORITAKE, Jun TSURUTA, Ken-ichi TONAMI, Sachie Umemori, Shigeru ODA, Shiro MATAKI, and Kouji ARAKI. Development of Undergraduate Dental Student Interview and Diagnostic Skills during Clinical Practice of Medical Interviews The Journal of the Stomatological Society, Japan.. 2017.11; 84(3); 103-110

13. Koki Hobo, Kanako Noritake, Masayo Sunaga, Tomoe Miyoshi, Riden Cao, Hiroshi Nitta, Yuji Kabasawa and Atsushi Kinoshita. Effects of an interactive simulation material for clinical dentistry on knowledge acquisition and memory retention in dental residents Journal of Medical and Dental Sciences. 2017.12; 64(4); 43-52


[Books etc]


[Misc]

1. HIDESHIMA M. Author’s Answers of Questions from Readers (DE No.196) 'Oral Appliances for Sleep Apnea Syndrome' The Journal of the Japanese Society for Dental Materials and Devices, The Journal of Dental Engineering. 2017.09; 36(4); 260

[Conference Activities & Talks]

1. UMEMORI Sachie, Aida J, Tonami K, Tabuchi T, Araki K, Matakasi S, Kondo K. Tthe association between secondhand smoking and number of remaining teeth among older Japanese. The 27th Annual Scientific Meeting of the Japan Epidemiological Association 2017.01.27 Koufu

2. Ken-ichi Tonami, Shizuko Ichinose, Kazunobu Sano, Naohiko Iwasaki, Hidekazu Takahashi, Shiro Mataki, Kouji Araki. Analysis of the dentin surface after Xe excimer lamp irradiation. The 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco


5. The clinical and educational effects of the newly-introduced interprofessional clinical practice. 2017.05.13
6. Hiroyuki Suzuki, Manabu Kanazawa, Noriko Amagai, Yuriko Komagamine, Maiko Iwaki, Ayami Jo, Shunsuke Minakuchi. Effect of simple dietary advice combined with denture fabrication by dentist on nutrient intake of edentulous elderly. The 71th Annual Meeting of Japan Society of Nutrition and Food Science 2017.05.20 Okinawa

7. Maekawa S, Matsuura T, Hoshi S, Mizutani K, Izumi Y. Patient-Reported Outcomes and Clinical Evaluation of Combination Therapy of GTR with Autograft or Xenograft: Interim report of a Randomized Controlled Trial. National Symposium OSTEOLGY JAPAN 2017.06.03 Tokyo

8. Iwaki Maiko, Kanazawa manabu, Miyayasu Anna, Sato Daisuke, Kasugai Shohei, Minakuchi Shunsuke. Prospective study of immediate Loaded two-implants mandibular overdentures: 5-years follow up. 2017.06.30 Yokohama


11. UMENOMI Sachi, Tonami K, Noritake K, Mataki S, Araki K. The usefulness of the small test to assess the level of knowledge of dental students during clinical training. The 36th General Scientific Meeting of the Japanese Dental Education Association 2017.07.28

12. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Mataki. Factor analysis of students’ perception of inter-personal relations during "Introduction to the behavioral science" class. 31th IADR-SEA 28th SEAADE 2017.08.10 Taipei

13. SH Le, K Tonami, S Umemori, LT Nguyen, LT Ngo, S Mataki. Effect of preoperative anxiety on healing recovery after oral surgery. 31th IADR-SEA 28th SEAADE 2017.08.10 Taipei

14. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Mataki. Effects of the Great East Japan Earthquake on students’ perception of inter-personal relations. ADEE Annual Conference 2017.08.23 Vilnius, Lithuania


21. Shota Hayashi, Masayuki Hideshima, Naoki Ishihara, Tomohiro Kurashima, Shusuke Inukai, Yuuko Mitsuma, Shuhei Nakamura, Toshihide Fujie, Yasunari Miyazaki, Meiyo Tamaoka. Conversion from continuous positive airway pressure therapy to oral appliance therapy for obstructive sleep apnea in Tokyo Medical and Dental University Hospitals. 16th the Japanese Academy of Dental Sleep Medicine 2017.11.04 Yamaguchi, Japan.


[Awards & Honors]

1. Eugene Seidner Student Scholarship 2nd prize (Shigeru Oda), The 24th Academy of Laser Dentistry Annual Conference, Arizona, USA, April 6-8, 2017, 2017.04

2. Student Scholarship Second Prize (Masaki Tsubokawa), Academy of Laser Dentistry, 2017.04

3. Best Clinical Research Award, National Symposium OSTEOLOGY JAPAN (Maekawa S), National Symposium OSTEOLOGY JAPAN, 2017.06

4. Advanced Education System Development (Kanako Noritake), Japanese Dental Education Association, 2017.07

Comprehensive Patient Care
Psychosomatic Dentistry

Professor Akira Toyofuku
Assistant Professor Miho Takenoshita
Hospital Staff Anna Suzuki-Miura, Kaoru Kawasaki, Takeshi Watanabe
Graduate Student Yukiko Shinohara, Anna Suzuki-Miura, Rou Mikuzuki Kaoru Kawasaki, Shiori Sugawara, TU Thi Huyen Trang Takayuki Suga, Kazuya Watanabe
Lecturer (part-time) Haruhiko Motomura, Ayano Katagiri, Tatsuya Yoshikawa

(1) Outline
Psychosomatic dentistry is the only one department in Japan, which research and develop new diagnosis and treatment methods for MUOS such as BMS, AO, PBS etc.

(2) Research
1) Study on pathophysiological mechanisms of oral psychosomatic disorders
2) Psychosomatic study on oro-facial medically and psychiatrically unexplained symptoms
3) Brain imaging of oral psychosomatic disorders
4) Psychopharmacological study on oral psychosomatic disorders

(3) Education
It is not uncommon to see the patients diagnosed with “Oral Psychosomatic Disorders”, so there is a growing need for proper treatment of the disorders from both sides of doctors and patients. It is, therefore, extremely important for dental students to instruct in psychosomatic dentistry. However, few Dental Universities in Japan are following this. At the same time, there’s a great deal of misunderstanding about psychosomatic dentistry, in spite of we have many years of consistent education. For example, “Your work is only hearing to complaints from patients”, “Patients with not otherwise specified mental illness is eventually referred to your clinic”, or “The mission of your clinic is to calm down your patients with unidentified dental and oral complaints”.

So, regarding undergraduate medical education, we focus on not only lessons from lectures and books but also practical experience through clinical training. We have comprehensive medical teaching for fifth and sixth-year students. Students can listen to patient’s complaints directly and deepen their understanding. Actually they can see patients with dental psychosomatic disorders, and they know that these disorders are treatable. Moreover, they can learn negative effects of wrong ideas as a psychogenic disorder, and they can understand serious distress in patients and family members.

This practice is arduous effort, but in the future, it is hoped that efforts will be made to facilitate uniformed services for patients with dental psychosomatic disorders, enhance coping skills for refractory cases, and reduce
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trouble with patients by the graduates of our department who mastered psychosomatic dentistry. It is important to have identity as a dentist on practice of psychosomatic dentistry. Therefore we have advanced strengthening of human resource development. In particular, we focus on cultivation of dentists who can be readily applied their knowledge of psychosomatic medicine to clinical practice. And we are working towards establishment of ‘psychosomatic dentistry’ introduced psychotherapy. Also regarding education for graduate student, we focus on clinical practice for development of dentists who have great skill in psychosomatic dentistry.

(4) Clinical Services & Other Works

We take charge of “Psychosomatic Dentistry clinic” in dental hospital of Tokyo Medical and Dental University. This special clinic is for patients with oral psychosomatic disorders, such as glossodynia (burning mouth syndrome), atypical facial pain, atypical odontalgia, oral dysesthesia, occlusal discomfort (dysesthesia). Main psychosomatic treatment is psychopharmacological one with SSRIs (Selective Serotonin Reuptake Inhibitors), SNRI (Serotonin-Noradrenaline Reuptake Inhibitor), SDAs (Serotonin-Dopamin antagonists) etc. And supportive psychotherapies are applied.

Intractable cases are increasing year by year, we take care of every patient and have good clinical courses about 70% of them. We believe there are exactly “oral psychosomatic disorders”, and dentists should be in charge of treatment. Psychosis, as a matter of course, should be taken care by psychiatrists, so we discriminate them from oral psychosomatic disorders, and properly refer to psychiatry. On the other hand, on “functional somatic symptoms secondary to psychiatry disorders”, which are refer to us from psychiatrists, we do our best in cooperation with psychiatrists.

We have about 600 new outpatients per year, and almost of them were referred from other specialists not only in dentistry but also internal medicine, otorhinolaryngology, dermatology, psychosomatic medicine, and psychiatry. They come from the Metropolitan area, of course, Osaka, Kyushu, Hokkaido and so on. We take fine-grained care and follow up, total number of patients is up to 10,000 per year.

We have a mission to meet the demand of these patients and their families, so better treatment outcome and increasing efficiency are required, and cooperation with other medical specialists is needed.

(5) Clinical Performances

Psychosomatic dentistry clinic is very unique, specialized for patients with MUOS. We have treated a large number of patients with various oral psychosomatic problems. With our unrivalled clinical experiences for MUOS, we offer our best clinical setting for the treatments of every MUOS.

(6) Publications

[Original Articles]


2. Miho Takenoshita, Anna Miura, Yukiko Shinohara, Rou Mikuzuki, Shiori Sugawara, Trang Thi Huyen Tu, Kaoru Kawasaki, Takeru Kyuragi, Yojiro Umezaki and Akira Toyofuku. Clinical features of atypical odontalgia; three cases and literature reviews BioPsychoSocial Med. 2017.08; 11; 21


[Misc]

[Conference Activities & Talks]
1. Takayuki Suga, Takeshi Watanabe, Tu Trang T.H, Kaoru Kawasaki, Shiori Sugawara, Lou Mikuzuki, Yukiko Shinohara, Anna Miura, Miho Takenoshita, Akira Toyofuku. A high discrepancy of neurovascular compression on symptomatic and asymptomatic side in atypical odontalgia patients. 24th Wolrd congress on psychosomatic medicine 2017.09.14 China National Convention Center, Beijing, China
3. Yukiko Shinohara, K Kawasaki, Trang Tu Thi Hyen, T Watanabe, A Toyofuku . Regional cerebral blood flow pattern in "Phantom bite syndrome" is different from that of "Delusional disorder somatic type". 24th Wolrd congress on psychosomatic medicine 2017.09.14 China National Convention Center, Beijing, China
4. THI HUYEN TRANG TU, Kawasaki K, Sugawara S, Watanabe T, Suga T, Mikuzuki L, Shinohara Y, Miura A, Takenoshita M, Toyofuku A. Atypical odontalgia with comorbid burning mouth syndrome: a 4-year retrospective study. 24th Wolrd congress on psychosomatic medicine 2017.09.15 China National Convention Center, Beijing, China
5. Kaoru Kawasaki, Trang Tu Thi Huyen, Shiori Sugawara, Akira Toyofuku. Is salivary volume reduction related to drug reactivity of burning mouth syndrome?. 24th Wolrd congress on psychosomatic medicine 2017.09.15 China National Convention Center, Beijing, China
7. Anna Miura, Yukiko Shinohara, Lou Mikuzuki, Kaoru Kawasaki, Shiori Sugawara, Tu Thi Huyen Trang, Takayuki Suga, Takeshi Watanabe, Miho Takenoshita, Akira Toyofuku . Psychiatric Comorbidities in Atypical Odontalgia.. 24th Wolrd congress on psychosomatic medicine 2017.09.15 China National Convention Center, Beijing, China
Behavioral Dentistry

Professor Shiro Mataki
Associate Professor Hiroshi Nitta
Research Associate Sachi Umemori
Graduate Student Ayako Kubota
Graduate Student Le Son Hoang (Vietnam)

(1) Research
1) Construction of educational system of behavioral dentistry for dental students
2) Application of behavioral science to development of dental educational curriculum
3) Patients’ evaluation of the dental hospital and the dental educational system
4) Application of behavioral science to dental clinic

(2) Lectures & Courses
Topic of Behavioral Dentistry included characteristics of human behavior, especially of relationship between patients and dental staff based on the informed consent. Main objective of behavioral dentistry in the graduate course is to provide students opportunity to study application of behavioral science to deal with dental patients showing various perception and behavior in clinic.

(3) Clinical Services & Other Works
Behavioral Dentistry provides medical interview for preliminary diagnosis and general dental practice at the clinic of oral diagnosis and general dentist cooperating with General Dentistry.

(4) Publications
[Original Articles]
1. Ken-ichi Tonami, Sachi Umemori, Hiroshi Nitta, Kouji Araki, Shiro Mataki. Changes in Student Evaluations of a Medical Ethics Class 3 Years Later European Journal of General Dentistry. 2017.09; 6(3); 123-126
3. Yasuyuki Kimura, Ken-ichi Tonami, Shiro Mataki, Kouji Araki. Analysis of new outpatients’ responses to a survey of their reasons for visiting a dental clinic European Journal of General Dentistry. 2017.10; 6(3); 111-114

6. Kanako NORITAKE, Jun TSURUTA, Ken-ichi TONAMI, Sachi Umemori, Shigeru ODA, Shiro MATAKI, and Kouji ARAKI. Development of Undergraduate Dental Student Interview and Diagnostic Skills during Clinical Practice of Medical Interviews. The Journal of the Stomatological Society, Japan. 2017.11; 84(3); 103-110

[Conference Activities & Talks]

1. UMEMORI Sachi, Aida J, Tonami K, Tabuchi T, Araki K, Matakị S, Kondo K. The association between secondhand smoking and number of remaining teeth among older Japanese. The 27th Annual Scientific Meeting of the Japan Epidemiological Association 2017.01.27 Koufu

2. UMEMORI Sachi, Tonami K, Noritake K, Matakị S, Araki K, . The usefulness of the small test to assess the level of knowledge of dental students during clinical training. The 36th General Scientific Meeting of the Japanese Dental Education Association 2017.07.28

3. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Matakị. Factor analysis of students’ perception of inter-personal relations during "Introduction to the behavioral science" class. 31th IADR-SEA 28th SEAADE 2017.08.10 Taipei

4. SH Le, K Tonami, , S Umemori, LT Nguyen, LT Ngo, S Matakị. Effect of preoperative anxiety on healing recovery after oral surgery. 31th IADR-SEA 28th SEAADE 2017.08.10 Taipei

5. Ken-ichi Tonami, Sachi Umemori, Son Hoang Le, Kouji Araki, Hiroshi Nitta, Shiro Matakị . Effects of the Great East Japan Earthquake on students’ perception of inter-personal relations. ADEE Annual Conference 2017.08.23 Vilnius, Lithuania


Professional Development in Health Sciences

Professor Kazuki Takada
Associate Professor Jun Tsuruta
Associate Professor Mina Nakagawa
Junior Associate Professor Kumiko Yamaguchi

(1) Outline

Worldwide, accelerated aging and the shift in disease burdens have created a demand for innovations in health sciences, healthcare, and the healthcare delivery system. Innovation requires not only a vast amount of knowledge and superior skills, but also critical and creative thinking skills. Innovation concerning new drugs and medical devices further requires understanding of the entire flow and process of research and development. In our department, we provide educational opportunities for learners to acquire high-level and practical knowledge of the followings: history of medical and dental education in Japan, professional education/development/certification in Japan and North American/European countries, key pedagogical theories and learning methods, process-based approach and logic models in curriculum development, and competencies and their assessment/evaluation.

(2) Research

- Needs assessment in health care and in professional development in health science fields
- Curriculum development for professionals of the future needs in health sciences
- Interprofessional education curriculum development

(3) Clinical Services & Other Works

Medical Hospital
Kazuki TAKADA : Rheumatology
Mina NAKAGAWA : Gastroenterology and Hepatology

Dental Hospital
Jun TSURUTA : Oral Diagnosis and General Dentistry

(4) Publications

[Original Articles]

1. Keiko Okumura, Kumiko Yamaguchi, Tatsuya Tamaki, Kazuhiro Oinuma, Hikaru Tomoe, Keiichi Akita. Prospective analyses of female urinary incontinence symptoms following total hip arthroplasty. Int Urogynecol J. 2017.04; 28(4); 561-568

2. Kentaro Matsuura, Hiromi Sawai, Kazuho Ikeo, Shintaro Ogawa, Etsuko Iio, Masanori Isogawa, Noritomo Shimada, Atsumasa Komori, Hidenori Toyoda, Takashi Kumada, Tadashii Namisaki, Hitoshi Yoshiji, Naoya Sakamoto, Mina Nakagawa, Yasuhiro Asahina, Masayuki Kurosaki, Namiki Izumi, Nobuyuki Enomoto, Atsunori Kusakabe, Eiji Kajiwara, Yoshito Itoh, Tatsuya Ide, Akihiro Tamori, Misako Matsubara, Norifumi Kawada, Ken Shirabe, Eiichi Tomita, Masao Honda, Shuichi Kaneko, Sohji Nishina, Atsushi...


8. Hiroko Nagata, Mina Nakagawa, Yasuhiro Asahina. Reply to: "Imaging Basis of AFP and WFA+M2BP as Indicators of the risk of HCC after SVR". J. Hepatol. 2017.10; 66; 69A


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Itsui, Seishin Azuma, Sei Kakinuma, Toshihiko Nouchi, Hideki Sakai, Makoto Tomita, Mamoru Watanabe. Effect of interferon-based and -free therapy on early occurrence and recurrence of hepatocellular carcinoma in chronic hepatitis C. J. Hepatol. 2017; 67(5); 933-939


[Conference Activities & Talks]

1. Jun Tsuruta, Kumiko Yamaguchi, Ayako Ichikawa, Yoko Yoshihashi, Mina Nakagawa, Kazuki Takada. Behavior changes of dental students after final-year IP program. ADEA/ADEE Joint meeting, London 2017.05.08


3. Mina Nakagawa, Kumiko Yamaguchi, Janelle Moross, Ayako Ichikawa, Yoko Yoshihashi, Chiharu Kawakami, Jun Tsuruta, Kazuki Takada, Yujiro Tanaka and Junji Tagami. Introduction of interprofessional education (IPE) for medical and dental students. AMEE 2017 2017.08.29 Helsinki

4. Kumiko Yamaguchi, Mina Nakagawa, Chiharu Kawakami, Yoko Yoshihashi, Ayako Ichikawa, Kazuki Takada. Improvement of the patient-centered medicine portion of IPE program by adding patients’ lectures. ANNUAL CONFERENCE 2017, AN INTERNATIONAL ASSOCIATION FOR MEDICAL EDUCATION 2017.08.30

5. Mina Nakagawa, Kumiko Yamaguchi, Janelle Moross, Kazuki Takada, Yujiro Tanaka, Junji Tagami. Introduction of interprofessional education (IPE) for medical and dental students. ANNUAL CONFERENCE 2017, AN INTERNATIONAL ASSOCIATION FOR MEDICAL EDUCATION 2017.08.30


Neuroanatomy and Cellular Neurobiology

Professor: TERADA Sumio
Assistant Professor: KAWAGISHI Masahiko
Assistant Professor: SAI TO Kenta
Assistant Professor: SATO Keisuke
Lab Manager, Administrative Assistant: TAGUCHI Mie

(1) Research

Our lab has focused in two major directions:

(1) How are cytoplasmic proteins transported in cells, and what other intracellular elements are necessary for their quality control during transport? How are the dynamics of cytoskeletal proteins in neurons regulated and coordinated?

Neuronal cells such as neurons and glial cells are atypical and asymmetric in their morphology; both of them having long processes. They have to endure the burden of energy-consuming long-distance intracellular transport, and develop specialized cytoskeletal structures. Both intracellular transport and cytoskeletal dynamics are inseparably interrelated, and essential for the cellular homeostasis and function. One of the main interests of our laboratory is to understand how their dynamics are regulated and how these dynamics define neuronal morphologies and functions.

(2) How do inhalation anesthetics exert their effects on synaptic transmissions?

Our interests are in deciphering the long-lasting mystery of inhalation anesthetic effects on synaptic transmissions, major mechanism in mammals that insures secure and painless surgical operations. We use electrophysiological preparations as well as newly developed spectroscopic techniques to identify their principles.

(2) Education

Department of neuroanatomy and cellular neurobiology takes charge of basic neuroscience education for medical undergraduate student (Lectures and Wet labs), especially from the morphological point of view. For graduate school students, our group offers introductory courses on both optical and electron microscopy (Lectures and Wet labs), with close relation to molecular and cellular neurobiology.

(3) Publications

[Conference Activities & Talks]

1. Masahiko KAWAGISHI, Yuki OBARA, Takayuki SUZUKI, Masumi HAYASHI, Kazuhiko MISAWA, Sumio TERADA. Direct label-free measurement of the distribution of small molecular weight compound using coherent Raman microspectroscopy. The 122nd Annual Meeting of the Japanese Association of Anatomists 2017.03.29 Nagasaki, Nasaki, JAPAN
Systems Neurophysiology

Professor Izumi Sugihara
Associate Professor Yuriko Sugiuchi
Lecturer Yoshiko Izawa
Assistant Professor Mayu Takahashi
JSPS Postdoctoral Research Fellow Hermina Nedelescu
Students (dorcor) 6
Part-time lecturer Hirofumi Fujita

(1) Outline

Department of Systems Neurophysiology, formerly Department of Physiology #1 of the medical school, is one of the basic medicine departments and take charge of research and education in the field of neurophysiology and related neurosciences.

(2) Research

Our main interest lies in clarifying the structures that underlies function of the central nervous system and then understanding their function. We are focused on the part of the central nervous system that is involved in control of eye movements. The eye movement control system is located in the cerebrum, brainstem and cerebellum, has been studied in great detail and is important clinically. The cerebellum itself is another site of focus. Dysfunction of the cerebellum causes ataxia, a movement disorder associated with impaired control of movement. We use electrophysiological, morphological and cell-biological approaches.

1) Cerebellar function

Distinct regions in the cerebellum make specific connections with different areas of the brain and are involved in the control of various movements including eye movements. For example, the neuronal circuitry that connects the lateral cerebrum, pontine nuclei, cerebellar cortex (hemisphere), cerebellar nucleus (dentate nucl.), thalamus and cerebrum is important for initiation, execution and control of movements. To understand cerebellar function, it is important to understand the organization of the cerebellum into distinct anatomical regions, to characterize the specific neuronal circuitry of these regions, and to identify how the cerebellum is organized into regions and functions by way of the input and output systems. Our systematic approach to this question includes (developmental) anatomy, molecular biology, and electrophysiology. We have expertise in neuronal labeling with marker molecules and tracers, single-axonal reconstruction, three-dimensional mapping of neuronal projection patterns.

(3) Education

We participate in Introductory Neurophysiology, Neuroscience and Physiology Lab courses for medical students (2nd year) as well as in courses for graduate students. We mainly teach the neurophysiology sections in these courses. Our goal is for students to understand normal function of nerve cells and the nervous system and,
on this ground, to understand pathological states of the nervous system in disease. For this purpose, we give clinically-oriented lectures and laboratory courses linked with morphology and pharmacology.

(4) Lectures & Courses

Our lectures cover transport and electric potential of the cell membrane, excitation and synaptic transmission (Introductory Neurophysiology), sensory systems, motor systems, autonomic nervous systems, and higher brain function (Neuroscience), i.e. neurophysiology in general from the molecular, cellular through the organismic levels. To promote students’ self-learning attitude, we sometimes employ an "active-learning" style. In the laboratory course, we promote student-teacher discussion in small groups. We have had three 'elective research course’ students.

(5) Publications

[Original Articles]


2. Vibulyaseck S, Fujita H, Luo Y, Tran AK, Oh-Nishi A, Ono Y, Hirano S, Sugihara I. Spatial rearrangement of Purkinje cell subsets forms the transverse and longitudinal compartmentalization in the mouse embryonic cerebellum. Journal of Comparative Neurology. 2017.05; 525(14); 2971-2990


[Misc]


[Conference Activities & Talks]

1. Vibulyaseck S, Fujita H, Luo Y, Ono Y, Hirano S, Sugihara I.. Differentiation and migration of Purkinje cell subsets in the cerebellar primordium. 9th CBIR/ONSA Symposium for Inspiring Young Scientists 2017.02.11 Tokyo

2. Izumi Sugihara. The ansiform lobule (crus I in the rodent cerebellum) is unique in its conformation, axonal connection, striped pattern, evolution and development in the mammalian cerebellum. The 8th International Symposium of the Society for Research on the Cerebellum and Ataxias (SRCA): from Development to Disease 2017.05.25 Winnipeg, Manitoba, Canada

3. Mayu Takahashi. Functional roles of commissural connections between the superior colliculi. Seminars on neural basis of motor control (Satellite symposium in honor of David Robinson) 2017.05.25


Pharmacology and Neurobiology

(1) Outline

Many intriguing mysteries left in the issue of brain function like (1) learning and memory, (2) cognition and behavior, (3) generation of consciousness, (4) personality and mentality. On the other hand, in the modern-day world with a complicated human relations and prolonged life span, necessity of deeper understanding and development of the means to cure the numerous neurological disorders and pain is enormously increased.

(2) Research

1. Regulation of Microglial function in Neuroinflammation/Neurodegenerative diseases
2. Regulation of Macrophage function in Inflammatory bowel disease and Rheumatoid arthritis
3. Energy metabolic imaging at single cell level of cancer stem cell/cancer cell using Biohminescence and FRET and Imaging
4. Energy metabolic imaging at single cell level of neuron, microglia and astrocyte in the degenerative area of the mouse model of various neurodegenerative diseases
5. Neural mechanisms of pleasure and motivation in feeding
6. Molecular basis of Calcium channelopathy
7. Alteration of Neuron-Glia interaction in Neurological disorders

(3) Education

Undergraduate course: Pharmacology course provides the principle of pharmacological basis of therapeutics. Several representative therapeutic drugs in each disease will be picked up and systematic lectures -from basic pharmacology to mechanism of action, drug metabolism, clinical application and side effects- will be provided. Students are projected to acquire self-learning skills during the course and expected to be ready for handling clinical cases by pharmacological means.

We consider education through the pharmacology lab work is important. Students are given opportunity to dissect out several tissues (heart, skeletal muscle, ileum and vas deferens) from living animals by themselves and test the effect of a number of drugs including specific agonist, antagonist and non-selective drugs. Lab work course is divided into two parts. In the first part, students were given several known drugs for testing the known effect on these tissues. In the second part, students are given two unknown drugs and requested to identify the name and concentration of each drug using the tissues they prepare by themselves.

Graduate course: During the first couple of months, students are requested to acquire basic techniques of biochemistry, molecular biology, pharmacology and electrophysiology that are routinely used in our laboratory. Then students will be given a small project to do using the techniques they have learned during the initial
training. Students are also required to read relevant scientific papers and conduct seminar style lectures to other lab members monthly. After completion of the initial phase, students start their own project under the supervision of the faculties in the lab.

(4) Publications

[Conference Activities & Talks]

1. Daisuke H. Tanaka, Shusheng Li, Tsutomu Tanabe. Expression of gustatory 'disgust' reactions recruit specific amygdaloid nuclei in mice. The 40th Annual Meeting of the Japan Neuroscience Society 2017.07.21 Chiba, Japan
Molecular Neuroscience

Professor Kohichi Tanaka
Associate Professor Tomomi Aida
Assistant Professor Saeko Ishida
Assistant Professor Yuichi Hiraoka (2015/5/1)

Graduate Student (doctor course)
Zhao Zhuoyang
Kaori Sugiyama
Takehisa Handa

Graduate Student (master course)
Mina Kusunose
Moeko Tanaka
Haruka Takigawa
Hiroshi Ogawa

Technical Staff
Harumi Ishikubo
Secretary
Satomi Ohno

(1) Outline
The final goal of our research is to understand molecular, cellular, and neuronal ensemble mechanisms underlying higher order brain functions including learning and memory. For that purpose, we combine molecular genetics, physiological and behavioral methods. The laboratory also studies the mechanism that underlies neuronal cell death and regeneration.

(2) Research
1. Functions of glutamate transporters in the brain
Glutamate is a major excitatory neurotransmitter and plays an important role in neuronal plasticity and neurotoxicity in the central nervous system. Glutamate transport proteins provide the mechanism by which synthetically released glutamate is inactivated and kept below toxic levels in the extracellular space. By now, five subtypes of high-affinity glutamate transporters have been identified in the mammalian brain. Our lab studies the physiological and pathological roles of glutamate transporter subtypes using subtype-specific knockout mice. Clinical phenotypes of spinocerebellar ataxia type-5 (SCA5) and spectrin-associated autosomal recessive cerebellar ataxia type-1 (SPARCA1) are mirrored in mice lacking β-III spectrin (β-III-/-). One function of β-III spectrin is the stabilization of the Purkinje cell-specific glutamate transporter EAAT4 at the plasma membrane. In β-III-/- mice EAAT4 levels are reduced from an early age. In contrast levels of the glutamate transporter GLAST, expressed in Bergmann glia, only fall progressively from 3 months onwards. Here we elucidated the roles of these two glutamate transporters in cerebellar pathogenesis mediated through loss of β-III spectrin function by studying EAAT4 and GLAST knockout mice as well as crosses of both with β-III-/- mice. Our
data demonstrate that EAAT4 loss, but not abnormal AMPA receptor composition, in young β-III-/- mice underlies early Purkinje cell hyper-excitability and that subsequent loss of GLAST, superimposed on the earlier deficiency of EAAT4, is responsible for Purkinje cell loss and progression of motor deficits. Yet the loss of GLAST appears to be independent of EAAT4 loss, highlighting that other aspects of Purkinje cell dysfunction underpin the pathogenic loss of GLAST. Finally, our results demonstrate that Purkinje cells in the posterior cerebellum of β-III-/- mice are most susceptible to the combined loss of EAAT4 and GLAST, with degeneration of proximal dendrites, the site of climbing fibre innervation, most pronounced. This highlights the necessity for efficient glutamate clearance from these regions and identifies dysregulation of glutamatergic neurotransmission particularly within the posterior cerebellum as a key mechanism in SCA5 and SPARCA1 pathogenesis.

We investigated the cytoprotective effect of geranylgeranylnaceteone (GGA) on RGCs degeneration using a normal tension glaucoma (NTG) mouse model, which lacks GLAST. Three-week-old GLAST+/- mice were given oral administration of GGA at 100, 300, or 600 mg/kg/day or vehicle alone, and littermate control mice were given vehicle alone for 14 days, respectively. The number of RGCs of GLAST+/- mice significantly decreased, as compared to that of control mice. RGC loss was significantly suppressed by administration of GGA at 600 mg/kg/day, compared with vehicle alone. Following GGA administration, HSP70 was significantly upregulated together with reduction in the activities of caspase-9 and -3. Our studies highlight HSP70 induction in the retina is available to suppress RGC degeneration, and thus GGA may be applicable for NTG as a promising therapy.

2. Development of genome editing technologies
Although CRISPR/Cas enables one-step gene cassette knock-in, assembling targeting vectors containing long homology arms is a laborious process for high-throughput knock-in. We recently developed the CRISPR/Cas-based precise integration into the target chromosome (PITCh) system for a gene cassette knock-in without long homology arms mediated by microhomology-mediated end-joining.

Here, we identified exonuclease 1 (Exo1) as an enhancer for PITCh in human cells. By combining the Exo1 and PITCh-directed donor vectors, we achieved convenient one-step knock-in of gene cassettes and floxed allele both in human cells and mouse zygotes. Our results provide a technical platform for high-throughput knock-in.

(3) Education

Goals/Outline:
Students should generate genetically modified animals to comprehensively understand the cognitive mechanisms at the level of molecule to behavior. Then, students should analyze cognitive deficits of mutant animals and those molecular mechanisms.

Available programs:
Participation in the ongoing research project; as needed
Training for cell biology: five times a year 13:00 – 16:00

Experiment:
2. Generation of genetically modified mice
3. Behavioral analysis of the mice
4. Morphological analysis of central nervous systems.

(4) Lectures & Courses

The aim of this practice is to learn molecular biological, anatomical, electrophysiological and psychological approaches to elucidate the mechanism of cognition. Moreover, based on previous case reports of cognitive deficits, students should plan and discuss what kinds of the researches are possible and meaningful to elucidate the pathology of these diseases, leading to unveil the mechanism of cognition.
(5) **Publications**

**[Original Articles]**


2. Ken-Ichiro Kubo, Kimiko Deguchi, Taku Nagai, Yukiko Ito, Keitaro Yoshida, Toshihiro Endo, Seico Benner, Wei Shan, Ayako Kitazawa, Michihiko Aramaki, Kazuhiro Ishii, Minkyung Shin, Yuki Matsumaga, Kanehiro Hayashi, Masaki Kakeyama, Chiharu Tohyama, Kenji F Tanaka, Kohichi Tanaka, Sachio Takashima, Masahiro Nakayama, Masayuki Itoh, Yukio Hirata, Barbara Antalffy, Dawna D Armstrong, Kiyofumi Yamada, Ken Inoue, Kazunori Nakajima. Association of impaired neuronal migration with cognitive deficits in extremely preterm infants. *JCI Insight.* 2017.05; 2(10);


**[Misc]**

1. Saeko ISHIDA. DEPDC5, causative gene of focal epilepsy__Understanding the pathogenesis using Depdc5 KO rats 2017.12; (39); 43

**[Conference Activities & Talks]**

1. Uchida Mizuki, Hida Hirotake, Mori Kentaro, Kitagaki Shinji, Ozaki Norio, Tanaka Kohichi, Yoshimi Akira, Noda Yukihiro. Functional roles of glial glutamate transporter in psychobehavioral abnormalities of mice administered phencyclidine repeatedly. *Journal of Pharmacological Sciences* 2017.03.01

Neuropathology

Professor: Hitoshi Okazawa
Practical professor: Kazuhiro Tagawa
Project Lecturer/Part-time Lecturer: Haruhisa Inoue, Masaki Sone, Toshiki Uchihara
Assistant professor: Kyota Fujita
Project Assistant professor: Xigui Chen, Hidenori Homma, Emiko Yamanishi
Graduate Student: Kanoh Kondo, Hikari Tanaka, Maiko Inotsume, Yuki Yoshioka

(1) Outline

The goals of our research are to elucidate molecular mechanisms of neurodegenerative disorders as well as of mental retardation, and to develop novel therapeutics for those intractable diseases. In neurodegeneration, we are now focusing on polyglutamine diseases including hereditary spinocerebellar degenerations and Huntington’s disease. Knowledge from transcriptome and proteome analyses of the pathologies will lead to new types of molecular therapeutics. In reference to mental retardation, we are developing animal models and analyzing molecular pathologies of our original molecule PQBP1 whose mutations cause mental retardation with microcephaly. This line of research is also for developing new therapeutics of the common but intractable diseases.

(2) Research

Research Contents

Following studies have been intensively carried out in our laboratory.
1) Investigation of molecular pathologies of neurodegenerative diseases.
2) Studies on impairment of DNA-repair in polyglutamine diseases.
3) Development of new seed drugs for neurodegeneration.
4) Development of new seed drug for mental retardation.
5) Investigation of molecular functions of Oct-3/4

Below is the brief report of this year’s progress.
Spinocerebellar ataxia type 1 (SCA1) is one of the major models of neurodegenerative disease. At the same as other neurodegenerative diseases such as Alzheimer’s disease (AD), Parkinson’s disease (PD) and amyotrophic lateral sclerosis (ALS), disease modifying therapy for SCA1 has not developed. Although a lot of knowledge for pathology caused by mutation has also been accumulated, it has not been clear neither when it occurs, what it is, nor how to treat it. For instance, in context of therapeutic strategies of AD, there were many clinical investigations to remove amyloid-beta, however, clinical symptoms did not improve or stop the progression despite elimination of amyloid-beta. This fact tells us that it is quite important to uncover that when irreversible pathology of neurodegenerative diseases occurs and what the pathology is.
In our previous study, we studied about the effect of stage-specific expression of YAPdeltaC to symptoms of SCA1 model mice (Ataxin-1 knock-in mice) and their survival time using our newly developed Tet-ON YAPdeltaC system in Atxn1-KI mice. As a result, expression of YAPdeltaC from embryo stage to 8 weeks after...
birth made significant improvement of symptoms and survival duration, however, almost no effect found with expression of YAPdeltaC after 8 weeks. Moreover, we revealed that YAPdeltaC works collaboratively with normal Ataxin1 as transcriptional coactivator enhancing RORalpha, that plays a role of regulation of gene expression in cerebellar neurons at developmental stage. Because mutant Ataxin1 deprives YAPdeltaC from RORalpha, it inhibits expressions of genes necessary for maturation of cerebellar neurons. We also found that forcible expression of YAPdeltaC increases its binding of RORalpha and that makes a recovery of gene expressions required to mature cerebellar neurons.

Clinical studies to examine candidate drugs by starting the clinical trial before onset are now undergoing in USA, and are also planned in Japan. Our study showed that recovery of gene expressions required for maturation of cerebellar neurons in developmental stage improves clinical symptoms of SCA1 model mice in adulthood. Because genetic diagnosis can be available for SCA1 patients, it could be possible to develop prophylactic or disease modifying therapy in the future by increasing amount of YAPdeltaC at preclinical stage. This study presented a great example that preclinical therapy was needed for neurodegenerative diseases commonly, not only for AD. At the same time, it has great significance that revealed its therapeutic target molecule.


Frontotemporal lobar degeneration (FTLD) is one of the most common causes of early-onset dementia, and can lead to personality changes, impaired speaking, and motor dysfunction. While most cases occur sporadically, several inherited forms of FTLD have been linked to genetic mutations, which can offer clues to the cause of the disease and potential approaches to treatment. In a study published in Nature Communications, researchers have now uncovered several key events that occur in a common form of familial FTLD linked to mutations in the PGRN gene.

FTLD is a neurodegenerative disease caused in part by the build-up of protein aggregates in neurons. Different forms of FTLD—including the two major hereditary forms of the disease, FTLD-tau and FTLD-TDP—are associated with the build-up of different proteins. The hallmark of FTLD-tau is accumulated tau protein, a well-known player in neurological disorders such as Alzheimer’s disease. The hallmark of FTLD-TDP (the form linked to defective PGRN) is the accumulation of TDP43, whose role in the disease is poorly understood. One of the reasons less is known about FTLD-TDP is that the current disease models in mice look don’t precisely mimic the way PGRN is mutated in patients. We developed a new model by introducing a mutation in PGRN gene associated with FTLD-TDP. In contrast to the earlier models, the mice in our study exhibit behavioral and cognitive symptoms that very closely mirror the disease pathology seen in humans.

Using this model, the researchers set out to understand what differentiates PGRN-mutant mice from their healthy counterparts. They focused their search on phosphorylation, a process that is normally involved in cell signaling but is often implicated in neurodegenerative diseases. Phosphorylated proteins have an additional chemical charge that can alter their behavior. In patients with FTLD-tau, as well as in Alzheimer’s disease, phosphorylation of tau is thought drive its accumulation in neurons.

The research team performed a comprehensive search for proteins that are phosphorylated when PGRN is mutated. Notably, they discovered that tau is phosphorylated and specifically localized to synapse in the mutant mice. This was a surprising find, given that tau does not accumulate and have not been implicated in the TDP form of the disease (FTLD-TDP). Nevertheless, they found that phosphorylated tau causes synapse loss, and may disrupt communication between neurons. The toxic tau was seen as early as 4 weeks in mice, while TDP43 did not appear until 24 weeks—suggesting that tau may play a more important role early in the disease.

Our study shows that tau phosphorylation (but not tau aggregation) is central to the pathology of both forms of FTLD as well as of Alzheimer’s disease. In the case of FTLD-TDP, phosphorylated tau appears to drive early synapse changes long before TDP43 protein aggregates appear. The therapeutic implications of the study are clear, as the findings suggest that targeting tau phosphorylation may be an effective way to treat the disease at its earliest stages.

Over the course of the study, the team uncovered a number of molecular events that cause mutated PGRN to lead to tau phosphorylation. With many of the key signaling players now identified, the team is hopeful that future efforts can focus on possible treatment strategies for this form of the disease.

Tau pathway looks to be a very promising treatment target for familial FTLD associated with PGRN mutations. We’re very excited to see how our findings will eventually translate into clinical improvement for these patients.
(3) Education

As educational tasks, we have lecture and experiment classes of neuropathology for medical/dental graduate school program and medical school program. We also have general pathology and neuropathology classes for graduate school for health sciences, and clinical anatomical and therapeutic pathology classes for research students.

(4) Lectures & Courses

We provide students with opportunities to learn practical research techniques on neuropathology, especially neurodegenerative diseases.

(5) Publications

[Original Articles]


3. Fujita K., Motoki K., Tagawa K., Chen X., Hama H., Nakajima K., Homma H., Tamura T., Miyawaki A., Okazawa H.. HMGB1 triggers neurite degeneration via TLR4-MARCKS, and is a potential therapeutic target for alzheimer's disease JOURNAL OF THE NEUROLOGICAL SCIENCES. 2017.10; 381; 64-65


[Misc]


2. Hitoshi Okazawa. PQBP1, an intrinsically disordered/denatured protein at the crossroad of intellectual disability and neurodegenerative diseases. Neurochem Int.. 2017.06;

[Conference Activities & Talks]

1. Hitoshi Okazawa. Impaired DNA Damage Repair in SCA1 and Other CAG Repeat Diseases. Gordon Research Conference - CAG Triplet Repeat Disorders 2017.06.06 Mount Snow Grand Summit Hotel (Vermont,America)


8. Kyota Fujita, Kazumi Motoki, Kazuhiko Tagawa, Xigui Chen, Hiroshi Hama, Kazuyuki Nakajima, Hidenori Homma, Takuya Tamura, Atsushi Miyawaki, Hitoshi Okazawa. HMGB1 TRIGGERS NEURITE DEGENERATION VIA TLR4-MARCKS, AND IS A POTENTIAL THERAPEUTIC TARGET FOR ALZHEIMER'S DISEASE. XXIII World Congress of Neurology (WCN 2017) 2017.09.17 Kyoto International Conference Center (Kyoto, Japan)

9. Hitoshi Okazawa. Gene Therapy Against Spinocerebellar Ataxia. XXIII World Congress of Neurology (WCN2017) 2017.09.19 Kyoto International Conference Center (Kyoto,Japan)


11. Hitoshi Okazawa. HMGB1 and Neurodegeneration. 8th International DAMPs and Alarmins Symposium (iDEAs) 2017.11.06 Cold Spring Harbor Laboratory (New York,America)

12. Hitoshi Okazawa. Common pathologies across multiple neurodegenerative diseases revealed from unbiased approaches. 12th International Symposium of the Institute Network 2017.11.28 The Institute of Medical Science, The University Of Tokyo
Ophthalmology and Visual Science

Professor; Kyoko Ohno-Matsui
Specially-appointed professor; Makoto Aihara
Junior Associate Professor; Hiroshi Takase, Koju Kamoi, Takeshi Yoshida
Assistant Professor; Shintaro Horie, Tae Yokoi, Tomoka Ishida, Kousei Shinohara
Graduate student; Natsuko Nagaoka, Minami Uchida, Keijia Cao, Yuxin Fang

(1) Outline

Our department was established in 1944. Prof. Jin Ohtsuka initiated research on myopia in 1946, and Emeritus Prof. Takashi Tokoro established high myopia clinic in 1974 as the world only clinic specific to pathologic myopia. To date, clinical practice as well as basic research on myopia have continuously been performed in our department. Uveitis clinic was established by Emeritus Prof. Manabu Mochizuki in 1988. Since Prof. Kyoko Ohno-Matsui was appointed to a professorship in our department, clinical practice and basic research on wide variety of fields such as glaucoma, cataract, diabetic retinopathy, vitreoretinal disorder, and macular diseases in addition to myopia and uveitis have been actively performed.

(2) Research

1. High myopia
   1) Analysis of retinochoroidal complications in high myopia (choroidal neovascularization, myopic tractional retinopathy)
   2) Evaluation of the molecular mechanism of choroidal angiogenesis using the cultured cells as well as experimental animals (collaboratory project with Department of Cellular Physiological Chemistry)
   3) Gene analysis of highly myopic patients (collaborator project with Kyoto University)
   4) Establishment of a novel therapy to prevent an axial elongation or the formation of posterior staphyloma

2. Ocular immunology and inflammation
   1) Evaluation of the molecular mechanism of immunoregulation in intraocular inflammation
   2) Pathogenic mechanism of intraocular inflammatory diseases
   3) Development of novel treatments of intraocular inflammation
   4) Molecular diagnosis of virus-infected uveitis and intraocular lymphomas.

3. Neuro-ophthalmology
   1) Evaluation of the change of the circulation as well as the glucose metabolism in the visual cortex using positron emission tomography (PET) in various ocular disorders
   2) Mechanism of visual pathway in normal conditions as well as in the patients with amblyopia.

4. Vitreoretinal disorder
   1) Development of a novel treatment for vitreoretinal disorders like retinal detachment, diabetic retinopathy, and macular holes.

5. Strabismus and amblyopia clinic
   1) Effect of the visual background on binocular vision as well as the influence of strabismus on dynamic visual acuity.
(3) Education

Undergraduate education of ophthalmology is composed of 1) classes on histology and physiology of the eye, and on diagnosis and treatment of ocular disorders, 2) combination block in which clinical examination is trained, and the diagnostic process is actively learned through group discussion using case series, 3) pre-clerkship and clerkship in which the medical students practically learn the major ocular disorders by seeing the patients and discussing in the conference.

After the initial residency of the first two years, the residency in ophthalmology in programmed for four years according to the educational program on diploma of ophthalmology by Japanese ophthalmological society. The graduate students are expected to be academic doctors who develop and perform highly-qualified ophthalmologists, as well as become scientists who can perform basic research focusing on their clinical interest.

(4) Lectures & Courses

Main objective of ophthalmology and visual science in the graduate course is to obtain the highly-advanced knowledge in the diagnosis and the treatment of various ocular disorders and to perform the basic research based on clinical experience.

(5) Clinical Services & Other Works

Clinical practice is organized by the general ophthalmology clinic as well as the several subspecialty clinics. When the patients visited our department, they are screened in the general clinic, and then the final decision of the diagnosis and treatment is made in cooperation with each subspecialty clinic. Subspecialty clinics include high myopia clinic, uveitis clinic, glaucoma clinic, vitreoretinal disorder clinic, diabetic retinopathy clinic, neuro-ophthalmology clinic, and medical retina clinic. Approximately, 1,300 surgeries are performed per year (e.g., cataract surgery, vitreoretinal surgery, glaucoma surgery, strabismus surgery).

(6) Publications

[Original Articles]


10. Suga M, Shinohara K, Ohno-Matsui K. Lacquer cracks observed in peripheral fundus of eyes with high myopia. Int Med Case Rep J. 2017.04; 10; 127-130


13. Kaori Kasahara, Muka Moriyama, Kei Morohoshi, Takeshi Yoshida, Noriaki Simada, Natsuko Nagaoka, Tae Yokoi, Kosei Shinohara, Yuichiro Kaneko, Mitsuki Suga, Kyoko Ohno-Matsui. SIX-YEAR OUTCOMES OF INTRAVITREAL BEVACIZUMAB FOR CHOROIDAL NEOVASCULARIZATION IN PATIENTS WITH PATHOLOGIC MYOPIA. Retina .. 2017.06; 37(6); 1055-1064


20. Ishida T, Yoshida T, Shinohara K1, Cao K, Nakahama K, Morita I, Ohno-Matsui K. Potential role of sirtuin 1 in Müller glial cells in mice choroidal neovascularization PLoS One. 2017.09; 12(9);


[Misc]

[Conference Activities & Talks]
1. Ohno-Matsui K. RETINA JEOPARDY English session . 1st TOKYO RETINA JEOPARDY 2017.02.21 Tokyo
2. Ohno-Matsui K. Influence of Myopic Macular Degeneration Severity on Treatment Outcomes of Myopic Choroidal Neovascularization in the MYRROR Study. 2017APA O 2017.03.03
3. Ohno-Matsui K. Myopic CNV. 2017APA O 2017.03.04
5. Ohno-Matsui K. The impact of pathologic myopia on visual impairment in asia and beyond. 2017APA O 2017.03.04 Singapore(Suntec Singapore)
6. Ohno-Matsui K. Randomized trials on treatment of myopic CNV: MYRROR and RADIANCE. 2017APA O 2017.03.04 Singapore(Suntec Singapore)
8. Wei C, Kamoi K, Ando N, Ohno-Matsui K. HTLV-1 virus infection to intraocular tissues contribute to the development of HTLV-1 uveitis. HTLV2017 2017.03.07 Tokyo
9. Hiroshi Takase. Proposal of Revised IWOS Diagnostic criteria. 6th International Workshop on Ocular Sarcoidosis 2017.04.28 Bali, Indonesia
10. Jonas JB, Ohno-Matsui K, Nagaoka N, Weber P. Parapapillary delta zone as risk factor of glaucoma in high myopia. ARVO 2017.05.11 Baltimore,USA
11. Ohno-Matsui K. Being too thin is not always a bad thing for choroid. 40th Annual Macula Society Meeting 2017.06.07 Singapore
18. Ohno-Matsui K. What is the origin of myopic CNV?. MaculaART 2017 2017.07.05 Paris, France


23. Ohno-Matsui K. Strange pattern of choroidal thickening; It was not just VKH… The retina society meeting2017 2017.10.05 Boston, USA

24. Ohno-Matsui K, Shinohara K. Ultra-widefield OCT method to advance the visualization of posterior staphylomas and accompanying vitreoretinal changes in pathologic myopia. The retina society meeting2017 2017.10.07 Boston, USA


Otorhinolaryngology

Professor: Takeshi Tsutsumi
Associate Professor: Yoshiyuki Kawashima
Junior Associate Professor: Yasuhiro Suzuki
Assistant Professor: Taku Itou, Tarou Fujikawa, Yuichiro Inaba
Hospital Staff: Takamori Takeda, Natsuko Kurata, Yumiko Tateishi,
Kohei Kajino, Tomoki O-oka
Graduate Student: Keiko Ohno, Ayane Makabe, Takamori Takeda, Ayako Maruyama, Yusuke Kiyokawa,
Motomu Honjo

(1) Research

1) Deafness gene analysis
2) Neurophysiological study of hearing
3) Histoanatomical study of ear, nose, throat, head, and neck
4) Eye movement analysis in patients with dizziness
5) Clinical study of treatment and prognosis in patients with allergic rhinitis, acute and chronic sinusitis, and benign tumors
6) Treatment of tinnitus
7) Treatment using endoscope
8) Development of a new mapping procedure for cochlear implant
9) Bio-Marker of external ear canal carcinoma

(2) Lectures & Courses

Pre-graduate clinical education
Clinical systematic lecture covers anatomy, a general idea of diseases, their pathological conditions and treatments in the field of otorhinolaryngology. Clinical clerkship I (general diagnostic training) provides instruction in the diagnosis and testing techniques of the otorhinolaryngological field; clinical clerkship II (clinical training) provides detailed explanations of disease mechanisms, training in the performance of examinations, and clinical responsibilities involving both inpatient and outpatient care. Clinical clerkship III provides advanced training beyond the scope of clinical clerkship II. In particular, students develop an advanced understanding of otorhinolaryngological diseases by conducting outpatient procedures (including taking histories, visual inspection, and palpation), and gaining practical experience in assessment and diagnosis of patients’ conditions. Furthermore, in the clinical clerkship III, students also attend a “micro-conference” on teaching. Finally, students are assigned to patients throughout their treatment, consistently dealing with the same individuals before, during, and after surgery; this allows the students to become familiar with the course of clinical care.

(3) Clinical Performances

Otorhinolaryngology clinic provides full examinations and treatment for diseases in ear, nose, throat, head, and neck, including dizziness, sudden deafness, facial palsy, infectious disease and benign as well as malignant disease in the otorhinolaryngeal area. We have performed the first implementation of bone anchored hearing aid implant in Japan and since then we have experienced many patients for this surgery. We also have performed
surgery for patients with malignant disease as well as skull base lesions in collaboration with the Department of the Head and Neck Surgery. Our outpatient clinic includes general ear, nose and throat clinic as well as allergy, sinusitis, dizziness, otitis media, tumor, deafness, and tinnitus clinic.

(4) Publications

[Original Articles]

1. Hirai Chiaki, Yamamoto Yukiko, Takeda Takamori, Tasaki Akihisa, Inaba Yuichiro, Kiyokawa Yusuke, Suzuki Yasuhiro, Tsutsumi Takeshi. Nystagmus at the Onset of Vertiginous Attack in Ménière’s Disease. Otology & Neurotology. 2017.01; 38(1); 110-113

2. Yurie Mori, Yoshiyuki Kawashima, Masatoki Takahashi, Ayako Maruyama, Taro Fujikawa & Takeshi Tsutsumi. Bilateral cochlear ossification in a patient with Takayasu arteritis Acta Oto-Laryngologica Case Reports. 2017.01; 2(1); 150-154


7. Ayako Maruyama, Atsunobu Tsunoda, Masatoki Takahashi, Seiji Kishimoto, Masami Suzuki. Nasopharyngeal pleomorphic adenoma presenting as otitis media with effusion: case report and literature review. Am J Otolaryngol. 35(1); 73-76

[Conference Activities & Talks]

1. Tsutsumi T, Makabe A, Hirai C, Yamamoto Y, Takeda T, Kawashima Y.. Time course of caloric nystagmus in cases with spinocerebellar degeneration.. ARO 40th Annual MidWinter Meeting 2017.02.11 Baltimore

2. Taro Fujikawa, et al.. Malnutrition and Delirium Interrupt Postoperative Swallowing Improvement in Elderly Patients with Head and Neck Cancer. The 14th Taiwan-Japan Conference on Otolaryngology- Head and Neck Surgery 2017.12.01
Neurology and Neurological Science

Professor YOKOTA Takanori
Junior Associate Professor ISHIBASHI Satoru
Junior Associate Professor NISHIDA Yoichiro
Assistant Professor OHKUBO Takuya
Assistant Professor SATO Nozomu
Assistant Professor OZAKI Kokoro
Assistant Professor HATTORI Takaaki
Assistant Professor NUMASAWA Yoshiyuki
Project Professor SANJO Nobuo
Project Junior Associate Professor NAGATA Tetsuya
Project Assistant Professor KUWAHARA Hiyori
Project Assistant Professor YOSHIOKA Kotaro
Project Assistant Professor YUI Daishi
Project Assistant Professor SAKAUE Fumika
Project Researcher ASADA Ken
Graduate Student ITO Yoko
Graduate Student HIGASHI Miwa
Graduate Student Yagi Yousuke
Graduate Student ZENIYA Satoshi
Graduate Student IWASAWA Eri
Graduate Student OHYAGI Masaki
Graduate Student HASEGAWA Jyuri
Graduate Student SHINTAKU Hiroshi
Graduate Student FURUKAWA Fumiko
Graduate Student MIYASHITA Akiko
Graduate Student FUJITA Kyohei
Graduate Student MAJIMA Takamasa
Graduate Student ONO Daishi
Graduate Student HIRATA Kose
Graduate Student ISHIZU Nobutaka
Graduate Student LI Fu Ying
Graduate Student SONG Jin Dong
Graduate Student GUO Huijia
Graduate Student HU Yajun
Graduate Student ZHANG Yong Quan
Graduate Student SU SU Lei Mon
Graduate Student REYILA Mamuti
Graduate Student MAMUTI HASIYATI
Graduate Student DAIZO Kaiichi
Graduate Student YASUDA Eiji
Graduate Student MITSUHASHI Yuta
Graduate Student TAMURA Keigo
Graduate Student KUNIEDA Taiki
Research Student SANO Tatsuhiko
Research Student TAMAKI Toshihiro
Cognitive and Behavioral Medicine

(1) Research

1) Development of base technology on nucleic acid medicine and its application to neurological disorders
2) Discovery of biomarker in body fluid for neurological diseases
3) Pathogenesis of Alzheimer disease
4) Pathogenesis and therapies of amyotrophic lateral sclerosis (ALS)
5) Pathogenesis and therapies of cerebrovascular diseases
6) Genetical and pathomechanical studies of spinocerebellar ataxias
7) Regulation of blood-brain barrier
8) Electrophysiological studies
9) Leading-edge neuroradiological studies
10) Neuropathological studies of biopsied and autopsied samples

(2) Lectures & Courses

Neurology is a medical specialty concerned with the diagnosis and treatment of disorders of the nervous system including the brain, spinal cord, peripheral nerves, autonomic nervous and skeletal muscles. Since the nervous system extends to the whole body and regulate all the organs, neurologists have to examine and understand many symptoms of the whole brain and body.
The Department of Neurology and Neurological Science at Tokyo Medical and Dental University offers a unique "clinical neurological training for specialist" in a three-year residency program. This program is designed to provide the highest quality clinical training in the clinical practice of neurology, either in an academic or a practice career. To accomplish this, the program integrates extensive practical exposure to all aspects of current clinical neurology with a firm grounding in underlying scientific principles and methods of clinical investigations such as electrophysiology, neuromuscular pathology, stroke, dementia, neuroimaging, and neurogenetics. The faculty and staff are committed to facilitate resident education and training.
After completion of their training for three years, senior residents are equipped with a lot of clinical experience as attending doctors or teaching assistants in the university hospital and affiliated hospitals. They are eligible for the board certification by the Japanese Society of Neurology.

(3) Clinical Services & Other Works

We daily see about 100 out-patients and 36 in-patients, and offer in- and out-patient consultation services through the weekday and on weekends. We diagnose and treat patients with stroke, multiple sclerosis, Parkinson's disease, spinocerebellar ataxia, ALS, myopathies, neuropathies, meningitis/encephalitis, and hundreds of other neurological issues. We also have the "out-patients clinic specialized to patients with amnesia." Our patients will be reliably evaluated and diagnosed with some skillful techniques, such as the electrophysiological, neuroradiological, and neuropsychological tests and pathological diagnosis of biopsied nerves and muscles.

(4) Publications

[Original Articles]

2. Keisuke Abe, Takuya Ohkubo, Takanori Yokota.. TDP-43 in the skin of amyotrophic lateral sclerosis patients. Journal of Medical and Dental Sciences. 2017.01; 64(1); 9-17


10. Akane Yamada, Yoshiyuki Numasawa, Takaaki Hattori, Kokoro Ozaki, Yoichiro Nishida, Satoru Ishibashi, Tadashi Kanouchi, Nobuo Sanjo, Takanori Yokota. Signal changes of skeletal muscle MRI in peripheral nerve disorders. XX III World Congress of Neurology 2017.09.16


15. Miwa Higashi, Kokoro Ozaki, Takaaki Hattori, Takashi Ishii, Kazumasa Soga, Nozomu Sato, Makoto Tomita, Hidehiro Mizusawa, Kinya Ishikawa, and Takanori Yokota. Pontine magnetic resonance imaging findings differentiate the spinocerebellar degeneration subgroups. XX III World Congress of Neurology 2017.09.16


18. Tadashi Tsukamoto, Nobuo Sanjo, Tsuyoshi Hamaguchi, Yoshikazu Nakamura, Tetsuyuki Kitamoto, Masahito Yamada, Hidehiro Mizusawa, and Prion Disease Surveillance Committee, Japan. Analysis of cases in which prion disease was denied by the Prion disease Surveillance Committee in Japan in 2016. Asia Pacific Prion Symposium 2017.10.20 Melbourne, Australia


[Patents]

1. CHIMERIC DOUBLE-STRANDED NUCLEIC ACID, Patent Number : 9816089
Psychiatry and Behavioral Sciences

Professor
Toru NISHIKAWA, Takayuki OKADA
Associate Professor
Akeo KURUMAJI
Junior Associate Professor
Takashi TAKEUCHI
Assistant Professor
Daisuke JITOKU, Akihito UEZATO, Yuichiro ABE (~ 2017.1), Hitoshi MUTO, Takehiro TAMURA, Takako NAKANOTANI Kazuo TAKIGUCHI (~ 2017.2)
Medical Staff
Hiroki SHIWAKU, Kohei MISE, Satoshi TAKAHASHI, Tomonori TOMISHIGE (~ 2017.3), Masashi NAGASE (~ 2017.3), Mariko SUNAHARA (~ 2017.3), Koutarou KAWAMATA (~ 2017.4), Ryota SHIOE (~ 2017.4)
Research assistant
Masakazu UMINO (~ 2017.4)
Technical Assistant
Asami UMINO, Masakazu UMINO (~ 2017.3)
Clinical Psychologist
Kazunori MURAKAMI, Yukari WAKAYAMA, Yasuhiro OKA, Hisashi YAMADA, Toshikazu SHINOTAKE (~ 2017.5)
Psychiatric Social Worker
Yoshifumi KANEKO, Noriko NUMAGUCHI, Sayaka KOJIMA (~ 2017.2), Norikazu MONTA (~ 2017.3), Sumiko NOGUCHI (~ 2017.4)
Graduate Students
Masakazu UMINO, Kazuo TAKIGUCHI, Momoko KOBAYASHI, Megumi GOTO, Ko FURUTA, Shigeo OGATA, Hidetoshi KINOSHITA, Ryotaro SAITO, Koji TAKEDA, Takehiro TAMURA, Yosuke SEKIGUCHI (~ 2017.4), Yoshiko NOMURA (~ 2017.4), Asami ISHIZUYA (~ 2017.4)

(1) Outline

Our laboratory is committed to comprehensive research on endogenous psychosis, neurosis, and epilepsy through biological, psychological and social approaches. In collaboration with external research facilities, we are also involved in social psychiatry, child and adolescent psychiatry, and brain imaging studies.

(2) Research

1) Studies in neurochemistry
   (i) Molecular genetic studies to clarify the causes and conditions of neuropsychiatric diseases:
   Using animal models with psychotic symptom-causing agents, we are involved in a study to isolate new candi-
date gene clusters associated with the pathogenesis and pathophysiology of neuropsychiatric disorders from the viewpoint of developmental pharmacology. We are examining the effects of candidate gene clusters in patients with neuropsychiatric disorders.

(ii) Studies in biochemical pharmacology to develop new therapeutic methods for neuropsychiatric disorders.

2) Neurophysiological and psychophysiological studies

(i) Studies of neurotransmitter receptor binding in neuropsychiatric disorders with PET: We are working together with the National Institute of Radiological Sciences to investigate the binding activities of dopamine receptors in various brain areas of the patients with schizophrenia and mood disorders.

(ii) A study of sleep stages and behavior in neuropsychiatric diseases: A study is being carried out to examine sleep stages and behavior using an originally developed automatic analysis device (polysomnography) in patients with various psychiatric disorders.

A study on brain functioning in psychiatric disorders by using the near-infrared spectroscopy (NIRS): To obtain an insight into biological markers of psychiatric disorders, changes in regional brain functions during psychological tasks are examined by measuring the relative concentrations of oxyhemoglobin using NIRS in combination with MRI in the brain areas of the patients with schizophrenia and mood disorders.

3) Psychopathological studies

We are conducting psychological studies of neuropsychiatric diseases from the aspects of phenomenology, anthropology, and linguistics, while employing a psychotherapeutic approach. Other research activities include a review of basic psychiatric concepts and a basic study for the classification and diagnosis of psychiatric disorders, which are important recent issues. In addition to endogenous psychosis including schizophrenia and manic depressive disorder, we are also involved in psychoanalytic studies of neurosis and borderline personality disorder, which are attracting increasing attention, and psychotherapies for them, as well as pathological research on pathography and art therapy in terms of creativity.

(3) Education

Following the two-year period of mandatory clinical training, basic professional training in psychiatry will be provided for 6-9 months mainly in the university. In the second term of training, they will acquire knowledge and clinical experience necessary for neuropsychiatrists, and undergo practical training at affiliated medical facilities to become qualified psychiatrists. Undergraduate education, which places emphasis on clinical clerkship training after a systematic series of lecture course and seminar-based classes, is designed to develop students’ problem-solving skills, and increase their motivation to learn neuropsychiatry, with support from external facilities.

(4) Lectures & Courses

In the first term (two years) of postgraduate training, residents will learn basic laboratory procedures and diagnostic techniques, psychotherapy and drug treatment and laws and regulations related to clinical practice, and acquire other general knowledge, all being essential for biologic, psychological, social, and ethical approaches to neuropsychiatric diseases.

(5) Clinical Services & Other Works

Clinical practice

Approximately eighty new outpatients visit our department every month, about 30% of which are classified as having "mood disorders" (F3) by ICD-10, followed by "neurotic, stress-related, and somatoform disorders" (F4) and "schizophrenia, schizophrenic and paranoid disorders" (F2). We are also actively involved in consultation and liaison psychiatry for inpatients in other departments. Patients with mild dementia, child and adolescent psychiatric disorders, substance, dependence, and neurosis requiring intensive psychotherapy are often referred to related and advanced facilities for specialized treatment. Since this facility, the psychiatric department of a general hospital, is used for university education and training, most inpatients are classified as F2, followed by F4 and F3 (ICD-10). We also provide care and treatment for patients with sleep rhythm disorders and neurological disorders, including epilepsy and senile dementia. In addition to drug treatment, we have introduced and provided mECT (modified electroconvulsive therapy) for inpatients, and individual and group psychotherapy for the patients in our psychiatric ward and clinic and day care center in close collaboration with rehabilitation facilities in the community. The day care team consists of a doctor, two nurses. And a psycho-social-worker or a clinical psychologist. Day care (partial hospitalization) is the transitional element between inpatient and outpatient care and its indications have a wide range of psychiatric disorders as follows: schizophrenia,
depression, bipolar disorder, adjustment disorder and personality disorders. Each member has the own aim and the team gives care with different types of framework. Our day care team regards the potentiality of group very important and the group process could contribute to therapeutic effect. With this kind of experience, patients could develop their ability to communicate with other people and readapt to social situations.

(i) A study of biological indicators in schizophrenia with eye cameras:
We are not only involved in studies of monozygotic twins, early-onset patients, and children at a high risk in Japan, but also in an international joint research project of the WHO as a center in charge of operations.

(6) Clinical Performances
Since the 2011 fiscal year, we have been conducting the clinical trial of D-cycloserine for negative symptoms such as avolition, flattening of affect, and poverty of thought and cognitive dysfunction of schizophrenia. We also have been treating patients with schizophrenia with clozapine, which has been approved for refractory schizophrenia. We have started getting systematically involved in the treatment of patients complaining of pain or dysesthesia in oral regions in liaison with the Dental Hospital, which is the unique characteristics of our university. In the 2014 fiscal year, we started the psychoeducational program for patients with bipolar disorder, which focuses on the prevention of relapse. In addition, there is an increasing number of liaison activities for the prevention of delirium especially in the surgical wards, the intervention to patients with suicide attempts in the emergency room, and the mental support for peripartum patients in cooperation with the staffs.

(7) Publications

[Original Articles]


3. An adolescent case of steroid psychosis with ulcerative colitis 2017.02; 32(2); 259-264

4. Ishiwata S, Hattori K, Sasayama D, Teraishi T, Miyakawa T, Yokota Y, Matsumura R, Yoshida F, Nishikawa T, Kunugi H. Plasma and cerebrospinal fluid G72 protein levels in schizophrenia and major depressive disorder. Psychiatry Res.. 2017.04; (254); 244-250

5. Shiwaku H, Kimura Y, Narushima M, Matsuda H, Nishikawa T. Unilateral atonia and asymmetric cholinergic dysfunction in the ROSS syndrome. Biol Psychiat.. 2017.05; 83(2); e31-e32

6. Akeo Kurumaji, Michio Itasaka, Kazuo Takiguchi, Daisuke Jitoku, Mizue Hobo, Toru Nishikawa. A distinctive abnormality of diffusion tensor imaging parameters in the fornix of patients with bipolar II disorder. Psychiatry Res. 2017.06; 266; 66-72


effect of D-cycloserine: a randomized placebo-controlled double-blind crossover study. BMC Psychiatry. 2017.07; 17(1); 249

9. Add-on treatment with mood stabilizer on schizophrenia 2017.07; 20(7); 837-839


13. Shiwaku H, Umino A, Umino M, Nishikawa T. . Involvement of neuronal and glial activities in control of the extracellular D-serine concentrations by the AMPA glutamate receptor in the mouse medial prefrontal cortex. Neurochem Int.. 2017.08; in press;

14. Ishiwata S, Umino A, Nishikawa T. . Involvement of neuronal and glial activities in control of the extracellular D-serine concentrations by the AMPA glutamate receptor in the mouse medial prefrontal cortex. Neurochem Int.. 2017.08; in press;


[Misc]

1. Relationship between sunlight and the age of onset of bipolar disorder: An international multisite study 2017.04;
Neurosurgery

Professor: Taketoshi Maehara
Associate Professor: Tadashi Nariai
Assistant Professors: Yoji Tanaka and Motoki Inaji
Hospital staffs:
Takashi Sugawara, Kaoru Tamura, Takumi Kudo and Kazuhide Shimizu
Graduate Students: Masahumi Sasaki, Yoshiteru Obata, Yousuke Ishii,
Sakyo Hirai, Yasuhiro Ueda, Jun Karakama, Takahiro Ogishima, Shihori Hayashi, Kenji Yamada,
Shouko Hara, Satoka Hashimoto and Masataka Yoshimura

(1) Outline
There are various attracting subjects in the field of clinical or basic research. It is essential to acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the central nervous system and spinal cord, which will directly benefit for the improvement of clinical results. Main educational purpose of neurosurgery in the graduate course is to provide students opportunity to acquire the proper technique as well as the broad knowledge, and to nurture the mind of exploration.
In the clinical practice, it is important to attach priority to the patients, considering their background. Also in surgery, it is important to preserve the normal brain functions by employing the cutting edge technique. In the research field, it is essential to introduce and develop the latest knowledge and technology by establishing the reciprocal relationship with the other laboratory institutions.

(2) Research
Brain tumors
1. Analysis of the mechanism of tumor proliferation and infiltration, and its application to treatment
2. Analysis of both proliferative and inhibitory cancer genes in cerebral and spinal tumors
3. Studies of photodynamic therapy, irradiation therapy, agents of chemotherapy, immunotherapy, and inhibition of angiogenesis

Vascular diseases in the central nervous system and spinal cord
1. Analysis of pathogenesis of vasospasm after subarachnoid hemorrhage and its application to treatment
2. Studies of circulatory disturbance in ischemic and hemorrhagic diseases, and reversibility of the brain tissue
3. Investigations of pathology of Moyamoya disease and the effects of indirect surgical anastomosis on this entity
4. Solutions of problems in the development of endovascular surgery

Neurotrauma
1. Analysis of cell damage and its reversibility, dynamic simulation in cerebrospinal injury
2. Animal experiments concerning treatment of cerebrospinal injury

Functional neurosurgery
1. Pathological analysis and treatment of temporal lobe epilepsy
2. Analysis of intracellular signal transductions
Cognitive and Behavioral Medicine

Others
1. Studies of human cerebral circulation, metabolism, and functions using PET, MRI/S, and MEG
2. Studies of receptors in the central nervous system using PET
3. Experiments of brain diseases using animal model MRI and PET

(3) Clinical Services & Other Works

Neurosurgery is a clinical department dealing with various diseases of central nervous system and spinal cord including tumors, vascular diseases, trauma, congenital malformation, functional disorders, and infection.

(4) Publications

[Original Articles]


8. Shimpei Baba, Yuji Sugawara, Kengo Moriyama, Motoki Inaji, Taketoshi Maehara, Toshiyuki Yamamoto, Tomohiro Morio. Amelioration of intractable epilepsy by adjunct vagus nerve stimulation therapy in a girl with a CDKL5 mutation. Brain Dev. 2017.04; 39(4); 341-344


12. Kei Wagatsuma, Keiichi Oda, Kenta Miwa, Motoki Inaji, Muneyuki Sakata, Jun Toyohara, Kiichi Ishiwata, Masayuki Sasaki, Kenji Ishii. O-labeled gas. The image quality with the neck shield was similar to that without the neck shield. Radiol Phys Technol. 2017.12; 10(4); 422-430


[Misc]

[Conference Activities & Talks]


9. A case of Female Neurosurgeon in Department of Neurosurgery, Tokyo Medical and Dental University. 50th Anniversary of Department of Neurosurgery, Tokyo Medical and Dental University 2017.11.11 Tokyo


[Awards & Honors]

1. ICMRI2017 Scholarship, ICMRI2017 Organizing Committee, 2017.03
Endovascular Surgery

Outline

There are various attracting subjects in the field of clinical or basic research. It is essential to acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the vascular system, which will directly benefit for the improvement of clinical results. Main educational purpose of Endovascular Surgery in the graduate course is to provide physicians/students opportunity to acquire the proper technique as well as the broad knowledge, and to nurture the mind of exploration.

Research

Our experimental research program is objected to elucidate unsolved questions derived from daily clinical experience. To treat vascular diseases of central nervous system, facial and head-neck legions, we need to understand detailed vascular anatomy, accurate function of these organs and exact pathophysiology of each disease. Our essential research target is the hemodynamics in the vascular diseases of these lesions. Especially we are interested in the integration of the fluid engineering technology into the endovascular field in an effort to open a new frontier of surgical treatment.

Education

Course objects of Endovascular Surgery in the graduate course is to acquire the proper technique as well as the basic knowledge of neuroendovascular surgery.

Lectures & Courses

Main educational purpose of Endovascular Surgery in the graduate course is to provide students the proper technique as well as the basic knowledge of neuroendovascular surgery.

Clinical Services & Other Works

Our major clinical and extracurricular activities are as follows. 1. Endovascular surgery for diseases of central nervous system, facial and head-neck legions. 2. Analysis of cerebrovascular diseases using computational fluid dynamics (CFD). 3. Development of integrated training system for the endovascular surgery.
Clinical Performances

Endovascular Surgery is a clinical department dealing with various vascular diseases of central nervous system, spinal cord, facial and head-neck lesions including tumors, congenital malformation, and functional disorders.

Publications

[Original Articles]

[Conference Activities & Talks]
1. Shigeru Nemoto. Characteristics and problems of clot retrieving devices — study with artificial clot and endovascular simulation system. ABCWIN Seminar 2017 Anatomy-Biology-Clinical Correlations (ABC) / Working Group of Interventional Neuroradiology (WIN) 2017.01.18 Val d’Isere France
3. Miki K, Karakama J, Yoshino Y, Nemoto S. Three cases of dual antiplatelet therapy resistance in patients undergoing carotid artery stenting and stent assisted coil embolization. XXIII World Congress of Neurology 2017.09.16 Kyoto, Japan
4. Shigeru Nemoto. Endovascular revascularization of chronic total occlusion of the internal carotid artery. The 14th congress of WFITN 2017.10.16 Hungary
NCNP Brain Physiology and Pathology

1. Staffs

Collaborative Professor    Mikio HOSHINO
Collaborative Professor    Yu-ichi GOTO
Collaborative Professor    Hiroshi KUNUGI
Collaborative Professor    Takashi HANAKAWA
Collaborative Professor    Noritaka ICHINOHE
Collaborative Associate Professor    Yoshitsugu AOKI

(1) Research

1) **Investigation of the molecular machinery underlying brain development.**
   (Mikio Hoshino; Department of Biochemistry and Cellular Biology, National Institute of Neuroscience, NCNP)
   We are investigating molecular machinery underlying nervous system development, especially focusing on neuron-subtype specification, nervous system regionalization and neuronal migration. We are also interested in human diseases/disorders caused by disorganized development of the nervous system.
   We analyzed the relationship between cell division angles and daughter cell fates of cerebellar granule cell precursors (Miyashita et al) and roles of Meis1 in granule cell development (Owa et al).

2) **Molecular genetic and genomic study for intellectual disability in Japan.**
   (Yu-ichi Goto, Department of Mental Retardation and Birth Defect Research, National Institute of Neuroscience, NCNP)
   One of the major causes of intellectual disability (ID) is based on mutations in the related genes, which are timely and locally expressed in concert with one another in central nervous system. ID is a phenotype derived from the inappropriate expression of these genes. Recent advances in molecular genetics and genome medicine have pushed us on with systematic analysis of ID patients, especially on X-linked MR. In 2013, we investigated the genetic causes and pathophysiology of mitochondrial disease, Rett syndrome, and diseases with cortical and white matter dysplasia. We detected somatic mutations in surgically dissected brains of cortical dysplasia (Hanai S, et al. Am J Pathol, 2017), and novel causing gene of Arima syndrome which is similar to Joubert syndrome (Itoh M, et al. Brain Dev, 2018) and we studied a recovery effect of low-dose resveratrol on defect of differentiation of iPS cells from mitochondrial disease.
3) **Clinical research on mood disorders and schizophrenia**  
(Hiroshi Kunugi, Department of Mental Disorder Research, National Institute of Neuroscience, NCNP)  
The pathogenesis and physiology of mood disorders and schizophrenia remain elusive, and their biomarkers have not yet been established. Our department, which is in collaboration with the National Center of Neurology and Psychiatry Hospital, is trying to develop objective diagnostic markers for these diseases, employing omics approach, brain imaging, and physiological studies. We also aim to develop new treatment on the basis of key molecules and nutrition. In this year, we reported that dopamine metabolite could be a state-dependent marker for depressive disorder (J Clin Psychiatry, 2017). We used novel imaging method (diffusion kurtosis) and elucidated altered neural network in depressive disorder (J Psychiatr Res, 2018). As a nutritional approach, we reported that l-theanine a characteristic ingredient in the green tea has an anxiolytic-like effect and enhances regional glucose metabolism of the brain (Psychopharmacology, 2017).

4) **Noninvasive study on pathophysiology of human higher brain function.**  
(Takashi Hanakawa, Department of Advanced Neuroimaging, Integrative Brain Imagig Center, NCNP)  
We aim at revealing neural mechanisms underlying higher brain functions including sensory, motor, thought, emotion, and decision making functions in humans, by integrating innovative brain imaging techniques. Translational approach based on this methodological development is to find imaging biomarkers related to the pathophysiology of neuro-psychiatric disorders and to develop new diagnostic tools using the biomarkers. We also develop new rehabilitation methods using non-invasive brain stimulation and brain-machine interface.  
In 2017, we clarified both brain and non-brain signal sources in near-infrared spectroscopy (NIRS), which is now widely applied to the diagnosis of psychiatric disorders (Moriguchi et al. Hum Brain Mapp). We also evaluated and developed methods for resting-state fMRI (Togo et al. Front Neurosci; Ogata et al. Front Neurosci). For studies on pathophysiology of neurological disorders, we discovered the involvement of the parallel coritico-basal ganglia circuits in both bradykinesia and bradyphrenia in patients with Parkinson's disease.

5) **Primate Social brains: their development, anatomy, physiology and...**
patho-physiology.
(Noritaka Ichinohe, Department of Ultrastructural Research, National Institute of Neuroscience, NCNP)
We are aiming to elucidate the neural circuit mechanisms of primate social brain using Common Marmoset, new primate model animal. Emphases are on their development, anatomy, physiology and patho-physiology.
This year, we studied mechanisms of material perception, especially glossy materials at medial temporal sulcus (Miyawaka and Banno et al., Front Neural Circuits, 2017).

6) Molecular pathogenesis and gene therapies for neuromuscular diseases
(Yoshitsugu Aoki, Department of Molecular Therapy, National, National Institute of Neuroscience, NCNP)
Our research group focuses on genetic neuromuscular diseases including fatal Duchenne muscular dystrophy (DMD) and amyotrophic lateral sclerosis (ALS). Our lab integrates molecular, pharmacologic, proteomic and genomic methodologies to clarify the molecular mechanisms of disease pathogenesis and develop novel genetic therapies for the diseases. Especially, we are dedicated to the development of antisense-oligonucleotides based drugs for the diseases in collaboration with Profs. Matthew Wood, Oxford, Kevin Talbot, Oxford, Toshifumi Yokota, Alberta, Fazel Shabanpoor, Melbourne and Samir El-Andaloussi, Karolinska Institutet.
During the academic year 15/16, we have discovered a fundamentally disturbed molecular pathway in C9orf72-related ALS and frontotemporal dementia that identifies a novel extracellular vesicle trafficking, determines the molecular mechanisms and for the first time links ALS pathogenesis with extracellular vesicle biogenesis (Aoki et al., BRAIN, 2017). The goal of the laboratory is a better understanding and improved treatment of fatal and currently untreated neuromuscular diseases.

(2) Education
The nervous system is a very fine and complex organ to elicit the higher brain function and its malfunction causes a variety of neurological and psychiatric disorders in humans. In this course, students learn the structure, development and function of the normal nervous and muscle systems as well as pathology of developmental disorders, psychiatric disorders, neurological diseases and muscle diseases. Students also study the latest progress of advanced remedy for neuromuscular diseases.
(3) Publications

[Original Articles]


Cognitive and Behavioral Medicine


35. Ishii T, Hattori K, Miyakawa T, Watanabe K, Hidese S, Sasayama D, Ota M,


43. Hanakawa T, Goldfine AM, Hallett M: A common function of basal ganglia-cortical circuits subserving speed in both motor and cognitive domains. eNeuro 4(6), e0200-17, 2017.

[Review Articles • Books]

Immune Regulation

Professor Hajime Karasuyama, M.D., Ph.D.
Associate Professor Yoshinori Yamanishi, M.D., Ph.D.
Assistant Professor Yohei Kawano, Ph.D.
Assistant Professor Soichiro Yoshikawa, Ph.D.
Specially Appointed Assistant Professor Kensuke Miyake, M.D., Ph.D.

(1) Research

1) Role of basophils in immune disorders such as allergy
2) Role of basophils in protective immunity against infections
3) In vivo imaging of basophil-mediated immune responses

(2) Education

Main objective of the immunology course for undergraduate students is to provide them the basic ideas how the immune system works and is regulated in various physiological and pathological settings including infections, cancer, autoimmune and allergic disorders, and organ transplantation. In the immunology course for graduate students, they study molecular mechanisms underlying the development of immune diseases including allergy and parasitic infection, by employing advanced technology in molecular biology, biochemistry, cellular biology and developmental engineering.

(3) Publications

[Original Articles]


2. Hidemitsu Tsutsui, Yoshinori Yamanishi, Hiromi Ohtsuka, Shingo Sato, Soichiro Yoshikawa, Hajime Karasuyama. The Basophil-specific Protease mMCP-8 Provokes an Inflammatory Response in the Skin with Microvascular Hyperpermeability and Leukocyte Infiltration. J. Biol. Chem.. 2017.01; 292(3); 1061-1067

3. Yohei Kawano, Georg Petkau, Ingrid Wolf, Julia Tornack, Fritz Melchers. IL-7 and immobilized Kit-ligand stimulate serum- and stromal cell-free cultures of precursor B-cell lines and clones. Eur. J. Immunol.. 2017.01; 47(1); 206-212


Ko Okumura, Toshiro Kitamura, Jiro Kitaura. Disrupting ceramide-CD300f interaction prevents septic peritonitis by stimulating neutrophil recruitment. Sci Rep. 2017.06; 7(1); 4298


10. Takuya Ohta, Soichiro Yoshikawa, Yuya Tabakawa, Kayoko Yamaji, Kenji Ishiwata, Hiroshi Shitara, Choji Taya, Masatsugu Oh-Hora, Yohei Kawano, Kensei Miyake, Yoshinori Yamanishi, Hiroichichi Yonekawa, Naohiro Watanahe, Hirotsaka Kanuka, Hajime Karasuyama. Skin CD4+ Memory T Cells Play an Essential Role in Acquired Anti-Tick Immunity through Interleukin-3-Mediated Basophil Recruitment to Tick-Feeding Sites. Front Immunol. 2017.10; 8; 1348

[Misc]

1. Kensuke Miyake, Hajime Karasuyama. Emerging roles of basophils in allergic inflammation. Allergol Int. 2017.07; 66(3); 382-391


[Conference Activities & Talks]


2. Yoshinori Yamanishi, Misako Iki, Kensei Tanaka, Hayato Deki, Mio Fujimaki, Shingo Sato, Soichiro Yoshikawa, Hajime Karasuyama. Basophil tryptase mMCP-11 plays a crucial role in the IgE-mediated chronic allergic inflammation.. The 66th Annual Meeting of Japanese Society of Allergology 2017.06.15 Tokyo, Japan


4. Soichiro Yoshikawa, Masatsugu Oh-hora, Kensuke Miyake, Yohei Kawano, Yoshinori Yamanishi, Hajime Karasuyama. Prolonged Ca2+ influx via STIM2 is essential for cytokine-induced IL-4 production in basophil. The 46th Annual Meeting of The Japanese Society for Immunology 2017.12.12 Sendai, Japan


[ Awards & Honors ]

1. The Best Presentation Award for RIKEN IMS Summer Program 2017 (Kensuke Miyake), RIKEN IMS, 2017.06

Molecular Virology

(1) Outline

Microbiology covers several aspects of bacteriology, immunology and virology. Through the studies on various microbes it is expected to understand host-parasite relationship and mechanisms of pathogenicity. Unlike the past, microbiology has rapidly been drawn to the center of the biological stage. Our laboratory mainly deals with viral oncogenesis and immunodeficiency in humans. Several projects are carried out with particular emphasis on investigation into the mechanisms of viral replication and pathogenesis induced by human retroviruses (HIV-1 and HTLV-I) and human herpes viruses. The purpose of many of the studies being undertaken is to identify critical events and molecules responsible for the efficient replication of these viruses, and in case of human retroviruses, those for transformation or destruction of normal lymphocytes. Virological, immunological and molecular approaches are being applied for this purpose.
(2) Research

The following studies have been extensively carried out in our laboratory with various biological and molecular biological techniques:
- Pathogenesis of HIV and HTLV (mutation, virulence, apoptosis, polymorphism).
- Studies on signal transduction pathways targeted by viral proteins.
- Molecular cloning by genetic approaches of components essential for virus replication in mammalian cells.

(3) Education

We are engaged in the lectures and practices on the basic aspects of infections for the 2nd year medical students and in the pre-clinical clerkship for the 4th year medical students. Students are also accepted in the Project Semester Program. Graduate course students carry out research on virology and oncology in the laboratory and join seminars and progress meetings.

(4) Lectures & Courses

Students can learn the structure, replication, function and genetics of micro-organisms as well as the host-pathogen interactions based on the front-line molecular and microbiological sciences.

(5) Publications

[Original Articles]

1. Yukichi Horiguchi, Tatsuro Goda, Akira Matsumoto, Hiroaki Takeuchi, Shoji Yamaoka, Yuji Miyahara. Direct and label-free influenza virus detection based on multisite binding to sialic acid receptors. Biosensors and Bioelectronics. 2017.02; 92; 234-240


[Conference Activities & Talks]

1. Momoe Itsumi, Kazuhiro Iwai, Shoji Yamaoka. Role for linear ubiquitination in the growth of HTLV-I-infected cells. 18th International Conference on Human Retrovirology : HTLV and Related Viruses 2017.03.07 Tokyo

2. Hiroaki Takeuchi. The timing and triggering of uncoating in an early stage of HIV-1 infection: the essential role of MELK for optimal capsid core disassembly. Special AMR seminar at St. Vincent’s Centre of Applied Medical Research 2017.09.27 Sydney, Australia

3. Hirona Ichikawa , Shoji Yamaoka , Shunichi Kajioka Momoe Itsumi. EPAC1 suppresses migration of bladder cancer cells. The 76th Annual Meeting of the Japanese Cancer Association 2017.09.28 Yokohama


Immunotherapeutics

Outline

Our research area is in between clinical and basic science, involving immunology, microbiology, and oncology. Persistent viral infection causes various diseases by inducing immunodeficiency, malignancy, autoimmunity, and inflammation. Human immunodeficiency virus (HIV) causes acquired immunodeficiency syndrome (AIDS), and Human T-cell leukemia virus type-I (HTLV-I) causes adult T-cell leukemia (ATL) and various chronic inflammatory autoimmune-like diseases. To understand mechanisms of these diseases, investigation on host immunity is indispensable. Immune responses are usually protective but sometimes harmful for the host, and are important determinants for disease manifestation. The goal of our research is elucidation of the role of host immunity in the diseases in order to develop effective immunotherapy. We also investigate intracellular mechanisms of viral replication to target direct molecules for therapy.

Research Subjects

1. Analysis of immunological risks for ATL development in HTLV-I-carriers.
2. Development of anti-tumor vaccine against ATL.
3. Immunological and molecular mechanism of HTLV-1-induced leukemogenesis.
4. Molecular mechanism of HIV replication especially related to HIV-1 integrase.
5. Experiments based on gene therapy to suppress HIV-1 replication.

Research

① Development and clinical study of anti-ATL vaccine therapy with Tax peptide-pulsed autologous dendritic cells.
Adult T-cell leukemia/lymphoma (ATL) is a human T-cell leukemia virus type-I (HTLV-I)-infected T-cell malignancy with poor prognosis. We developed a novel therapeutic vaccine designed to augment an HTLV-I Tax-specific cytotoxic T lymphocyte (CTL) response that has been implicated in anti-ATL effects, and conducted a pilot study to investigate its safety and efficacy in collaboration of Tokyo Medical and Dental University, National Kyushu Cancer Center, and Kyushu University. The vaccine consists of autologous dendritic cells pulsed with Tax peptides corresponding to the CTL epitopes. Two of three patients administered with the vaccine achieved partial and complete remission without severe side effects. The clinical outcomes of this pilot study indicate that the Tax peptide-pulsed DC vaccine is a safe and promising immunotherapy for ATL (Suehiro, Y., Hasegawa, A., et al. Brit J Haematol. 169: 356-367, 2015. doi: 10.1111/bjh.13302).

② Involvement of innate immune response in HTLV-1 pathogenesis.
The constitutive activation of NFκB plays an important role in leukemogenesis of adult T-cell leukemia/lymphoma...
Bio-Environmental Response

(ATL) caused by human T-cell leukemia virus type-1 (HTLV-1). Although HTLV-1 Tax is known to activate NFκB, ATL cells exhibit NFκB activities even in the absence of Tax expression, the mechanism of which has been a long-puzzling question. We demonstrate that both double-stranded RNA-dependent protein kinase (PKR) and anti-sense HTLV-1 transcripts are involved in the constitutive NFκB activation in Tax-negative ATL cells. Our findings elucidate a novel Tax-independent mechanism of NFκB activation underlying HTLV-1 leukemogenesis in which host antiviral responses are involved (Kinpara, S., et al. Leukemia, 29:1425-1444, 2015. doi: 10.1038/leu.2015.1).

(3) Education

① For undergraduate students of the medical school, we participate in education of basic immunology I, and II, the project semester, and the preclinical clerkship.

② Graduate students are trained for basic skills in the field of immunology and virology to handle biohazard materials. We provide the opportunity to research for mechanisms of the retro-virus-mediated diseases and development of immunological therapeutics. All the stuffs and students participate in maintenance of the laboratory and periodical seminars to discuss about their own studies and keep up with the latest knowledge and information in the area.

(4) Lectures & Courses

We always think of the clinical significance of the results of basic research. We try to find an effective therapy by approaching from basic research to understand the disease mechanisms and solve the problem. The disease mechanisms that we study include leukemogenesis, inflammation, immunosuppression, and autoimmunity in persistent virus infection. Through these studies, we contribute to clinical therapies as well as medical sciences.

(5) Clinical Services & Other Works

We developed an anti-ATL immunotherapy (Tax peptide-pulsed dendritic cell vaccine), which is under clinical studies in collaboration with National Kyushu Cancer Center and Kyushu University. We evaluate anti-tumor and anti-virus T-cell responses in HTLV-1-infected patients with or without various therapies including the immunotherapy and hematopoietic stem cell transplantation, in response to requests from clinical doctors.

(6) Publications

[Original Articles]


2. Tatsuro Takahata, Eri Takeda, Minoru Tobiume, Kenzo Tokumaga, Masaru Yokoyama, Yu-Lun Huang, Atsuhiko Hasegawa, Tatsu Hiota, Hironori Sato, Mari Kannagi, Takao Masuda. Critical Contribution of Tyr15 in the HIV-1 Integrase (IN) in Facilitating IN Assembly and Nonenzymatic Function through the IN Precursor Form with Reverse Transcriptase. Journal od Virology. 2017.01; 91(1);

3. Satomi Ando, Atsuhiko Hasegawa, Yuji Murakami, Na Zeng, Natsumo Takatsuka, Yasuhiro Maeda, Takao Masuda, Youko Suehiro, Mari Kannagi. HTLV-1 Tax-Specific CTL Epitope-Pulsed Dendritic Cell Therapy Reduces Proviral Load in Infected Rats with Immune Tolerance against Tax. J. Immunol.. 2017.02; 198(3); 1210-1219


8. Leila Sawada, Yoshiko Nagano, Atsuhiko Hasegawa, Hikari Kanai, Kai Nogami, Sayaka Ito, Tomoo Sato, Yoshihisa Yamano, Yuetsu Tanaka, Takao Masuda, Mari Kannagi. IL-10-mediated signals act as a switch for lymphoproliferation in Human T-cell leukemia virus type-1 infection by activating the STAT3 and IRF4 pathways. PLoS Pathog.. 2017.09; 13(9); e1006597

9. Leila Sawada, Yoshiko Nagano, Atsuhiko Hasegawa, Hikari Kanai, Kai Nogami, Sayaka Ito, Tomoo Sato, Yoshihisa Yamano, Yuetsu Tanaka, Takao Masuda, Mari Kannagi. IL-10-mediated signals act as a switch for lymphoproliferation in Human T-cell leukemia virus type-1 infection by activating the STAT3 and IRF4 pathways. PLoS Pathogens. 2017.09; 13(9); e1006597


[Conference Activities & Talks]

1. Sawada L, Nagano Y, Hasegawa A, Ito S, Sato T, Yamano Y, Tanaka Y, Masuda T, Kannagi M.. IL-10-mediated signals as a switch to proliferation in HTLV-1-infected T cells. 18th International Conference on Human Retrovirology HTLV-1 and related viruses 2017.03.10 Tokyo


5. Takao Masuda. Molecular basis for non-enzymatic role of HIV-1 Integrase. 2017.11.24 Tokyo

[Awards & Honors]

1. Quality Award in Basic Science, 18th International Conference on Human Retorovirology , 2017.03
Cellular and Environmental Biology

Associate Professor Masayuki HARA

(1) Research

Research Subjects
1) Reaction mechanisms of cellular protection systems against environmental oxidation stresses.
2) Modifying mechanisms in higher order structure of chromatin in cellular differentiation.
3) Shifting mechanisms in proteome profiles of cell organelle between pre and post conditions in environment, cell differentiation, disease, or drug exposure.

(2) Education

Living organisms were influenced their life by environment and adapted themselves to it, however, they formed environment and affected it. In other words, the species that cannot fit the changing environment were fallen and replaced by the new species which could adapt itself to. The organisms are as a part of the global environment, so it is thought that the individual structure and working of them are necessary environmental measures for their survival. It may be said that it is excessive suddenness of the change that human activity is environmentally-impacted now.

Main objective of cellular and environmental biology in the graduate course is to provide students opportunity to study the reaction and adaptation of the organisms for the environmental change at cellular level, to consider hazardous property, toxicity, or physiological activity of environmental (or man-made) factor, and to mention the biotechnical action to the environmental problems.

(3) Publications

[Conference Activities & Talks]

1. A. Noto, H. Yokota, K. Nomura, M. Hara. Measurement of dose distribution in the cell culture chamber used to evaluate cell damage in low dose exposure. 50th Annual Meeting of Japan Health Physics Society, 16th Annual Meeting of Japanese Society of Radiation Safety Management in Oita 2017.06.28

2. NOTO, Akio; AOSHIMA, Akihiro; MATSUSITA, Yoji; AOSHIMA, Keiichi; YOKOTA, Hiratsugu; NOMURA, Kiyoshi; HARA, Masayuki. A study about cleansing properties of various types of cleaners against radioactive-contamination materials for reconstruction 2. The 54th Annual Meeting on Radioisotopes and Radiation Researches 2017.07.05


Biodefense Research

Professor Toshiaki Ohteki
Junior Associate Professor (fm Jan.16) Taku Sato
Adjunct Lecturer Nobuyuki Onai
Assistant Professor (fm June.1st) Masashi Kanayama
Assistant Professor (to March.31) Yusuke Nakanishi
Junior Assistant Professor Jumpei Asano
Junior Assistant Professor Mihoko Kajita
Project Researcher Shunpike Kawamura
Research Fellow (SONY) Tomohiko Nakamura
Research Fellow (SONY) (fm Sept.1) Yasuharu Yamauchi
Graduate Student Minako Inazawa
Graduate Student Kana Minamide
Graduate Student Miwako Sase
Graduate Student Shuhei Imamura
Graduate Student Shun Ishikawa
Graduate Student Hirona Yamamoto
Graduate Student Yuta Izumi
Research Technician Shoko Kuroda
Research Technician Kisho Shiseki
Research Technician (fm April.1st) Minako Hanabusa
Secretarial Assistant Hisako Kamioka

(1) Outline

Our research projects focus on understanding the dynamic maintenance and transfiguration of homeostasis in the living body. Our goal is to define the homeostasis mechanism under conditions of health and disease. To accomplish this goal, we are trying to clarify the molecular basis of induction and failure of homeostasis by focusing on immune cells in particular mononuclear phagocytes (dendritic cells and macrophages), tissue stem cells, and their functional interplay in the immunological and non-immunological organs, such as skin and intestine. On the basis of our findings, we will further pursue our research in the hope of developing new rational therapies for prevention and treatment of disease.

(2) Research

1. Research on mononuclear phagocytes
   1) Discovery of a novel source of mononuclear phagocytes

      In 1968, Drs. Ralph van Fruth and Zanvil A. Cohn proposed a concept of mononuclear phagocytes that include monocytes and macrophages. In 1973, Dr. Ralph Steinman discovered dendritic cells (DCs), thereby redefining the mononuclear phagocytes as a population consisting of monocytes, macrophages and also DCs. It has been recently continuing epoch-making discoveries in the field of mononuclear phagocytes and their functions are now beyond classical Immunology and rather extend to broad life phenomenon, e.g. tissue development/regeneration, wound-healing, and establishment of various inflammatory diseases.

      DCs consist of conventional DCs (cDCs) and plasmacytoid DCs (pDCs), both of which play critical regulatory roles in the immune system. cDCs exhibit prominent antigen-presenting ability, whereas pDCs are characterized
by their capacity to produce large amounts of type I interferons (IFNs). We have discovered the DC progenitors in the mouse bone marrow, and named common DC progenitors (CDPs) (Immunity 2013; Nat Immunol 2007). Interestingly, CDPs are divided into 2 subpopulations. One is M-CSF receptor (R)+ CDPs mainly producing cDCs, and the other M-CSFR-CDPs producing a large number of pDCs. In addition to CDPs, common monocyte/macrophage progenitors, cMoP, identified in the mouse bone marrow and spleen by other group in 2013. Based on these achievements in mouse, we have been trying to identify human progenitors of mononuclear phagocytes, and most recently succeeded to identify human cMoP (in revision). Human cMoP gives rise to only monocytes but not other hematopoietic cells including DCs. Given that monocytes and monocyte-derived macrophages cause a variety of inflammatory disorders, including metabolic syndromes and tumor development, our studies shed light on possible therapeutic applications for infectious diseases, cancers and autoimmune diseases.

2) Roles of mononuclear phagocytes in inflammatory bowel disease

Breakdown of the intestinal epithelial layer’s barrier function results in the inflow of commensal flora and improper immune responses against the commensal flora, leading to inflammatory bowel disease (IBD) development. Using a mouse dextran sodium sulfate (DSS)–induced colitis model, we showed that commensal Gram-positive bacteria trigger the mobilization of inflammatory monocytes and macrophages into the colon (Mucosal Immunol 2015). TNF-α, a representative cytokine that aggravates colitis and a promising therapeutic target, was predominantly produced by monocytes/macrophages. Among macrophage subpopulations, Ly6c+ macrophages were a major colitogenic subset producing TNF-α. In addition, IFN-γ–Stat1 pathway was required for histone acetylation at the promoter regions of the Tnf loci in macrophages, indicating that IFN-γ–dependent epigenetic regulation instructs the development of colitogenic macrophages. Our study may provide new therapeutic targets, e.g. inhibition of acetyl transferase in macrophage, for treating IBD and colon cancer (in revision).

2. Research on tissue stem cells

1) Understanding of tissue homeostasis and its breakdown on the basis of immune cell-tissue stem cell interplay

We found that type I IFNs induce proliferation and exhaustion in hematopoietic stem cells (HSCs), and that interferon regulatory factor-2 (IRF2), a transcriptional suppressor of type I IFN signaling, preserves the self-renewal and multi-lineage differentiation capacity of HSCs (Nat Med 2009). Based on this finding, we show that type I IFN preconditioning, without irradiation or DNA alkylating agents, significantly enhanced the HSC engraftment efficiency in wild type (WT) recipient mice (Blood 2013). Based on these achievements, we have further found that physiological levels of type I IFN signaling also affect other tissue stem cells, e.g. intestinal stem cells (ISCs) and hair follicle stem cells (HFSCs). Elucidation of detailed mechanisms is currently in progress.

3. Collaborative research with other institutes

In collaboration with RIKEN, Institute of Physical and Chemical Research, we performed microbiota analysis by 16S rRNA sequencing, and found that there is no significant change in the feces of mice with excess IFN signals specifically in intestinal epithelial cells. As the mice showed defective regeneration capacity of ISCs, we concluded that it is unlikely due to the altered commensal composition (manuscript in preparation).

(3) Education

Immunology lectures in Faculty of Medicine, Masters Degree, and Doctoral Programs, Graduate School Seminar in other universities as a adjunct lecturer, and educational and research guidance for individual graduate students.

(4) Publications

[Original Articles]


Bio-Environmental Response


4. Nadya NA, Tezuka H, Ohteki T, Matsuda S, Azuma M, Nagai S. PI3K-Akt pathway enhances the differentiation of interleukin-27-induced type 1 regulatory T cells. Immunology. 2017.11; 152(3); 507-516

[Conference Activities & Talks]

[Awards & Honors]
1. Best Presentation Award, 2017.12
Pathological Cell Biology

Professor: Shigeomi SHIMIZU
Associate Professor: Norio SHIMIZU
Junior Associate Professor: Satoko ARAKAWA
Project Associate Professor: Masatsune TSUJIKA, Satoshi TORII
Assistant Professor: Shinya HONDA
Project Assistant Professor: Hirofumi YAMAGUCHI,
Michiko MUROHASHI, Nobuhiro FUJIKAKE, Hajime SAKURAI, Minkyon SHIN
Postdoctoral fellow (PD2): Go Yoshida
Secretary: Hitomi Fukabori, Setsu TAMAI
Research Assistant: Ikuyo YOSHINO, Ikuko NAKANOMYO, Naomi KOJIMA,
Hikari SHIMADA, Yuta YUNOMAE
Graduate Student: Yuna SUGIMOTO, Toyokazu SEKI, Tomoyo YOSHIDA, Saori NOGUCHI, Miyuki NAKAI,
Hatuki ENDO, Ryo OKUNO

(1) Outline

1) Analysis of apoptosis mechanism
2) Analysis of non-apoptotic cell death (autophagic cell death)
3) Physiological and pathological roles of cell death in mammals
4) Analysis of alternative macroautophagy mechanism
5) Physiological and pathological roles of autophagy in mammals
6) Development of novel EBV infection animal models using the hNOG mice
7) Development of an exhaustive pathogenic microbe screening system

(2) Research

Main objective in the graduate course is to provide students opportunity to study the molecular mechanisms of cell death and autophagy, the cell death-related diseases, the physiological and pathological roles of autophagy, and the development mechanism of Epstein-Barr virus (EBV) infection, the employment of immunodeficiency animals for the creation of virus research models and development of an exhaustive pathogenic microbial screening system.

(3) Education

Main objective in the graduate course is to provide students opportunity to study the molecular mechanisms of cell death and autophagy, the cell death-related diseases, the physiological and pathological roles of autophagy, and the development mechanism of Epstein-Barr virus (EBV) infection, the employment of immunodeficiency animals for the creation of virus research models and development of an exhaustive pathogenic microbial screening system.
(4) Publications

[Original Articles]


[Books etc]
1. shigeomi shimizu. cell death. 2017.12
2. Shimizu S. Autophagic Cell Death and Cancer Chemotherapeutics. . Springer,

[Misc]
2. shigeomi shimizu. Discovery of alternative autophagy 2017.01; 160(1); 7-36
3. shigeomi shimizu. Molecular mechanisms of mitophagy 2017.01; 260(1); 31-36
4. Shinya Honda, Shigeomi Shimizu. Autophagy controls centrosome number. Oncotarget. 2017.02; 8(9); 14277-14278
6. shigeomi shimizu. Discovery of alternative autophagy 2017.04; 68(4); 25-28
8. shigeomi shimizu. alternative autophagy eliminates mitochondria from reticulocytes 2017.06; 58(6); 649-653
10. Shigeomi Shimizu. Biological roles of alternative autophagy Molecules and Cells. 2017.10;

11. shigeomi shimizu. alternative autophagy eliminates mitochondria from reticulocytes 2017.10;


[Patents]

1. METHOD FOR DETECTING MYCOPLASMA, Announcement Number: 3192878
Pediatrics and Developmental Biology

Professor: Tomohiro MORIO
Associate Professor: Hirokazu KANEGANE
Assistant Professor: Kenichi KASHIMADA, Atsuko TAKI
Project Assistant Professor:
Eriko TANAKA, Masakatsu YANAGIMACHI, Chikako MORIOKA, Tomoko MIZUNO, Kei TAKASAWA, Yoshichika MAEDA, Kengo MORIYAMA, Mariko MOURI, Makito SAKURAI, Tsunanori SHIDEI, Toru KANAMORI

Graduate Students:
Toshiaki ONO, Tomonori SUZUKI, Risa NOMURA, Atsumi HOSOKAWA-TSUJI, Motoi YAMASHITA, Tsubasa OKANO, Ayako KASHIMADA, Chika KOBAYASHI, Akito SUTANI, Yohji YAMAGUCHI, Shintaro ONO, Yuko ISHI, Kei TANIDA, Eri KUMAKI, Mike SHIGENO, Lin LIN, YEH TZU WEN, Rina NISHI, Keisuke OKAMOTO, Ryuichi NAKAGAWA, Akira NISHIMURA, Satoshi MIYAMOTO

Department of Pediatrics, Neonatal and Maternal Medicine
Professor: Shozaburo DOI
Associate Professor: Kohsuke IMAI, Masatoshi TAKAGI

Department of LifeCourse Clinical Immunology
Professor: Masaaki MORI
Project Assistant Professor: Akihiro HOSHINO

(1) Outline

Our department is providing advanced medical service for infants, children, adolescents and young adults. The specialties cover most pediatric diseases, including hematology-oncology, immunology, cardiology, neurology, endocrinology, nephrology, neonatology, allergy and rheumatology. On the other hand, our scientific and academic activities encompass a wide spectrum, from basic to clinical research. By focusing on innovative strategies for clarifying pathogenesis, diagnostic tests, and therapeutic interventions, we are looking at comprehensive resolution of the child’s health problems, improving their future.

(2) Research

Our research covers many specialties of pediatric diseases, and the researches are based on from bench to bedside. Our current main projects are

1. Identification of responsible genes for primary immunodeficiency (PID).
2. Development of therapeutic approach for PID
3. Research in autoimmune lymphoproliferative syndrome (ALPS) and RAS-associated ALPS like syndrome
4. Quality assessment of iPS cells for clinical application
5. Regulation of granulocyte activation and apoptosis
6. Development of innovative techniques for ex vivo cell therapy after hematopoietic stem cell transplantation.
7. Elucidating the pathogenesis of glomerulosclerosis formation and identifying the precise function of podocytes.
8. Identifying the pathological mechanisms of compromised immune-function caused by refractory nephrotic syndrome
9. Clarifying the mechanisms of immunological pathology of pediatric idiopathic nephrotic syndrome.
10. Effect of dexmedetomidine on pulmonary hypertension
11. Role of Pannexin-1, a heart mechanosensor, in the right ventricular remodeling induced by pulmonary hypertension
12. Identifying the pathological mechanisms of periventricular leukomalacia and pulmonary damage using model rats
13. Elucidating the molecular mechanisms of gonadal development
14. Molecular pathology of congenital adrenal diseases and disorder of sex development
15. Molecular pathology of diabetes mellitus caused by mutations of the insulin receptor
16. Elucidating the role of ATM in cellular differentiation
17. Identifying pathological mechanisms of neurological diseases caused by defective DNA damage response
18. Investigation of molecule marker determine the prognosis of infant leukemia
19. Development of therapeutic strategy targeting homologous recombination repair
20. Genetic background of leukemia development
21. Genetic analysis and development of therapeutic approach for epilepsy syndrome
22. Developing data base of JIA (juvenile inflammatory arthritis), CoNinJa (Children’s version of National Database of Rheumatic Diseases by iR-net in Japan)
23. Clarifying immunological profiles of the patients with autoimmune diseases
24. Developing a methodology for the diagnosis of atypical Kawasaki Disease by exploiting a novel biomarker

We are collaborating with Medical Research Institute at TMDU, Tokyo University, Institute of Medical Science, Hiroshima University, Istitute Nazionale Tumori (Dr. D. Delia), University of Queensland (Prof. Peter Koopman), Erasmus University (Prof. Jacques van Dongen), Yonsei University (Profs. H. Kim, and SK Lee), Sony Life Science Laboratories, National Institute for Longevity Sciences, National Research Institute for Child Health and Development, RIKEN Center for Integrative Medical Science, Kazusa DNA Research Institute, Tokyo Metropolitan Institute for Medical Science, Juntendo University, and many other laboratories.

● Hematology/Oncology/Immunology Group (Basic Research)

Hematology/Oncology/Immunology group includes 9 staff members, 3 medical staff, 12 graduate students (including 1 graduate student of society), collaborating researchers, and several technical assistants.

Identifying the pathophysiology of primary immunodeficiency (PID)

We perform whole exome sequencing using the next generation sequencer to identify novel PID candidate genes, and identified novel PID responsible genes, IKZF1 (Ikaros) and TNFAIP 3 (A20) (Kanegane, Takagi). We also investigate the etiology of PAPA syndrome, PID associated lymphoma susceptibility, and alveolar proteinosis and PID with immunoglobulin class switch dysregulation (Morio, Kanegane and Imai). For RAS-related ALPS-like diseases, we established iPS cells in collaboration with a group of Associate Professor Otsu of the University of Tokyo Medical Research Institute and started drug screening for therapeutic drug development (Takagi).

In the clinical setting, viral infection is one of a critical factor that affect the outcome of hematopoietic stem cell transplantation. To overcome this disadvantage, we have been starting the generation of multi virus specific cytotoxic T cell. This research expand to virus specific T cell therapy for intractable viral infection as a clinical trial (Morio and Yanagimachi).

We are planning to introduce of neonatal masscreening for PID by using TREC / KREC tests (Imai).

Regenerative medicine

Dr. Morio organized research group to evaluate the quality of clinical use iPS cell. Comprehensive microbe monitoring system has been developing collaborate with Dr. Shimizu at TMDU Medical research institute, and non-invasive genomic alteration detection system has been developing collaborate with Dr. Inazawa at TMDU Medical research institute and Dr. Ohara at Kazusa genome institute.

Oncology

We are focusing on identifying the mechanisms that suppress oncogenic transformation by DNA damage response. In addition, development of therapeutics targeting DNA damage and repair pathway is conducted. Comprehensive genome research for leukemia has been conducted. These researches will be lead to identification of novel therapeutic approaches for pediatric leukemia and neuroblastoma. The research was expanded to Phase I clinical trial of Olaparib for refractory solid tumor.

● Cardiology Group

Pannexin-1 (PANX1) was identified as a mechano-sensor in remodeling of the left ventricle. By exploiting model
mice of pulmonary hypertension, we are investigating the role of PANX1 in right ventricle remodeling. This project is carried out by collaborating with Prof. Furukawa (Department of Bio-informational Pharmacology). Evaluating the effect of Dexmedetomidine for pulmonary hypertension is another ongoing project.

**Neurology Group**
Ataxia-telangiectasia (AT) is one of the major neurodegenerative diseases, and we established iPS cell lines from AT patients for elucidating the neuropathological mechanism. Further, we are exploring to discover unidentified genetic diseases with DNA repair-deficiency disorders using next-generation sequencing technology.

We aim to identify the pathological mechanisms of a disease associated with ER (Endoplasmic Reticulum) stress, Marinesco-Sjögren syndrome at the cellular level. We expect our research would provide therapeutic approach to the disease.

In collaborating with other research institutes, we have identified the adverse effect of BZDs on a mouse model of inflammation-induced status epilepticus. We showed that MDZ therapy significantly increased the risk for neurological sequelae in immature mice (collaboration with Haruo Okado, Tokyo Metropolitan Institute of Medical Science).

Elucidating immunological roles of the purinergic receptor signal for microglial inflammatory reaction is another target of our research. We have established P2RY12 KO microglial cell line that enabled us to investigate purinergic receptor signals on inflammatory cytokine production from microglia (collaborative project with Hiroshi Sakuma, Tokyo Metropolitan Institute of Medical Science).

**Endocrinology Group**
Molecular mechanisms of gonadal development
We are trying to elucidate the molecular mechanisms of gonadal development, especially, focusing on elucidating transcriptional network of gonadal development and gonadal cell differentiation. Our projects also include identifying the precise function of transcription factors, such as NR5A1 (SF1), FOXL2 and SOX9.

Elucidating the mechanisms of de-methylation during primordial germ cells differentiation
This project is carried out in collaboration with Prof. Ishino (XXXX).

Molecular analysis of pathological mechanisms in congenital adrenal hyperplasia (CAH)
Including the relationships between genotype and phenotype, we are trying to elucidate the pathological mechanisms of the disease.

Identifying novel molecules of congenital endocrinological diseases
Including insulin resistance, we are aiming to identify novel molecules that is responsible for congenital endocrinological diseases. Current ongoing projects will be integrated systematically, and will be applicable to develop innovative approach for the treatment of congenital endocrine disorder, including regenerative medicine.

**Nephrology Group**
Elucidating the pathological mechanisms of glomerulosclerosis and nephrotic syndrome
We carry out the project in collaborating with Division of Nephrology, Department of Internal Medicine, Juntendo University.

**Collagen/Rheumatoid disease group**
We are establishing an evidence based guideline of pediatric rheumatoid diseases including juvenile idiopathic arthritis: JIA. Developing a novel database system, CoNinJa (Children’s version of National Database of Rheumatic Diseases by iR-net in Japan), clarifying immunological profiles of the patients with autoimmune diseases, and developing a methodology for the diagnosis of atypical Kawasaki Disease by exploiting a novel biomarker are other our current projects.

**Neonatology group**
Using mesenchymal stem cells derived from umbilical cord blood cells, we are investigating a novel therapeutic approach for treating periventricular leukomalacia. We are exploiting a rat model of intrauterine infection, and the project is carried out in cooperation with the division of Cellular Physiological Chemistry and Nanomedicine (DNP) in TMDU.

**Allergy Group**
One of our main project goals is to elucidate the immunological mechanisms of food allergy such as that against milk and eggs.
In collaboration with the Japanese Society of Pediatric Allergy and Clinical Immunology, we are conducting several clinical studies to refine pharmacologic therapy listed in the Japanese pediatric guideline for the treatment and management of asthma.

(3) Education

Block Lecture
The lecture of clinical medicine are proposed systematic lectures with Pediatrics, Obstetrics and Gynecology as "Reproduction and Development Block". From this year, we introduced "active learning" at 9 lectures. Four fundamental education of medicine and odontology and 2 team based learning (TBL) were also provided.

Project semester
This provides the opportunities of basic research for the 4th grade students for a half years. This year, no student was committed to the research of our department.

Pre-clinical clerkship (PCC).
We proposed 6 programs providing the opportunities to learn the logical skills of clinical practice.
After the curriculum, The students undertake the examination of clinical practice, i.e., OSCE , CBT.

Clinical clerkship (CC)
The practical training of medicine, and every month, approximately 10 students have the training in our department. The students involved in each group of subspecialty (Hematology, Oncology, Immunology, Cardiology, Neurology, Nephrology, Rheumatology, Endocrinology, Neonatology). In addition to our university hospital, the students visit the satellite hospitals for the training of common diseases.
Once a week, the students round the pediatric ward of the hospital with the professor to learn the physical examination skills.

Training of junior clinical fellows
We provide clinical training courses in cooperation with satellite hospitals (Musashino Red Cross Hospital, Soka Municipal Hospital or North Tokyo Medical Center). Depending on the individuals, they could select the advanced training at the pediatric ward in The University Hospital for two to eight months.

(4) Lectures & Courses

Primary care of pediatrics covers wide spectrum of health care and clinical problems in children, and all pediatricians should be well trained in those subjects. Further, Medical and Dental University is one of the top ranked national medical university in Japan, and achieving cutting edge research is another social responsibility. For students, we provide educational programs to learn primary pediatric care, management of the diseases in every organ during neonatal period childhood, and basic science. For residents, our educational program is mainly focused on producing physician scientists who possess the skills of pediatrician for primary care, of physician specialist and of basic researcher.

(5) Clinical Services & Other Works

Hematology/Oncology/Immunology Group
Treating children with primary immunodeficiency, hematological malignancies, hematological disorders, and malignant solid tumors.
Collaboration with other professional facilities including St. Luke’s International Hospital and Juntendo University Hospital. Joint clinical conference and trainee exchange program are regularly held in the collaborating system.

Medical care
By collaborating with national co-operative clinical research group, such as the Tokyo Children’s Cancer Study Group (TCCSG) and Japanese Children’s Cancer Study Group (JCCG), we offer our patients opportunities to participate in the latest clinical trials, contributing to establishment of both standard and novel therapies for childhood cancers and other non-malignant diseases.
In 2017, we performed HCT for 13, and 10 cases were for PID patients. Our experience of HCT exceeds 193
cases including more than 92 cases with primary immunodeficiency diseases, so far.

Clinical trials
Three doctor-initiated clinical trials led by pediatric department of Tokyo Medical and Dental University are on going.

'Phase I Clinical Study of Oral Olaparib in Pediatric Patients with Refractory Solid Tumors '.
' Multi-virus (Cytomegalovirus, EB virus, Adenovirus, BK virus, and HHV-6) specific Cytotoxic T-Lymphocytes from HLA-haploidentical or more HLA-matched relative donor to persistent viral infection after hematopoietic cell transplantation (multi-center, prospective phase I/II study) '.
' Clinical Phase II Study of hematopoietic stem cell transplantation for ataxia telangiectasia and related diseases ' is carried out.

● Cardiology Group
We provide medical care in a wide range of pediatric cardiovascular diseases. Especially, our department is one of the major hospitals providing medical care of pediatric pulmonary hypertension.
In 2017, the number of inpatients was 127 (CHD: 57, acquired heart diseases:14, cardiac arrhythmias: 14, Kawasaki diseases (KD): 21)
Cardiac catheterizations were performed in 64 patients
Cardiac surgery was performed in 13 CHD patients (8 VSDs, 4 ASDs, 1 cTGA, 1 PAPVR, and one PDA)

● Neurology Group
We provide medical care in a wide range of pediatric neurologic diseases.
In particular, collaborating with the department of neurosurgery, we run an epilepsy center, providing advanced medical care for pediatric patients with intractable epilepsy.
The medical services in our department are long-term video EEG monitoring, high magnetic field MRI/PET, ACTH therapy, ketogenic diet, vagus nerve stimulation and surgical operation, such as focal brain resection and callosotomy.

● Endocrinology Group
We provide highly specific diagnostic approach and therapy in a wide range of pediatric endocrine disorders. Among many pediatric endocrine disorders, we are directing our effort at the disorders of adrenal gland and sex development (DSD), and diabetes mellitus. We are looking at establishing the clinical center for those patients with pediatric-urologist and other co-medical staffs.

● Nephrology Group
Nephrology Group provides diagnosis and treatment for patients with various kidney diseases. We perform kidney biopsy (30/year) and imaging examination.
We performed peritoneal dialysis for low-body-weight children and provided acute hemodialysis for children who developed acute kidney injury and for children with collagen diseases.

● Neonatology group
Our institute is registered on a board of Perinatal Cooperation Hospital in Tokyo running a transferring system of newborns who require neonatal care. Currently we accept newborn patients from the whole area in Tokyo, contributing the emergency network system for neonatal care in Tokyo.
We are treating low birth weight (> 1500g) and premature (> 28w) neonates.

● Allergy Group
The qualified allergists of the group attend both inpatient and outpatient care units for allergic diseases in affiliated hospitals of our university, where not only the standard medical services following clinical guidelines for allergic diseases are provided, but also highly advanced treatment such as oral immunotherapy for food allergy as well.

( 6 ) Clinical Performances

● Hematology-Oncology/ Immunology Group
Hematology-Oncology/ Immunology Group provides diagnosis, treatment and pathological analysis of hematological malignancies and primary immunodeficiency diseases. We perform hematopoietic stem cell transplan-
tation for refractory diseases. Especially, we treat the largest number of primary immunodeficiency disease patients in Japan. We participate in multi-center cooperative clinical research to establish both standard and novel therapies for childhood cancers, and also participate in industry-based clinical trials for drug, such as anticancer drug, approval.

● Cardiology Group
Cardiology group perform diagnosis, evaluation of treatment or decision of treatment strategy for PH patients. We positively treat by up-front combination therapy (uCT) with three kinds of disease targeted drugs and continuous venous infusion of epoprostenol. Worthy of special mention, surgical operation in children with congenital heart diseases was restarted after about 30 years blank.

● Neurology Group
Neurology group provide highly specialized diagnostic approach and medical care for neurological disorders such as intractable epilepsy, cerebellar ataxia, involuntary movement, immune-mediated neurological disease, perinatal brain damage, infection of nervous system, acute encephalopathy/encephalitis, neurodegenerative disease and neuromuscular disorder.

● Endocrinology Group
The leader of our endocrinology group is a supervisor of congenital adrenal hyperplasia (CAH) newborn screening in Tokyo. We treat many CAH (21-OHD) patients and performed couple of clinical studies. We also focus on disorder of sex development (DSD) and long-term follow-up for childhood cancer survivors (CSS). We are managing a Type 1 DM patients’ association (Wakamatsu-kai) and organize the summer camp every year.

● Nephrology Group
We treat various pediatric kidney diseases, such as congenital nephrotic syndrome, refractory nephrotic syndrome, IgA nephropathy, etc. Kidney biopsy is performed to more than 40 patients. We provide acute hemodialysis treatment and peritoneal dialysis for low-body-weight patients (under 10kg) in cooperation with department of blood purification.

● Collagen/Rheumatoid disease group
Clinically, our target is not only pediatric collagen and rheumatic disease, but also inflammatory diseases which require biopharmaceutical medicine, such as periodic fever unknown origin, and repeated arthritis affecting multiple joints. Further, for developing a therapeutic approach, we are planning to register international clinical trials of a novel biopharmaceutical medicine, such as belimumab for pediatric SLE.

● Neonatology Group
Our NICU (Neonatal Intensive Care Unit) provides intensive care for preterm infants and critically ill newborns. As a designated Perinatal Cooperation Hospital in Tokyo, we accept newborn patients from various areas in Tokyo by collaborating with comprehensive reproductive medicine.

● Allergy Group
We focus on clinical care of severe and complicated allergic diseases such as food allergy-induced anaphylaxis, food-dependent exercise-induced anaphylaxis, food protein-induced enterocolitis syndrome and oral allergy syndrome induced by cross-reactivity between food, inhalant and contact allergens. We extensively perform food challenge tests not only for correct diagnosis of food allergy but for preparation of oral immunotherapy in cooperation with the affiliated hospitals.

(7) Publications

[Original Articles]


15. Shimpei Baba, Yuji Sugawara, Kengo Moriyama, Motoki Inaji, Taketoshi Maehara, Toshiyuki Yamamoto, Tomohiro Morio. Amelioration of intractable epilepsy by adjunct vagus nerve stimulation therapy in a girl with a CDKL5 mutation. Brain Dev. 2017.04; 39(4); 341-344


19. Haruna Yokoyama, Shimpei Baba, Jun Oyama, Kengo Moriyama, Tomohiro Morio. Early hypoperfusion on arterial spin labeling may be a diagnostic marker for acute encephalopathy with biphasic seizures and late reduced diffusion. Brain Dev.. 2017.05; 39(8); 722

20. Masatoshi Takagi, Yasuyoshi Ishiwata, Yuki Aoki, Satoshi Miyamoto, Akihiro Hoshino, Kazuaki Matsumoto, Akira Nishimura, Mari Tanaka, Masakatsu Yangimachi, Noriko Mitsuuki, Kohsuke Imai, Hirokazu Kanegane, Michiko Kajiwara, Kazuko Takikawa, Tsukasa Mae, Osamu Tomita, Junya Fujimura, Masato Yasuhara, Daisuke Tomizawa, Shuki Mizutani, Tomohiro Morio. HLA haploidentical hematopoietic cell transplantation using clofarabine and busulfan for refractory pediatric hematological malignancy. Int J Hematol. 2017.05; 105(5); 686-691


24. Masatoshi Takagi, Shohei Ogata, Hiroo Ueno, Kenichi Yoshida, Tzuwen Yeh, Akihiro Hoshino, Jinhua Piao, Motoy Yamashita, Mai Nanya, Tsubasa Okano, Michiko Kajiwara, Hirokazu Kanegane, Hideki Muramatsu, Yusuke Okuno, Yuichi Shiraishi, Kenichi Chiba, Hiroko Tanaka, Yuki Bando, Motohiro
Kato, Yasuhide Hayashi, Satoru Miyano, Kohsuke Imai, Seishi Ogawa, Seiji Kojima, Tomohiro Morio. Haploinsufficiency of TNFAIP3 (A20) by germline mutation is involved in autoimmune lymphoproliferative syndrome. J. Allergy Clin. Immunol.. 2017; 139(6); 1914-1922


27. Ayumi Kobayashi, Reiko Takasawa, Kei Takasawa, Masato Nishioka, Masahide Kaneko, Hiroshi Ono, Takanobu Maekawa, Tomohiro Morio, Masayuki Shimohira. An infant case of severe hyperesinophilia and systemic symptoms with multiple drug hypersensitivity and reactivation of cytomegalovirus and BK virus. Allergol Int. 2017; 66(3); 479-481


31. Taizo Wada, Satoshi Miyamoto, Hiroyuki Okamoto, Yusuke Matsuda, Tomoko Toma, Kohsuke Imai, Masatoshi Takagi, Tomohiro Morio, Akihiro Yasue. Prolonged neutropenia due to antihuman neutrophil antigen 2 (CD177) antibody after bone marrow transplantation Pediatr Blood Cancer. 2017; 64(7); 1401-1402


34. Hirokazu Kanegane, Akihiro Hoshino, Tsubasa Okano, Takahiro Yasumi, Taizo Wada, Hidetoshi Takada, Satoshi Okada, Motoi Yamashita, Tzu-Wen Yeh, Ryuta Nishikomori, Masatoshi Takagi, Kohsuke Imai, Hans D Ochs, Tomohiro Morio. Flow cytometry-based diagnosis of primary immunodeficiency diseases Allergol Int. 2017; 107(7); 413-414

35. Nishioka M,Takahashi A,Komiya E,Yamaguchi Y,Maeda Y,Doi S. A Case of Anomalous Left Anterior Descending Coronary Artery from the Pulmonary Artery Combined with Anomalous Right Coronary Artery from the Left Coronary Sinus Pediatric Cardiology and Cardiac Surgery. 2017; 4(33); 341-342
36. Johanna Schepp, Janet Chou, Andrea Skrabl-Baumgartner, Peter D Arkwright, Karin R Engelhardt, Sophie Hambleton, Tomohiro Morio, Ekkehard Röther, Klaus Warnatz, Raif Geha, Bodo Grimbacher. 14 Years after Discovery: Clinical Follow-up on 15 Patients with Inducible Co-Stimulator Deficiency. Front Immunol. 2017.08; 8; 964

37. Maki Gau, Kei Takasawa. Initial patient choice of a growth hormone device improves child and adolescent adherence to and therapeutic effects of growth hormone replacement therapy. J. Pediatr. Endocrinol. Metab.. 2017.08; 30(9); 989-993


42. Akira Endo, Miko Okamura, Shunsuke Yoshikawa, Yasuhiro Otomo, Tomohiro Morio. Multilateral Functional Alterations of Human Neutrophils in Sepsis: From the Point of Diagnosis to the Seventh Day. Shock. 2017.10;

43. Tsubasa Okano, Takuro Nishikawa, Eri Watanabe, Takashi Watanabe, Takehiro Takashima, Tzu-Wen Yeh, Motoi Yamashita, Mari Tanaka-Kubota, Satoshi Miyamoto, Noriko Mitsuki, Masatoshi Takagi, Yoshifumi Kawanokyo, Yoshiki Ichihara, Masahiro Mochizuki, Kolsuke Imai, Hirokazu Kanegane, Tomohiro Morio. Maternal T and B cell engraftment in two cases of X-linked severe combined immunodeficiency with IgG1 gammopathy. Clin Immunol. 2017.10;


61. Masayuki Nagasawa, Noriko Mitsuki, Yuki Aoki, Toshiaki Ono, Takeshi Isoda, Kohsuke Imai, Masatoshi Takagi, Michiko Kajiwara, Hirokazu Kanegane, Tomohiro Morio. Effect of reduced-intensity conditioning and the risk of late-onset non-infectious pulmonary complications in pediatric patients Eur. J. Haematol. 2017.12; 99(6); 525-531


[Books etc]

[Misc]
1. Katsuhiko Asanuma, Juan Alejandro Oliva Trejo, Eriko Tanaka. The role of Notch signaling in kidney podocytes. Clin. Exp. Nephrol.. 2017.02; 21(1); 1-6


3. Masatoshi Takagi. DNA damage response and hematological malignancy. Int J Hematol. 2017.04; 106(3); 450-453

4. Tomohiro Morio. Recent advances in the study of immunodeficiency and DNA damage response. Int. J. Hematol. 2017.10;

5. Risa Nomura, Kentaro Miyai, Gen Nishimura, Kenichi Kashimada, Tomohiro Morio. Myhre syndrome: Age-dependent progressive phenotype Pediatr Int. 2017.11; 59(11); 1205-1206

[Conference Activities & Talks]
1. Takasawa K, Tsuji A, Nomura R, Miyakawa Y, Numakura C, Kashimada K, Morio T. Molecular mechanism of insulin resistance: two cases of insulin receptoropathy. The 120th Annual Meeting of the JPS 2017.02.01 Tokyo

2. Masatoshi Takagi, Junko Takita. Loss of ATM and DNA damage response associated genes in neuroblastoma provides a therapeutic target for PARP inhibitor. Ataxia telangiectasia work shop (ATW 2017) 2017.03.20 Milan, Italy
3. Comprehensive target sequence enabled the diagnosis of PGK deficiency. The 120th Annual Meeting of the Japan Pediatric Society 2017.04.14

4. Cell and Gene Therapy for Hematological Disorders. The 8th JSJ International Symposium 2017 2017.05.01 Miyazaki, Japan

5. Masatoshi Takagi. Primary immunodeficiency and leukemia/lymphoma. 28th Annual Meeting of the International BFM-Study Group 2017.05.10 Jerusalem, Israel

6. Kuniko Kohyama, Ayuko Igarashi, Tomonori Suzuki, Taiki Shima, Hiroshi Sakuma.. The rapid and quantitative anti-MOG autoantibody assay using flow cytometry.. 14th Asian and Oceanian Congress of Child Neurology 2017.05.11 Fukuoka, Japan

7. Tomonori Suzuki, Kuniko Kohyama, Masaharu Hayashi, Hiroshi Sakuma.. Clinical features and cerebrospinal fluid cytokine/chemokine profiles of anti-NMDAR encephalitis in children.. 14th Asian and Oceanian Congress of Child Neurology 2017.05.11 Fukuoka, Japan

8. Yuji Sugawara, Hisako Ishiwata, Ayako Kashimada, Koji Takahashi, Kei Murayama, Mitsuhiro Kato, Hirotomo Saito, Mitsuko Nakashima, Naomichi Matsumoto, Tomohiro Morio,. MRI findings in infantile fulminant SSADH deficiency. . 14th Asian and Oceanian Congress of Child Neurology 2017.05.11 Fukuoka, Japan

9. Kenji Kubara, Kazuto Yamazaki, Yasuharu Ishihara, Haruna Takagi, Masashi Ito, Kappei Tsukahara, Masatoshi Takagi, Makoto Otsu. Mutant iPS cells derived from patients with RALD show significance of KRAS for self-renewal and differentiation propensity. International society for stem cell research, 2017 annual meeting 2017.06.14 Boston, USA


11. Doi S. Prostacyclin Treatment. World Congress of Pediatric Cardiology and Cardiac Surgery 2017.07.17 Barcelona Spain

12. Doi S. Evaluation of the child with PAH. World Congress of Pediatric Cardiology & Cardiac Surgery 2017 2017.07.17 Barcelona Spain


22. Morio T. Investigational Gene Analysis for Primary Immunodeficiency Diseases. Asia Pacific Society for Immunodeficiencies(APSID) 2017.10.10 Hong Kong

23. Morio T. Hematopoietic Cell Transplantation for Primary Immunodeficiency Diseases.: Current Situation and Future Direction. Asia Pacific Society for Immunodeficiencies(APSID) 2017.10.10 Hong Kong

24. Imai.k. Newborn Screening of PID in japan. APSID 2017 Autumn School 2017.10.10 Hong Kong


26. Eriko Tanaka,Miyuki Takagi. Toll-like receptor 8 and 10 are possibly associated with pathogenic mechanisms of idiopathic nephrotic syndrome. Kidney Week 2017 2017.11.02 New Orleans, LA, USA

27. Central venous catheter-related cylindrical thrombosis in right atrium after bone marrow transplantation for X-linked anhidrotic ectodermal dysplasia with immunodeficiency(XL-EDA-ID). 2017.11.09


29. A case of T-cell lymphoblastic lymphoma/leukemia complicated by gait inability during combination chemotherapy with nelarabine. 2017.11.10

30. A case of CTLA4 haploinsufficiency found by lymphadenopathy. 2017.11.11

31. A 7-year-old girl who maintain complete remission after multiple hematopoietic cell transplantation for frequent relapse of infant leukemia. 2017.11.11

32. Efficacy of PARP-inhibitor for Chronic Myeloid Leukemia. 2017.11.11


Rheumatology

Following studies have been extensively carried out in our laboratory with various biochemical, immunological, molecular biological and statistical techniques:

1) Investigation of mechanism and development of new therapeutics for the treatment of rheumatoid arthritis and dermatomyositis.

2) Establishment of evidence-based treatment of rheumatic diseases by implementing several cohort studies. We collaborate with department of lifetime clinical immunology and pediatrics.

(2) Education

We have provided medical students and graduates with the opportunity to obtain the ability to identify important clinical problems and to solve them by clinical reasoning through their active participation into the diagnosis and management of various rheumatic diseases.
(3) Clinical Services & Other Works

We have provided care to many patients with diverse rheumatic diseases. We have aimed to practice evidence-based medicine and to provide care that is in accordance with the global standard. We have contributed to the development of potential new drugs and treatments through participation into industry- as well as investigator-initiated clinical trials for chemical and biological agents. We have also contributed to the refinement of the care of rheumatic disease patients through the conduct of various pharmacovigilance studies.

We cooperate with department of lifetime clinical immunology and pediatrics.

(4) Publications

[Original Articles]


4. Nguyen HN, Noss EH, Mizoguchi F, Huppertz C, Wei KS, Watts GF, Brenner MB. Autocrine Loop Involving IL-6 Family Member LIF, LIF Receptor, and STAT4 Drives Sustained Fibroblast Production of Inflammatory Mediators Immunity. 2017.02; 46(2); 220-232

5. Henderson Lauren, Rao Deepak, Teslovich Nikola, King Sandra, Mizoguchi Fumitaka, Ameri Sarah, Morris Allyn, Elco Christopher, Chang Margaret, Levescot Anaïs, Lederer James, Martin Scott, Simmons Barry, Wright John, Brenner Michael, Raychaudhuri Soumya, Fuhlbrigge Robert, Nigrovic Peter. 3-D Explant Method Facilitates the Study of Lymphocytes in Synovium and Reveals a Population of Resident Memory-Like T Cells in Rheumatoid Arthritis ARTHRITIS & RHEUMATOLOGY. 2017.04; 69; 197-199


structural outcomes in a real-world clinical setting under a treat-to-target strategy. Mod Rheumatol. 2017.09; 27(5); 811-819


18. Komiya Yoji, Saito Tetsuya, Mizoguchi Fumitaka, Kohsaka Hitoshi. Hemophagocytic Syndrome Complicated with Dermatomyositis Controlled Successfully with Infliximab and Conventional Therapies. Internal Medicine. 2017.12; 56(23); 3237-3241
19. Eri Kato, Tetsuji Sawada, Koichiro Tahara, Haeru Hayashi, Mayu Tago, Hiroaki Mori, Jinju Nishino, Toshihiro Matsui, Shigeto Tohma. The age at onset of rheumatoid arthritis is increasing in Japan: a nationwide database study

[Misc]

1. CD4+ and CD8+ CD28null T cells are cytotoxic to autologous muscle cells in patients with polymyositis RHEUMATOLOGY. 2017.07; 58(1); 109-116

[Conference Activities & Talks]

1. Hitoshi Kohsaka, Natsuka Umezawa, Kimito Kawahata, Naoki Kimura, Yoko Yoshiihashi-Nakazato. IL-23 as a therapeutic target of inflammatory myopathy. 2nd Global Conference on Myositis 2017.05.05 Potomac

2. Hirokazu Sasaki, Akito Takamura, Kimito Kawahata, Hitoshi Kohsaka. Peripheral lymphocyte subset repertoires reflect clinical features of polymyositis and dermomyositis. 2nd Global Conference on Myositis 2017.05.05 Promac

3. Natsuka Umezawa, Kimito Kawahata, Naoki Kimura, Yoko Yoshiihashi-Nakazato, Hitoshi Kohsaka. Interleukin-23 as a therapeutic target for inflammatory myopathy.. 7th East Asian Group of Rheumatology 2017.06.07 Tokyo


11. Hitoshi Kohsaka. Treatment consensus of polymyositis and dermatomyositis in Japan. IMACS and JDM Working Group Annual Meeting 2017.11.05
Dermatology

Professor: Hiroo YOKOZEKI
Associate Professor: Takeshi NAMIKI
Junior Associate Professor: Tsukasa UGAJIN, Makiko NISHIDA
Project Junior Associate Professor: Kaoru TAKAYAMA
Assistant Professor: Shown TOKORO, Takashi HASHIMOTO, Minako INAZAWA, Yuki OHTSUKI
Senior Resident: Shinji OGAWA, Keiko INUI, Michiko NAKAMURA, Miho SHIMOKATA
Resident: Takuya WAKASA, Yutaro IWAMOTO
Doctoral Student: Rie YU, Sayaka KIKUCHI, Minako INAZAWA, Aiko FURUI, Kohei NOJIMA, Kohei KATO, Sally ESHIBA, Rumi SUZUKI, Takahiro ISHIKAWA, Al-Busani Hind Abdullah Ahmed, Yutaro HANDA, Hazuki IIJIMA
Technical Assistant: Chiyako MIYAGISHI, Ayumi FUJIKAWA
Staff Assistant: Masae SAKATA, Mayuko HAYASHI, Yu KAWAMURA

(1) Outline

Dermatology is a department of medical science which educates students to make a diagnosis and treatment for skin diseases. Main objective of Dermatology in the graduate course is to provide students opportunity to study advanced Immunodermatology, physiology, pathology and allergology, and also to study making diagnosis of skin diseases and operation techniques. Students are also taught on skin oncology (melanoma, angiosarcoma) and its related laboratory technology depending on their research project.

(2) Research

1) Mechanisms of contact hypersensitivity
2) Pathological etiology of atopic dermatitis
3) Mechanisms of eosinophil recruitment to the skin
4) Roles of basophils in human skin diseases
5) Functional roles of PGD2 and its receptors in allergic inflammation
6) Therapeutic approach for skin diseases by stable form of galectin-9
7) Analysis of pathological mechanisms of hyperhidrosis
8) Investigation of mediators for itch
9) Pathological etiology of chronic prurigo
10) Therapeutic approach for angiosarcoma with HVJ-E.
11) To establish the in vitro diseases model of dermatological disorders using human induced pluripotent stem cell
12) Murine food allergy model with transcutaneous sensitization

(3) Clinical Performances

Dermatology clinic provides an advanced treatment for skin diseases; skin tumors, infectious diseases, skin allergy, collagen diseases and psoriasis. Recently, we established the gene theories (STAT6 decoy ODN) for
severe atopic dermatitis in the clinic.

(4) Publications

[Original Articles]


[Conference Activities & Talks]

1. Takashi Hashimoto, Takahiro Satoh, and Hiroo Yokozeki. Basophils release amphiregulin and may contribute to murine models of prurigo reaction and MC903-induced atopic dermatitis-like skin inflammation.. 2017 Society for Investigative Dermatology Annual meeting 2017.04.26 Oregon


3. Ugajin T, Shibama S, Yamaguchi T, Yokozeki H. Bilirubin oxidation is associated with the disease severity of atopologic dermatitis in adults.. 47th Annual Meeting of the European Society for Dermatologic Research 2017.09.27 SALZBURG

4. Inui K, Inazawa M, Nishida M, Namiki T, Yokozeki H. A case of diffuse alopecia areata mimicking female pattern hair loss.. 10th World Congress for Hair Research 2017.11.02 KYOTO

NCC Cancer Science

Visiting Professor  Hirofumi ARAKAWA
Visiting Professor  Kenkichi MASUTOMI
Visiting Professor  Ryuji HAMAMOTO
Visiting Associate Professor  Masahiro YASUNAGA
Visiting Associate Professor  Satoshi FUJII
Visiting Lecturer  Tohru KIYONO
Visiting Lecturer  Kazunori AOKI
Visiting Lecturer  Koji OKAMOTO
Visiting Lecturer  Takashi KOHNO
Visiting Lecturer  Michihiro MUTOH
Graduate Students   D3  Kasumi OTSUBO,
                          Yuki YAMAMOTO
                          D1  Tomoko WATANABE
                          M2  Marina HENMI,
                              Hidenobu SUZUKI,
                              Taichi IIJIMA
                          M1  Yamato OGIWARA,
                              Maiko TAKAHASHI,
                              Naoki TSUKIMATA,
                              Miyu YOSHIDA

(1) Research

1. Carcinogenesis and molecular mechanism
2. Functions of cancer-associated genes and their alterations
3. Genomic, epigenomic and proteomic analysis of cancer and personalized medicine
4. Tumor microenvironment
5. Cancer stem cells/non-coding RNA/signaling pathway
6. Molecular target/drug delivery/diagnosis and therapy

(2) Education

To learn knowledge and skill for cancer research, students attend lectures and seminars, and attend and/or practice research meeting, journal club, scientific meeting, etc. These practices will enable students to develop an ability to conduct their studies as an

Bio-Environmental Response
independent cancer researcher in the future. To obtain good skills to carry out experiments that are required for cancer research, students belong to one of our research groups, and conduct their own studies under the guidance of the instructor and/or staff. Students perform various experiments involved in genetics, gene technology, biochemistry, cellular biology, molecular biology, physiology, experimental animal, pathology, genomic/epigenomic/proteomic analysis, imaging, next generation sequencing, etc.

(3) Publications

[Original Articles]


11. Nagasato M, Rin Y, Yamamoto Y, Henmi M, Hiraoka N, Chiwaki F, Matsusaki


[Reviews Articles]


[Conference Activities & Talks]


Human Pathology

Professor: Yoshinobu EISHI
Assistant Professor: Daisuke KOBAYASHI,Takashi ITO,Mariko NEGI
Laboratory Technician: Asuka FURUKAWA
Technical Assistant: Yuki ISHIGE
Graduate Students:
(Doctor Program) Yoshimi SUZUKI,Katsumi OISHI,Akira TAKEMOTO,
Tomohisa OGAWA,Tomohito AYABE,Nobuyasu AWANO,
Tomoya KAKEGAWA,Yuji SEKINE,Kurara YAMAMOTO,
Masahiro YAMAMOTO
(MD-PhD course) Yuriko WADA
(Master’s Program) Madoka Yoshizaki
Research Student: Yuka HIROTA
Secretary: Miho IWAMITSU,Mayako TOKUNAGA

(1) Outline
Pathology in a medical department used to be the general study field about human disease. Later, Microbiology and Parasitology had been separated from the field of Pathology. Lately, interdisciplinary of traditional study field had been advanced and new specific academic disciplines are developed. Pathology is currently under the same trend. Basic divisions such as Experimental and Cell Biological pathology are becoming independent from the clinicopathological field. Thus, Human Pathology has become the main category of pathology.

The principles of Human Pathology are to educate clinical pathologists with accurate pathological diagnosis skills of human disease, to research theses that are directly related to human disease, and to educate pathological researchers with ability to perform such research.

(2) Research
1) Endogenous infection (diseases caused by indigenous microorganisms in susceptible hosts)
2) Cancer research (histopathology, carcinogenesis, prognostic factors, and so on)

(3) Education
In the course, they usually spend the first two years for anatomical pathology training, searching for their own research theme and another two years for researches and thesis-writing.

(4) Lectures & Courses
Department of Human Pathology provides a graduate course for future pathologists to train the skills and knowledge of anatomical pathology and develop the abilities for medical researches. Graduate students are
Systemic Organ Regulation

educated to associate their researches with problems in diagnosis and treatment of diseases and etiologies of the
diseases of unknown causes.

(5) Clinical Performances

After the Meiji Era, the department of Human Pathology in medical faculty belonged under the basic medical
sciences; however, Pathology in the existing hospitals is essentially the clinical medicine. Diagnosis of patients
in each clinical department is done by taking the biopsy of diseased tissues or collecting the cell samples by
either endoscope or surgery. Then, the lesions are analyzed with the microscope, and pathological diagnosis
is reported to the clinical departments. The samples of organs and tissues taken from the surgery are used to
study the spread of the lesion and its characteristics, and also to examine the adequacy of surgery. It is also
used to determine future treatment policy. During the course of patients’ treatments, sample tissues are taken
periodically and are analyzed pathologically to see therapeutic effect. If a patient has unfortunately joined the
majority, morbid anatomy is done by the pathologists along with the patient’s attending physician. They
study the resulting effects of laboratory findings and choice of treatment, and improve the future diagnosis and
treatments. The department of Human Pathology and Surgical Pathology technically work as one although
they are separated in this university’s organizational structure. Human Pathology does not directly work with
the patients; however, it is involved directly with the diagnosis as well as the treatments. Strong cooperation
between clinicians and pathologists is essential for the best practice, and is required for the university hospital
as an “advanced treatment hospital.” Therefore, doctors of Human Pathology study, research and practice
pathology to be the great pathologists so-called the “doctor of doctors.”

(6) Publications

[Original Articles]

1. Takahiro Ogishima, Kaoru Tamura, Daisuke Kobayashi, Motoki Inaji, Shihori Hayashi, Reina Tamura,
   Tadashi Nariai, Kenji Ishii, Taketoshi Maehara. ATRX status correlates with 11 C-methionine uptake in
   WHO grade II and III gliomas with IDH1 mutations. Brain Tumor Pathol. 2017.01; 34(1); 20-27

2. Toshiyuki Yamamoto, Akiko Nishibu, Yoshinobu Eishi. Transepidermal elimination of sarcoidal granuloma
   in the lesional skin of psoriasiform sarcoidosis. J. Dermatol.. 2017.01; 44(1); 100-101

3. Tomoya Kakegawa, Yuan Bae, Takashi Ito, Keisuke Uchida, Masaki Sekine, Yutaka Nakajima, Asuka
   Furukawa, Yoshimi Suzuki, Jiro Kumagai, Takumi Akashi, Yoshinobu Eishi. Frequency of Propionibac-
terium acne Infection in Prostate Glands with Negative Biopsy Results Is an Independent Risk Factor
for Prostate Cancer in Patients with Increased Serum PSA Titers. PLoS ONE. 2017.01; 12(1); e0169984

4. Kenro Kawada, Tatsuayuki Kawano, Taro Sugimoto, Kazuya Yamaguchi, Yuundai Kawamura, Toshihiro
   Matsui, Masafumi Okuda, Taichi Ogo, Yuichiho Kume, Yutaka Nakajima, Andres Morá, Takuya Okada,
   Akihiro Hoshino, Yutaka Tokairsin, Yasuaki Nakajima, Ryuhei Okada, Yusuke Kiyokawa, Fuminori No-
mura, Takahiro Asakage, Ryo Shimoda, Takashi Ito. Case of Superficial Cancer Located at the Pharyn-
goesophageal Junction Which Was Dissected by Endoscopic Laryngopharyngeal Surgery Combined with
Endoscopic Submucosal Dissection. Case Rep Otolaryngol. 2017.01; 2017; 1341059

5. Jessica L Werner, Sylvia G Escolero, Jeff T Hewlett, Tim N Mak, Brian P Williams, Yoshinobu Eishi,
   Gabriel Nuñez. Induction of Pulmonary Granuloma Formation by Propionibacterium acne Is Regulated
by MyDSS8 and Noc2. Am. J. Respir. Cell Mol. Biol.. 2017.01; 56(1); 121-130

6. Kazumasa Soga, Kinya Ishikawa, Tokuro Furuya, Tadatsune Iida, Tetsuo Yamada, Noboru Ando, Kiy-
obumi Ota, Hiromi Kanno-Okada, Shinya Tanaka, Masayuki Shintaku, Yoshinobu Eishi, Hidehiro Mizu-
sawa, Takanori Yokota. Gene dosage effect in spinocerebellar ataxia type 6 homozygotes: A clinical and
neuropathological study. J. Neurol. Sci.. 2017.02; 373; 321-328

7. Yamanishi, E., Hasegawa, K., Fujita, K., Ichinoso, S., Yagishita, S., Murata, M., Tagawa, K., Akashi, T.,
Neuropathologica Communications.. 2017.03; 5(19);

8. Yumi Sakakibara, Yoshimi Suzuki, Toshihide Fujie, Takumi Akashi, Tadatsune Iida, Yasunari Miyazaki,
   Yoshinobu Eishi, Naohiko Inase. Radiopathological Features and Identification of Mycobacterial Infec-
tions in Granulomatous Nodules Resected from the Lung. Respiration. 2017.03; 93(4); 264-270


13. Nobuyasu Awano, Minoru Inomata, Soichiro Ikushima, Daisuke Yamada, Masatoshi Hotta, Shunji Tsukuda, Toshio Kumasaka, Tamiko Takemura, Yoshinobu Eishi. Histological analysis of vasculopathy associated with pulmonary hypertension in combined pulmonary fibrosis and emphysema: comparison with idiopathic pulmonary fibrosis or emphysema alone. Histopathology. 2017.05; 70(6); 896-905

14. Atsushi Oba, Atsushi Kudo, Keiichi Akahoshi, Mitsuhiro Kishino, Takumi Akashi, Eriko Katsuta, Yasuhiro Iwao, Hiroaki Ono, Yusuke Mitsumori, Daisuke Ban, Shinji Tanaka, Yoshinobu Eishi, Ukihide Tateishi, Minoru Tanabe. A simple morphological classification to estimate the malignant potential of pancreatic neuroendocrine tumors. J. Gastroenterol.. 2017.05; 70(6); 896-905


20. Natsu Yamaguchi, Yoshihi Suzuki, M H Mahbub, Hidekazu Takahashi, Ryosuke Hase, Yasutaka Ishimaru, Hiroshi Sumagawa, Rie Watanabe, Yoshinobu Eishi, Tsuyoshi Tanabe. The different roles of innate immune receptors in inflammation and carcinogenesis between races. Environ Health Prev Med. 2017.10; 22(1); 70


[Conference Activities & Talks]

1. Yoshinobu EISHI. Etiology of sarcoidosis as an allergic endogenous infection caused by Propionibacterium acnes. Institution at the University Hospital of Essen 2017.07.19 Essen,Germany

2. Yoshinobu EISHI. Etiology of sarcoidosis as an allergic endogenous infection caused by Propionibacterium acnes. Institute of Pathology at the University of Freiburg 2017.07.20 Freiburg,Germany
Systemic Organ Regulation

Physiology and Cell Biology

Junior associate professor: Shingo Sato
Assistant professor: Hiroki Ochi
Assistant professor: Satoko Sunamura

(1) Outline

Recent progress in molecular biology and genetics advanced our understanding of molecular basis of physiological function and pathophysiological mechanisms of various diseases. Besides, signal transduction system using intercellular, intersystem, and inter-organ networks has been shown to be essential for whole-body homeostatic function. In our department, we are studying on the inter-organ regulatory networks of metabolism, especially between bone and the other organs.

(2) Research

1. Studies on the regulatory network of metabolism between bone and the other internal organs: It had been believed that bone is controlled by local environment through the action of hormones and cytokines, independently of the other organs. However, our discovery that leptin regulates bone formation through the central nervous system shed light on a new regulatory system of bone metabolism, i.e., neuronal control (Takeda S, Cell, 2002, Nature, 2005). In addition, we have also demonstrated that neuromedin U, an anorexigenic neuropeptide, regulates bone formation through the central nervous system (Sato S, Nat Med, 2007). Moreover, recent studies have revealed that FGF23 or osteocalcin, which is secreted by bone, regulates the metabolism of kidney or pancreas. Thus, bone is now considered as a major player for whole-body homeostasis, and forms a regulatory network of metabolism together with the other organs. We are now conducting further experiments to clarify a comprehensive network between bone and the other organs.

2. Studies on the regulation of bone metabolism by sensory nerves: We have recently revealed that sensory nerves inside bones have a crucial role in regulating bone mass, and that the penetration of sensory nerves into bones is necessary for normal bone development or fracture healing (Fukuda T, Nature, 2013). Based on these findings, we are now conducting further experiments to develop novel therapeutic approaches to osteoporosis.

3. Studies on the regulation of bone metabolism and bone metastasis by microRNA: microRNA (miRNA) is a small non-coding RNA molecule, and regulates various developmental and homeostatic events in vertebrates and invertebrates. Aberrant expression of miRNA has been implicated in numerous disease states, and miRNA-based therapies are under investigation. We have previously demonstrated the physiological role of miRNA in osteoblast differentiation (PNAS, 2009). We also investigated the role of miRNA in bone metastatic microenvironment and recently demonstrated that bone metastatic lesions could be regulated by miRNAs secreted by cancer cells (Sato S, Hashimoto K, PNAS, 2018). We are now conducting further experiments to identify novel miRNAs regulating bone metabolism or bone metastasis and to develop new diagnostic or therapeutic approaches.

4. Studies on the mechanical regulation of musculoskeletal system: In Japan, the number of patients with osteoporosis or sarcopenia have rapidly increased. Mechanical stress is known to be essential for the maintenance of bone volume or muscle strength. However, the mechanism of the mechanical regulation remains elusive. We are now elucidating the role of gravity on bone or muscle homeostasis as well as on neurovascular formation in
bone or muscle tissues by utilizing a tail suspension mouse model.

5. Studies on the mechanism in the development of bone and soft tissue sarcomas: Sarcomas are malignancies derived from mesenchymal tissues such as bone, muscle, fat, and cartilage. Molecular mechanisms in the occurrence and growth of sarcomas have yet to be elucidated. Even the cell of origin for most sarcomas still remains unclear. We have recently established a novel mouse model for osteosarcoma and also demonstrated that sarcomas could be derived from pericytes with mutations of crucial genes. Based on these findings, we are now conducting further experiments to elucidate the detailed mechanism of sarcoma development.

(3) Education

We give lectures and laboratory teachings about physiology to sophomore medical students. We also teach experimental techniques to undergraduate students to develop young basic scientists. PhD students are required to join our research team and learn various experimental techniques including molecular biology, cellular biology, and physiology.

(4) Lectures & Courses

All students are expected to understand the background of the research field and bring up relevant scientific questions to verify the hypothesis. They are also expected to develop their scientific thinking with effective questions and cultivate their abilities to analyze obtained results objectively, discuss them logically and scientifically, and present them effectively.

(5) Publications

[Original Articles]


4. Hirakawa H, Gatanaga H, Ochi H, Fukuda T, Sunamura S, Oka S, Takeda S, Sato S. Antiretroviral therapy containing HIV protease inhibitors enhances fracture risk by impairing osteoblast differentiation and bone quality JOURNAL OF INFECTIOUS DISEASES. 2017.05; 215(12); 1893-1897

[Misc]

1. Sato S. Mouse models for bone and soft tissue sarcoma Bone Joint Nerve. 2017.07; 7(3); 375-383


[Conference Activities & Talks]

1. Shingo Sato. The role of orthopaedic surgeons in the management of bone metastasis patients. The 45th Kyoto Orthopaedic Seminar 2017.03.07 Kyoto

2. Sato S. Reduction in the frequency of pathological fracture by medical and dental combined treatment system for bone metastasis. The 43rd Annual Meeting of the Japanese Society for Fracture Repair 2017.07.08 Fukushima
3. Sato S. The osteoblastic phenotype of bone metastasis can be induced by microRNA secreted from cancer cells. The 50th Annual Musculoskeletal Tumor Meeting of the Japanese Orthopaedic Association 2017.07.14 Tokyo


Molecular Cellular Cardiology

(1) Outline

This laboratory focuses on understanding pathogenesis of intractable and common cardiovascular diseases using multidisciplinary approach (patch-clamp, cell biology, optical recording, genetic analysis, and computational analysis). Our ultimate goal is to improve diagnosis and management of intractable and common cardiovascular diseases.

(2) Research

1. Pathogenesis of atrial fibrillation (AF)

Combining discovery panel and replication panel, we performed GWAS in 113,00 AF cases and 153,676 controls in Japanese population, and identified total 14 AF-sensitive SNPs. We calculated weighed genetic risk score (wGRS) and divided them into quartiles; the highest quartile group (top 25%) had 7.58-fold higher incidence of AF compared to the lowest quartile group (bottom 25%) (integrated odds ratio) (Nat. Genet. 2017;70:180-184). In order to carry out personalized medicine involving medical intervention, we require odds ratio up to around 50. Thus, to raise odds ratio from less than 10 to about 50 is the bottle-neck to materialize personalized medicine. Since most SNPs with high odds ratio have been identified through 3 rounds of GWAS, it is impossible by increasing sample numbers for genetic analysis to overcome this bottle-neck. Then, we searched for AF-sensitive biomarkers, and identified 4 AF biomarker candidates. We compared circulating miRNA between serum from 100 AF patients and those from 100 controls with miRNA array. We also compared circulating miRNA between AF mice and non-AF mice in 2 mouse AF models, a pressure-overload model and a high-fat-diet model. We found 4 circulation miRNAs (miR-99a-5p, miR-192-5p, miR-214-3p, miR-342-5p), which showed significant difference between AF and non-AF both in human and mouse. Combining 4 miRNAs, we could segregate AF from non-AF with 76% sensitivity and 80% selectivity.

2. Pannexin for ischemic preconditioning

Pannexin is a member of gap-junction channel, which is not involved in the formation of gap-junction channels between cells, but provides hemi-channels on the surface of the membrane and transport small molecules between cytosol and extracellular space. Pannexin functions as chloride channels in the basal condition and as ATP-release channels after mechanical stimuli. Being suffered from myocardial infarction, hearts with prior ischemic...
events (angina) develop reduced size infarcted size compared with those without prior ischemic events. The effect of prior ischemic events is referred as “ischemic pre-conditioning”. Though extracellular ATP is known to play an important role for ischemic pre-conditioning, the source of ATP is not known. Using pannexin-1 (a major isoform of pannexin in hearts) KO mouse, we found that ATP released during hypoxia was much lower in KO mice than in WT mice. Ischemic pre-conditioning reduced the infarcted area in WT mice, which was almost abolished in KO mice. Taken together, we conclude that hypoxia-activated pannexin provides extracellular ATP, which is required for the ischemic pre-conditioning.

Next, we have proposed the working hypothesis that pannexin activators would work as a potential new drugs against ischemia heart diseases. Then, we performed screening of chemical library present in the TMDU chemical screening center. We found 2 small molecules that could activate pannexin-1. We would try to confirm their potential as new ischemia drug seeds in in vivo study.

3. Electrophysiological Assessment of Murine heart with High-Resolution Optical Mapping

Conventional optical mapping of murine heart, especially of its atra, has some critical problems due to its small size. To overcome them, we developed the novel electrophysiological assessment method for elucidating the underlying mechanism of arrhythmogenesis using murine heart by combining high spatial and temporal resolution optical mapping system and precise electrophysiological study (J. Vis. Exp 2018 in press). This novel method will contribute to assessing the onset and maintenance mechanism of arrhythmias precisely in various mouse models.

4. Sex specific mRNAs/miRNAs expression in human/murine heart diseases

Sexual dimorphisms in various heart diseases; ex ICM, MI and DCM are well known. However, the questions why these diseases onset in men/males are higher than in women/females remain unsolved. Here, we show that the transcriptional profiles of mRNAs and miRNAs between men/males and women/females from left ventricles in heart development, their failures and MI models. In this profile, mRNA and miRNA transcriptome of normal and disease heart show significant sex differences, which might impact the cardiac homeostasis (Tsuji et al., PLoS One 2017). Especially, we identified 2 miRNAs; miR2861, miR-139-5p, which have unique expression patterns during heart development and its disease by in silico analysis and GO analysis. Together this study provides the first comprehensive picture of the genome-wide program underlying the heart sexual dimorphisms, laying the foundation for gender specific treatment strategies.

(3) Education

School of Medicine

2nd grade Introduction to Neurophysiology (2 units)
2nd grade Physiology (6 units)
3rd grade Cardiology (1 unit)
4th grade Project semester

School of Dentistry

3rd grade Pharmacology III(2 units)
3rd grade Practice for Pathophysiological Sciences (2 units)

School of Health Care Medicine

3rd/4th grade Cardiac physiology (8 units)

(4) Publications

[Original Articles]


[Books etc]


[Misc]

1. Tetsushi Furukawa. Arrhythmias originating from licalized areas of the heart. SEITAI NO KAGAKU. 2017.12; 68(6); 564-568

[Conference Activities & Talks]


Stem Cell Regulation

Professor Tetsuya TAGA
Associate Professor Ikuo NOBUHISA
Assistant Professor Kouichi TABU
Technical Assistant/Administrative Assistant Kazuko INOUE

(1) Outline

Research in this department has been conducted to elucidate the mechanisms by which stem cells are regulated. The major focus has been on neural stem cells, hematopoietic stem cells, and cancer stem cells. The study is aimed to understand development, maintenance, and regeneration of the central nervous system and the hematopoietic system, and to obtain a clue to tackle the problem of cancer recurrence. Particular attention is given to cell-external cues (such as cytokines) and cell-intrinsic programs (including epigenetic modification), taking cross-interactions of transcriptional regulatory signals into consideration.

(2) Research

Research Subjects in this department are as follows:

1) Molecular basis for the maintenance of neural stem cells
2) Regulation of the neural stem cell fate
3) Characterization of hematopoietic stem cells in fetal hematopoietic organs
4) Characterization of cancer stem cells and their niche
5) Epigenetic regulation of neural development

(3) Education

Our education has been conducted to elucidate the mechanisms by which stem cells are regulated. The major focus has been on neural stem cells, hematopoietic stem cells, and cancer stem cells. The study is aimed to understand development, maintenance, and regeneration of the central nervous system and the hematopoietic system, and to obtain a clue to tackle the problem of cancer recurrence. The projects have been performed, for instance by elucidation of stem cell characteristics, analysis of transcriptional regulatory signaling pathways, and identification of niche signals.

(4) Lectures & Courses

Under our education program, students will learn the molecular basis of stem cell regulation in view of cell-extrinsic signals and cell intrinsic-programs during tissue development, maintenance, and regeneration from molecular to whole-body levels. Students will receive exposure to cutting edge concepts and research technologies, and study regulatory mechanisms in neural, hematopoietic, and cancer stem cells. With emphasis also on physiological and pathological conditions surrounding the stem cells, we aims to improve student’s understanding of stem cells from multiple viewpoints.
(5) **Publications**

**[Original Articles]**


**[Conference Activities & Talks]**

1. Tabu K and Taga T. Self-maintenance strategies of glioma stem cells (GSCs) involving GSC-induced protumoral macrophages. 11th International Symposium of The Institute Network 2017.01.27 Tokushima University, Tokushima, Japan


4. Taga T and Tabu K. Glioma progression by intrinsic capacities of glioma stem cells to organize a self-advantageous microenvironment niche for their maintenance and expansion. The 38th Annual Meeting of the Japanese Society of Inflammation and Regeneration, Symposium 'Diseases and Stem Cells' 2017.07.18 Osaka International Convention Center, Osaka

5. Tabu K, Wang W, Murota Y and Taga T. Self-expanding strategies of glioma stem cells that involves macrophages to adapt to iron-deprivation stress. The 76th Annual Meeting of the Japanese Cancer Association 2017.09.28 Pacifico Yokohama, Yokohama, Japan


7. Saito K, Nobuhisa I, and Taga T. The mechanism of maintaining the undifferentiated state of hematopoietic stem cell by Sox17 and TET family members. The 40th Annual Meeting of the Molecular Biology Society of Japan 2017.12.07 Kobe International Conference Center, Kobe, Japan


Molecular Pharmacology

Professor: Masaki Noda, M.D., Ph.D.
Associate Professor: Yoichi Ezura, M.D., Ph.D.
Assistant Professor: Yayoi Izu, DVM, Ph.D.
Research Assistant Professor: Smriti Aryal A.C., DDS, Ph.D.

(1) Outline

In order to contribute to the establishment of therapy and prevention for osteoporosis and the other calcium-related disorders, we are elucidating molecular mechanisms underlying regulation of calcium metabolism with emphases on bone formation and resorption. Skeletal system is the largest storage site for calcium in a living body and its metabolism is conducted by a complex cell society consisting of bone-forming osteoblasts and bone-resorbing osteoclasts as well as stromal cells and chondrocytes. In our department, we take molecular and cellular biological approaches to study the mechanisms underlying regulation of development, differentiation, and function of these cells.

(2) Research

Bone is the major organ for calcium metabolism in our body. The regulation of bone metabolism is mediated by a balance between osteoblastic bone formation and osteoclastic bone resorption. These activities are maintained in balance and called bone remodeling. Imbalance of the remodeling results in development of bone disorders, such as osteoporosis. Osteoblasts are differentiated from mesenchymal stem cells. These cells are under the regulation by local and systematical factors, such as growth factors and hormones. These factors activate intracellular signaling, which promotes transcription factors thereby delineates cell differentiation. In our laboratory, we are studying the process from various aspects of bone cell regulation including transcription factors, cytokines and hormones. To promote our study, knockout and transgenic mice, gene introduction via virus, global analysis of gene expression, and genome database analysis are used. Our study will provide the basic understandings of bone homeostasis, which will contribute the development of measures for diagnosis and treatment of bone disorders.
Stem Cell Biology

Professor: Emi Nishimura, M.D., Ph.D.
Associate Professor: Daisuke Nanba, Ph.D
Assistant Professor: Hiroyuki Matsumura, Ph.D.
Project Assistant Professor: Yasuaki Mohri, Ph.D.
Hironobu Morinaga, Ph.D.
Kyosuke Asakawa, Ph.D.
Researcher: Yasuko Kato
Gu jie

(1) Outline

Stem cell systems play fundamental roles in tissue turnover and homeostasis. Our goal is to understand the mechanisms of tissue homeostasis driven by stem cell systems and to apply the knowledge to better understand the mechanisms underlying specific tissue decline by aging, cancer development and other diseases associated with aging. We further aim to apply this knowledge to drug discovery and regenerative medicine using somatic stem cells and the prevention and treatment of age-associated diseases.

(2) Research

1) Identification of stem cells in the skin
The skin is the largest organ in the body. Hair follicles in the skin constantly renew themselves by alternate phases of growth, regression and rest. During this process, mature melanocytes (pigment cells) in hair follicles are replaced by a new cell population every hair cycle. We previously identified the source of those melanocytes, "melanocyte stem cells" (McSC), which are located in the hair follicle bulge and supply mature melanocytes required for hair and skin pigmentation (Nishimura EK et al. Nature 2002). We currently identified McSCs in eccrine sweat glands in non-hair-bearing skin areas as well (Okamoto N et al. PCMCR, 2014). Also we are currently searching for the prospective method for identification of epidermal keratinocyte stem cells in mouse and human skin.

2) Mechanisms of stem cell maintenance
The underlying mechanisms of stem cell maintenance is a fundamental issue in stem cell biology and medicine. We previously demonstrated that the niche microenvironment plays dominant role in melanocyte stem cell fate determination (Nishimura EK et al. 2002). We then revealed that hair follicle stem cells (HFSC), which surround McSCs in the hair follicle bulge-subbulge area, serve as a functional niche for McSC maintenance through transforming growth factor β (TGF-β) (Nishimura EK et al. Cell Stem Cell, 2010)(Tanimura S et al. Cell Stem Cell 2011). As intrinsic defects in stem cells such as caused by Mitf or Bcl2 deficiency also induces McSC depletion which leads to the progressive expression of hair graying phenotype, incomplete maintenance of McSCs either by defective signaling from the stem cell niche or by intrinsic defects in stem cells induces the progressive hair graying phenotype.

3) Mechanisms for stem cell aging and tissue/organ aging
Physiological hair graying is the most obvious outward sign of aging in mammals, yet it has been unclear what causes the incomplete maintenance of MsSCs during the course of aging (Nishimura EK et al. Science 2005). We have found that genotoxic stress abrogates renewal of McSCs by triggering their differentiation without in-
duc ing stem cell apoptosis nor cellular senescence. Our findings indicated that a “stem cell renewal checkpoint” exists to maintain the quality of the melanocyte stem cell pool (Inomata K, Aoto T et al. Cell 2009). Similar checkpoint has been found in other somatic stem cell systems as well and we recently found that HFSCs also have similar checkpoint mechanism. We are currently studying the underlying molecular mechanism.

4) Hair follicle aging is driven by stem cell-centric aging program
Hair thinning/loss is a prominent aging phenotype but has an unknown mechanism. We show that hair follicle stem cell (HFSC) aging causes the stepwise miniaturization of hair follicles and eventual hair loss in wild-type mice and in humans. In vivo fate analysis of HFSCs revealed that the DNA damage response in HFSCs causes proteolysis of Type XVII Collagen (COL17A1/BP180), a critical molecule for HFSC maintenance, to trigger HFSC aging, characterized by the loss of stemness signatures and by epidermal commitment. Aged HFSCs are cyclically eliminated from the skin through terminal epidermal differentiation, thereby causing hair follicle miniaturization. The aging process can be recapitulated by Col17a1-deficiency and prevented by the forced maintenance of COL17A1 in HFSCs, demonstrating that COL17A1 in HFSCs orchestrates the stem cell-centric aging program of the epithelial mini-organ (Matsumura H et al. Science 2016).

5) Development of skin regeneration technology with human skin stem cells and/or stem cell-targeted small molecules
Human epidermal keratinocyte stem cells can be cultivated under suitable conditions, and generate a progeny large enough to entirely reconstitute the epidermis of an adult human. This has enabled the autologous transplantation of cultured epidermal sheets onto patients with extensive burns. However, the cultured keratinocytes can regenerate only the epidermis and cannot suppress dermal scarring. To develop novel skin regeneration technology, we have investigated human epidermal keratinocytes and found that human epidermal keratinocyte stem cells can be identified in situ by analyzing cell motion during their cultivation (Nanba et al., J. Cell Biol., 2015). The identification of keratinocyte stem cells by image analysis is a valid parameter for quality control of cultured keratinocytes for transplantation, and improves the clinical outcome of cell therapy and the efficiency of cell manufacturing for regenerative medicine. Finally, the treatment of skin ulcer and decubitus is an urgent problem in this aging society. We are currently trying to establish the screening system for small molecules that activate stem cells in the wound edge.

(3) Publications

[Original Articles]
1. Matsumura H., Mohri Y., Nguyen T., Morinaga H., Fukuda M., Ito M., Kurata S., Hoeijmakers J., Nishimura E. K.. Defective maintenance of hair follicle stem cells through COL17A1 loss orchestrates the hair follicle aging program JOURNAL OF INVESTIGATIVE DERMATOLOGY. 2017.10; 137(10); S235

2. Nanba D., Toki F., Matsumura H., Toki H., Nishimura E. K.. Locomotive ability of human keratinocyte stem cells is an intrinsic property for stem cell expansion and epidermal reconstruction JOURNAL OF INVESTIGATIVE DERMATOLOGY. 2017.10; 137(10); S310

3. Nanba D., Toki F., Matsumura H., Toki H., Nishimura E. K.. Locomotive ability of human keratinocyte stem cells is an intrinsic property for stem cell expansion and epidermal reconstruction JOURNAL OF INVESTIGATIVE DERMATOLOGY. 2017.10; 137(10); S310
[Conference Activities & Talks]

1. Emi Nishimura. Stem cell aging: the core to orchestrates tissue aging. Aging Science:from Molecules to Society-Aging Biology- 2017.05.09 Tohoku University

2. Emi K. Nishimura. Tissue aging program based on stem cell aging in hair follicle. KEYSTONE SYM-POSIA on Molecular and Cellular Biology -Aging and Mechanisms of Aging-Related Disease- 2017.05.15 Pacifico YOKOHAMA, Kanagawa, Japan

3. Emi K. Nishimura. Stem cells orchestrates hair follicle aging program. International Society for Stem Cell Research 2017 Annual Meeting 2017.06.14 Boston, USA

4. Emi K. Nishimura. Melanocyte stem cells in eccrine sweat glands: a potential original of acral melanoma. IPCC2017 2017.08.26 Denver, USA

5. Emi K. Nishimura. Stem cells orchestrates hair follicle aging program. WCHR2017(10th World Congress for Hair Research) 2017.10.01 Kyoto, Japan


7. Emi K. Nishimura. Stem cells orchestrates hair follicle aging program. WCHR2017(10th World Congress for Hair Research) 2017.11.03 Kyoto, Japan

8. Emi K. Nishimura. The mechanism of aging-associated hair graying and hair thinning: toward the discovery of pharmacological targets. WCHR2017(10th World Congress for Hair Research) 2017.11.03 Kyoto, Japan

9. Emi K. Nishimura. Stem cells orchestrates hair follicle aging program. Stem Cell in Disease Modeling and Therapeutics 2017.11.13 Tokyo, Japan


[Awards & Honors]

1. Myron Gordon Award, International federation of Pigment Cell Societies(IFPCS), 2017.08
Respiratory Medicine

Professor: Naohiko INASE
Junior Associate Professor: Toshihide FUJIE
Assistant Professor: Tomoya TATEISHI, Haruhiko FURUSAWA, Masahiro MASUO, Tsuyoshi SHIRAI
Graduate Students: Mayuko TAO, Yuta ADACHI, Ken UCHIBORI, Yu KUSAKA, Rie SAKAKIBARA, Manabu SEMA, Tomoko TERADA, Yoshiiisa NUKUI, Takayuki HONDA, Takahiro MITSUMURA, Sho SHIBATA, Yukihisa INOUE, Hiroaki SAITOCH, Satoshi HANZAWA, Naoki NISHIYAMA, Takashi YAMANA

(1) Outline
Respiratory Medicine deals with a variety of pulmonary diseases including tumors, infectious diseases, allergic diseases, non-allergic inflammatory diseases, and genetic disorders.

(2) Research
1) Pathogenesis of hypersensitivity pneumonitis and detection of environmental causative antigen
2) Airway remodeling in bronchial asthma model
3) Acute exacerbation in pulmonary fibrosis
4) Proteomics of pulmonary fibrosis
5) Pathogenesis of pulmonary fibrosis and emphysema

(3) Education
Main objective in the graduate course is to provide students to study specific diagnostic modalities as well as basic scientific findings regarding the pathogenesis of pulmonary diseases. Students are also taught on basic science and its related laboratory technology depending upon their research subject.

(4) Lectures & Courses
Students should try to understand a variety of pulmonary diseases in terms of scientific aspect and make an appropriate plan to examine unsolved research questions.

(5) Clinical Services & Other Works
Our clinic provides a full spectrum of diagnosis and treatment of a variety of pulmonary diseases. Consultant system is open to all departments in this hospital and daily clinical conference regarding inpatients is organized by professors of the department. In outpatient clinic, chemotherapy, home oxygen therapy, management of sleep apnea, and arrange of clinical studies are provided.

(6) Clinical Performances
We have immunological tools to examine hypersensitivity pneumonitis including antigen inhalation challenge test, specific antibody against causative antigen, and lymphocyte proliferation test. Many patients with interstitial lung diseases in Japan are referred to our clinic.
(7) Publications

[Original Articles]


[Conference Activities & Talks]


3. Sema M, Miyazaki Y, Inase N. Measurement of avian antigen in household dust for measurement of chronic bird-related hypersensitivity pneumonitis.. ATS International Conference 2017.05.21 Washington DC


5. Saito H, Miyazaki Y, Furusawa H, Yamamoto Y, Yamamoto H, Inase N. A role of RAGE anf HMGB-1 in chronic hypersensitivity pneumonitis.. ATS International Conference 2017.05.21 Washington DC


7. Ishizuka M, Miyazaki Y, Inase N. Validation of new prediction score in inhalation provocation test for chronic hypersensitivity pneumonitis.. ATS International Conference 2017.05.23 Washington DC

8. Tateishi T, Fujie T, Saito H, Miyazaki Y, Inase N. Serum angiopoietin-2 can be a biomarker in acute exacerbation of interstitial pneumonia. . ATS International Conference 2017.05.23
9. Shota Hayashi, Masayuki Hideshima, Naoki Ishihara, Tomohiro Kurashima, Shusuke Inukai, Yuuko Mitsuma, Shuhei Nakamura, Toshihide Fujie, Yasunari Miyazaki, Meiyo Tamaoka. Conversion from continuous positive airway pressure therapy to oral appliance therapy for obstructive sleep apnea in Tokyo Medical and Dental University Hospitals. 16th the Japanese Academy of Dental Sleep Medicine 2017.11.04 Yamaguchi, Japan
Gastroenterology and Hepatology

Professor  Mamoru WATANABE

Professor  Yasuhiro ASAHINA (Department for Hepatitis Control)
            Kazuo OHTSUKA (Department of Endoscopic Diagnosis and Therapeutics)
            Ryuichi OKAMOTO (Center for Stem Cell and Regenerative Medicine)
            Tetsuya NAKAMURA
            (Department of Advanced Therapeutics in Gastrointestinal Diseases)

Associate Professor
            Akihiro ARAKI (Center for Personalized Medicine for Healthy Aging)
            Sei KAKINUMA (Department for Hepatitis Control)
            Kiichiro TSUCHIYA (Gastroenterology and Hepatology)
            Mina NAKAGAWA (Center for Interprofessional Education)
            Takashi NAGASHI
            (Department of Advanced Therapeutics in Gastrointestinal Diseases)
            Katsuyoshi MATSUOKA
            (Department of Advanced Therapeutics in Gastrointestinal Diseases)

Project Associate Professor  Masakazu NAGAHORI

Junior Associate Professor
            Cheng-Hsin AZUMA (Department of Gastroenterology and Hepatology)
            Yasuhiro ITSUI (Department of General Medicine)
            Eriko OKADA (Department of General Medicine)

Assistant Professor
            Shigeru OSHIMA, Eiko SAITO, Yasuhiro NEMOTO, Toshimitsu FUJII,
            Michio ONIZAWA (Department of Advanced Therapeutics in Gastrointestinal Diseases)
            Shiro YUI (Center for Stem Cell and Regenerative Medicine)
            Miyako MURAKAWA(Clinical Laboratory)
            Masayoshi FUKUDA(Department of Endoscopic Diagnosis and Therapeutics)

Project Assistant Professor  Sayuri NITTA, Ryu NISHIMURA

Hospital Staff  Kenji OTANI, Tatsuo MURANO, Taichi MATSUMOTO, Toru NAKATA, Masato YAUCHI,
                Konomi KUWABARA, Maiko KIMURA, Takashi FUJII, Hiroko NAGATA, Syun KANEKO,
                Yoichi NIBE, Syuji HIBIYA, Taro WATABE, Yuka MATSUMOTO, Ayako WATANABE,
                Kento TAKENAKA, Nobuhiro KATSUKURA, Kohei SUZUKI, Fukiko KITAHATA,
                AMED Fellow  Syuji HIBIYA,
                Fellow  Satoru FUJII

Graduate Student  Hiroko NAGATA, Shun KANEKO, Chiaki MAEYASHIKI, Taro WATABE,
                  Yuka MATSUMOTO, Kohei SUZUKI, Akinori HOSOYA, Yu ASANO,
                  Shintaro AKIYAMA, Fumiaki ISHIBASHI, Emi INOUE, Ami KAWAMOTO,
                  Masato MIYOSHI, Tomoyuki TSUNODA, Yuria TAKEI, JOSE Nisha, Sho ANZAI,
                  Tomoaki SHIRASAKI, Shoihei TANAKA, Reiko KUNO, Kana OTSUBO, Ayako Sato,
                  Sho WARANABE, Maiko MOTOHASHI, Konomi KUWABARA, Hiroki MATSUDA,
                  Takehito ASAKAWA, Ai MINAMIHARA, Ryo MORIKAWA, Emi AONUMA, Mao KAWAI,
                  Jyunichi TAKAHASHI, Naoya TSUGAWA, Yuta KOJIMA, Minami HAMA
(1) Outline

Research project is selected from the clinical problems in the Gastroenterology and Hepatology to understand the research policy, as clinical science that the results of research project finally should be restored to clinical medicine.

The purpose of this course is the understanding the situation of inflammatory bowel disease (IBD) in Japan and the problems about the pathogenesis and intractable cause of IBD. In addition, the understanding the pathogenesis and problems about the liver diseases such as viral hepatitis, cirrhosis and hepatocellular carcinoma is the purpose of this course.

(2) Research

Basic Research Projects
Systemic Organ Regulation

· Elucidating the pathophysiology of inflammatory bowel diseases and development of treatment by disease-specific immune-regulation.
· Development of novel therapeutics for inflammatory and allergic diseases based on gut-specific mucosal immune regulation.
· Basic research and clinical application of regenerative medicine in gastrointestinal diseases.
· Analysis of interferon-resistant hepatitis C virus.
· Comprehensive analysis of susceptibility genes for various gastrointestinal diseases.
· Crosstalk of the signaling pathways in intestinal epithelial cells.
· Functional analysis of the intestine using primary cell culture in vitro.

(3) Education

We believe that the central role of clinical departments in the graduate school is to establish basis for the innovative medicine / medical treatment in the next generation. Basic research lead by clinical concepts, and development of novel therapeutics established upon basic research are both critically required to achieve our mission. Therefore, our primary goal is set to train highly educated and experienced clinician-researchers in the field of gastroenterology and hepatology.

In the clinical area, we pursue development and application of highly advanced technologies, including novel endoscopic procedures, for sophisticated diagnosis and treatment of gastrointestinal and liver diseases. In basic research, our principle is to achieve "clinical science", a research evoked from various clinical problems, and also directed to launch innovative therapeutic procedures to the daily clinical practice. Based on these principals, we are running research projects to 1) develop novel therapy for refractory inflammatory bowel diseases, 2) prevent progression of liver failure in chronic hepatitis patients and 3) improve anti-cancer therapy for the treatment of gastrointestinal malignancies, by expanding our distinct basic research findings in the area of mucosal immunology, liver immunology, regenerative medicine and virology, to various clinical settings. Moreover, we promote both intra- and inter-national exchanges of researchers, and provide good opportunities to study abroad. The final goal of our education is to promote students to become a well-developed clinician researcher, and also a leading expert in the field of gastroenterology and hepatology.

(4) Lectures & Courses

Research Conference       every Tuesday 18:00 19:30
Journal Club               every Tuesday 18:00 19:30

(5) Clinical Services & Other Works

Expert Areas in Clinical Practice
· Immune-regulation based treatment of inflammatory bowel diseases.
Prevention of chronic hepatitis progression to hepatocellular cancer and liver failure, by virology-based treatment strategy.
Clinical trial of innovative treatment for hepatocellular cancer.
Diagnosis and treatment of small intestinal diseases by balloon enteroscopy and capsule enteroscopy.
Advanced diagnosis and treatment of colonic diseases by colonoscopy.
Development of minimally-invasive diagnostic modalities for gastrointestinal diseases (i.e. MR enteroclysis).
Improved chemotherapy for gastric and pancreatic malignancies.

(6) Clinical Performances

Therapeutics of inflammatory bowel diseases by corrections of immunological disfunctions.
Diagnostic and interventional gastrointestinal endoscopy
Antiviral therapies against chronic viral hepatitis and preventions of hepatic malignancy novel interventions of hepatic malignancy.

(7) Publications

[Original Articles]


7. Shinya Sugimoto, Makoto Naganuma, Yasushi Iwao, Katsuyoshi Matsuoka, Masayuki Shimoda, Shuji Mikami, Shinta Mizuno, Yoshihiro Nakazato, Kosaku Nanki, Nagamu Inoue, Haruhioko Ogata, Takanori Kanai. Endoscopic morphologic features of ulcerative colitis-associated dysplasia classified according to the SCENIC consensus statement. Gastrointest. Endosc. 2017.03; 85(3); 639-646.e2


10. Chiaki Maeyashiki, Shigeru Oshima, Kana Otsubo, Masanori Kobayashi, Yoichi Nibe, Yu Matsuzawa, Michio Onizawa, Yasuhiro Nemoto, Takashi Nagaishi, Ryouchi Okamoto, Kiichiro Tsuchiya, Tetsuya Nakamura, Mamoru Watanabe. HADHA, the alpha subunit of the mitochondrial trifunctional protein, is involved in long-chain fatty acid-induced autophagy in intestinal epithelial cells. Biochem. Biophys. Res. Commun. 2017.03; 484(3); 636-641


14. Masakazu Nagahori, Shuji Kochi, Hiroyuki Hanai, Takayuki Yamamoto, Shiro Nakamura, Soji Omuoro, Mamoru Watanabe, Toshifumi Hibi. Real life results in using 5-ASA for maintaining mild to moderate UC patients in Japan, a multi-center study, OPTIMUM Study. BMC Gastroenterol. 2017.04; 17(1); 47


25. Yuka Matsumoto, Wakaichi Machizuki, Shintaro Akiyama, Taechi Matsumoto, Kengo Nozaki, Mamoru Watanabe. Distinct intestinal adaptation for vitamin B12 and bile acid absorption revealed in a new mouse model of massive ileocecal resection. Biol Open. 2017.09; 6(9); 1364-1374


36. Shintaro Akiyama, Wakana Mochizuki, Yoichi Nibe, Yuka Matsumoto, Kei Sakamoto, Shigeru Oshima, Mamoru Watanabe, Tetsuya Nakamura. CCN3 Expression Marks a Sulfomucin-nonproducing Unique Subset of Colonic Goblet Cells in Mice. Acta Histochem Cytochem. 2017.12; 50(6); 159-168


[Books etc]
1. Nagaishi T, Watanabe M. Crohn’s Disease and Ulcerative Colitis: from Epidemiology and Immunobiology to a Rational Diagnostic and Therapeutic Approach. 2017.03 (ISBN : 978-3-319-33701-2)

[Misc]
1. Tetsuya Nakamura, Mamoru Watanabe. Intestinal stem cell transplantation. J. Gastroenterol. 2017.02; 52(2); 151-157
2. Kiichiro Tsuchiya. The significance of infectious disease and microbiota in functional gastrointestinal disorders. Journal of general and family medicine. 2017.03; 18(1); 27-31
3. Tomohiro Mizutani, Yoshiyuki Tsukamoto, Hans Clevers. Oncogene-inducible organoids as a miniature platform to assess cancer characteristics. J. Cell Biol. 2017.06; 216(6); 1505-1507

[Conference Activities & Talks]
1. Tsuchiya K. Atoh1 protein stability in sporadic colon cancer and colitis-associated cancer. BIT’ s 10th Anniversary of Protein & Peptide Conference-2017 2017.03.22 Hilton Fukuoka Sea Hawk (Japan)
2. Watanabe M. Intestinal Epithelial Stem Cells for the Treatment of GI Disease. Digestive and Liver Diseases Conference, Special Lecture 2017.04.05 Dallas (USA)


4. Watabe T, Nagaishi T, Hosoya A, Jose N, Tokai A, Kojima Y, Adachi T, Watanabe M. The lack of secreted IgA spontaneously induces the mucosal inflammation specifically in the ileum. DDW 2017 2017.05.09 Chicago (USA)

5. Matsuzawa Y, Gomez L, Cadwell K. Autophagy protein ATG16L1 confers tolerance to a commensal virus by preventing cell death in the intestinal epithelium. DDW2017 2017.05.09 Chicago (USA)


8. Watanabe M. Recent Advances in Therapy of IBD. 2017 TSIBD Spring Forum 2017.05.27 Taipei

9. Otsubo K, Oshima S, Maeyashiki C, Aonuma E, Matsuda H, Kobayashi M, Yoichi Nibe Y, Matsuzawa Y, Watanabe M. HADHA, the alpha subunit of the mitochondrial trifunctional protein, is involved in long-chain fatty acid-induced autophagy in intestinal epithelial cells. The 8th International Symposium on Autophagy 2017.05.29 Nara (Japan)


16. Matsuoka K, Watanabe M. Recent pivotal studies for IBD in Asians: current status and future directions. AOCC2017 2017.06.16 Seoul (Korea)


22. Watanabe M. Being at the leading Edge in IBD Care and Research : Chair . AOCC2017 2017.06.17 Seoul (Korea)


27. Watanabe M. 【Inflammatory Bowel Disease : Future Treatment Paradigm】 Chair. APDW2017 2017.09.25 (Hong Kong)


41. Chiba A, Nagaishi T, Miyake S. MAIT cells exacerbate the disease course of oxazolone-induced colitis. CD1-MR1 2017 2017.11.05 California (USA)

42. Watanabe M. Stem Cell Therapy for IBD: Promise and Challenge. GZDDW2017 2017.11.11 (China)


Specialized Surgeries

< Division of Specialized Surgeries>
Professor: Hiroyuki UETAKE
Associate Professor: Toshifumi KUDO, Toshiaki ISHIKAWA
Junior Associate Professor: Tsuyoshi NAKAGAWA, Kentaro OKAMOTO
Assistant Professor: Takahiro TOYOFUKU, Mai KASAHARA
Attending staff:
Masato NISHIZAWA, Yohei YAMAMOTO, Tsuyoshi ICHINOSE

< Department of Translational Oncology>
Associate Professor: Megumi ISHIGURO

< Facility of Medical Informatics>
Junior Associate Professor: Goshi ODA

( 1 ) Outline
Division of Specialized Surgeries have been launched in April 2015, which consists of 4 clinical departments in the Medical Hospital:
- Division of Chemotherapy and Oncosurgery
- Division of Vascular Surgery
- Division of Breast Surgery
- Division of Pediatric surgery

( 2 ) Research
Main themes of our research activities
- Identification of prognostic factors and the predictive factors for chemo-responsiveness in gastrointestinal and breast cancer, by molecular biological technique and immuno-histochemical approach
- Micro circulation in severe ischemic extremity
- Relation between vascular disease and periodontitis
- Development of new device for evaluating hemodynamics
- Development of safety central venous catheterization
- Establishment of telemedicine

( 3 ) Education
Main objective in the graduate course is to bring up the well-rounded surgeons who has international and scientific feelings.


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[Conference Activities & Talks]
5. Uetake H. The Current Statue of Treatment for Metastatic Colorectal Cancer: Firet-Line and Beyond. The 2017 Annual Meeting & 50th Anniversary of Taiwan Surgical Association (Lunch Seminar) 2017.03.19 Taipei
9. Igari K, Kudo T, Toyofuku T, Inoue Y. The relationship between inflammatory biomarkers and ischemic severity of patients with peripheral arterial disease. 85th EAS Congress 2017.04.24 Prague (Czech Republic)

10. Igari K, Kudo T, Toyofuku T, Inoue Y. The endovascular procedures of abdominal aortic aneurysms with challenging neck anatomy. 66th ESCVS 2017.05.14 Thessaloniki (Greece)


Cardiovascular Medicine

(1) Outline

The Department of Cardiovascular Medicine at Tokyo Medical and Dental University aims to elucidate the cause of the cardiovascular diseases, including ischemic heart diseases, arrhythmia and heart failure, and to develop their novel therapeutic strategies by assessing both basic and clinical research approaches. We encourage young doctors to be well-balanced physicians who focus on medical therapy as well as on research. Students are encouraged and being trained to take an active role at global level, as well. We strive to make high contributions in the area of cardiovascular medicine within Japan.
Research

The purposes of our investigation are to reveal the etiology and pathophysiology of cardiovascular diseases, thereby developing novel technologies for diagnosis and treatment. For that purpose we investigate clinical cases and experimental animal models. Our faculty members pursue a wide variety of basic research, ranging from investigations on the molecular mechanism of heart failure to the development of novel interventional devices for patients with angina pectoris. Current strengths of the program include molecular cardiology under Yasuhiro Maejima MD, PhD. We also actively investigate immunocardiology, the molecular mechanism of pulmonary hypertension and periodontitis-associated cardiovascular diseases.

1) System of origin with tachyarrhythmias (particularly supraventricular tachycardia) (Hirao)
2) Medical therapy and ablation for tachyarrhythmias (Hirao)
3) Research for the conduction of atrio-ventricular node (Hirao)
4) Research and Therapy for arrhythmia by using cardioendoscopy (Hirao)
5) Research of atrial fibrillation from origin of pulmonary vein (Hirao)
6) Research of genetic factor with atrial fibrillation (Hirao)
7) Research of ablation for atrial fibrillation (Hirao, Goya)
8) Clinical study for treatment of acute coronary syndrome (Ashikaga, Yamamoto, Umemoto, Sasaoka, Hatano)
9) Molecular mechanism and treatment of myocardial ischemia and reperfusion injury (Maejima, Hatano)
10) Molecular mechanism and treatment of coronary restenosis and vascular disease (Maejima, Hatano)
11) Treatment of heart failure and cardiomypathy by myocardial regeneration (Maejima)
12) Regulation of arteriosclerosis by targeting transcription factors (Maejima)
13) Diagnostic imaging of aortitis (Tezuka)
14) Assessment by imaging of coronary artery and cardiac function (Tezuka)
15) Molecular mechanism and treatment of aortitis (Maejima)
16) Assessment of vascular endothelial dysfunction in vasculitis, heart failure and arrhythmia (Maejima)
17) Application in gene therapy for heart failure and cardiomyopathy (Maejima)
18) Molecular system of myocardial remodeling in heart failure and ventricular hypertrophy (Maejima)

There are many fruitful collaborative efforts between our department and other departments with the TMDU, such as the Department of Bio-informational Pharmacology, Medical Research Institute. Collaborations with other institutions are also common. Especially, we closely collaborate with the Department of Cell Biology and Molecular Medicine, Rutgers-New Jersey Medical School (Newark, NJ, USA; Junichi Sadoshima MD, PhD). Our cardiologists continuously contribute to establish evidence-based cardiovascular medicine through clinical researches. So far, we are engaged in over ten clinical studies. The targets of our clinical research include heart failure, ischemic heart disease, arrhythmia, cardiac imaging and Takayasu arteritis.

Education

The Department of Cardiovascular Medicine at Tokyo Medical and Dental University (TMDU) primarily aims at offering patient-centered care for every person who suffer from cardiovascular diseases, including ischemic heart diseases, arrhythmia, heart failure, valvular disorders and vasculitis. Our cardiologists are experts in electrophysiology, interventional cardiology, heart failure, and cardiac imaging who make full use of state-of-the-art diagnostic tests and therapeutic procedures to provide high-quality care for every patient. We also actively engage in basic and clinical research to elucidate the mechanism of heart & vessel disorders for providing novel therapeutic strategies to the patients of cardiovascular diseases. In addition to high-quality patient care and innovative research, our faculty members are vigorously involved in the education and training to the young physicians and researchers specializing in cardiovascular medicine. Thus, we are continuously making every effort to serve the highest quality of patient care, education and innovative research of cardiovascular medicine.

Clinical Services & Other Works

Our clinical training program provides the trainee with outstanding skills in clinical cardiology. The trainees will develop their clinical knowledge, clinical judgment, procedural skills and interpersonal skills required as a specialist in cardiovascular diseases. The program provides clinical cardiology training not only at the University Hospital but also at our outstanding affiliate hospitals (N=22), including Kameda General Hospital, Musashino Red-Cross Hospital, Tsuchiura Kyodo Hospital and Yokosuka Kyosai Hospital. Our training program for re-
search emphasizes developing academic cardiologists who will become leaders in cardiovascular research. The program offers training of basic, clinical and translational researches not only at the Graduate School of our department but also at other departments with the TMDU and at other institutions described above.

(5) Publications

[Original Articles]


4. Yagishita A, Yamauchi Y, Miyamoto T, Hirao K. Electrophysiological evidence of localized reentry as a trigger and driver of atrial fibrillation at the junction of the superior vena cava and right atrium. Heart Rhythm Case Rep. 2017.01; 3(3); 164-166


6. Yagishita A, Yamauchi Y, Sato H, Yamashita S, Hirao T, Miyamoto T, Hirao K, Isobe M. Improvement in the Quality of Life and Exercise Performance in Relation to the Plasma B-Type Natriuretic Peptide Level After Catheter Ablation in Patients With Asymptomatic Persistent Atrial Fibrillation. Circ J. 2017.03; 81(4); 444-449


17. Ueshima D, Ashikaga T, Yoshikawa S, Sasaoka T, Hatano Y, Kurihara K, Maejima Y, Isobe M. Effect of over-2-year dual antiplatelet therapy on the rate of major adverse cardiac and cerebral events for everolimus-eluting stent implantation: The landmark analysis from Tokyo-MD PCI registry. J Cardiol. 2017.06; 69(6); 815-822


19. Inaba O, Satoh Y, Isobe M, Yamamoto T, Nagao K, Takayama M. Factors and values at admission that predict a fulminant course of acute myocarditis: data from Tokyo CCU network database. Heart Vessels. 2017.08; 32(8); 952-959


26. Yagishita A, Hirao K. Efficacy of Familial Screening After Sudden Cardiac Death in Young Adults Irrespective of Postmortem Analysis: Implication of a Pharmacological Challenge as a First Step of Screening. Circ Arrhythm Electrophysiol.. 2017.09; 10(9); e005710

27. Yagishita A, Hirao K. Efficacy of Familial Screening After Sudden Cardiac Death in Young Adults Irrespective of Postmortem Analysis: Implication of a Pharmacological Challenge as a First Step of Screening. Circ Arrhythm Electrophysiol.. 2017.09; 10(9); e005710


[Misc]
1. Anindita Das, Flávio Reis, Yasuhiro Maejima, Zhiyou Cai, Jun Ren. mTOR Signaling in Cardiometabolic Disease, Cancer, and Aging. Oxid Med Cell Longev. 2017.07; 2017; 6018675

2. Sebastiano Sciarretta, Yasuhiro Maejima, Daniela Zablocki, Junichi Sadoshima. The Role of Autophagy in the Heart. Annu. Rev. Physiol.. 2017.10;

[Conference Activities & Talks]
1. Maejima Yasuhiro. The critical role of autophagy in the Progression of Heart Failure. 2017.03.15

2. Maejima Yasuhiro. TXNIP accumulation caused by single nucleotide polymorphism of MLX gene enhances inflammasome formation, thereby promoting the development of Takayasu Arteritis. The 18th International Vasculitis and ANCA Workshop 2017.03.27 Tokyo, Japan

3. Yasuhiro Maejima, Yusuke Ito, Natsuko Tamura, Masanori Konishi, Mitsuaki Isobe. Factor Xa Deteriorates Atherosclerosis by Facilitating Inflammasome Formation via PAR-2-mediated Autophagy Suppression. AHA Basic Cardiovascular Sciences 2017 2017.07.10 Portland, Oregon, USA

4. Yasuhiro Maejima, Yusuke Ito, Natsuko Tamura, Masanori Konishi, Mitsuaki Isobe. Blood coagulation factor Xa promotes the progression of atherosclerosis by enhancing inflammasome formation as a consequence of PAR2-mediated autophagy inhibition. ESC Congress 2017 2017.08.26 Barcerona, Spain
Anesthesiology

Professor: Tokujiro Uchida
Junior Associate Professor: Jiro Kurata
Assistant Professor: Akio Masuda, Yusuke Ito, Atsushi Ito, Hiroto Yamamoto, Hiroki Yamamoto, Ken Shinoda, Takafumi Omori, Aya Takemoto, Kunio Suzuki, Akiko Kitajo, Hitomi Kanamori, Sayumi Tsukada, Arisa Fukagawa,
Staff: Tomoko Ishibasi, Koji Kido, Yudai Yamamoto, Mayumi Echizen, Mamiyo Yoshida, Akiko Suzuki
Postgraduate Student: Hiroyuki Koinata, Eri Ikeda, Tomoko Ishibashi, Hiroto Yamamoto, Yudai Yamamoto, Zhaoh Shuo, Tianjiao Li, Tsuyoshi Kanma, Hirotsugu Ota

(1) Outline

A comprehensive understanding of research trends, research methods, and analysis of results by introducing the latest papers published in prestigious journals related to anesthesiology.

(2) Research

1) Discovering most effective ventilation methods for injury lungs.
2) Therapeutic mechanism of mesenchymal stem cell for lung injury (rat and mouse model)
3) Studies on the central nervous system effects of general anesthetics by human electrocorticogram and functional neuroimaging.
4) Studies on the mechanisms of cerebral pain processing and pain chronification by human functional magnetic resonance imaging and positron emission tomography.
5) Studies on the effects of protective one-lung ventilation on ventilatory mechanics.
6) Epidemiologic studies to identify incidence of, and risk factors for postoperative acute kidney injury in patients undergoing liver resection.

(3) Publications

[Original Articles]

1. Effectiveness of the regional anesthesia for open abdominal colectomy in patients with low pulmonary function 2017.02; 41(2); 157-160

2. Odaka M., Nagata M., Mizuno T., Uchida T., Takahashi H., Makita K., Arai H., Echizen H., Yasuhara M.. EFFECT OF CARDIOPULMONARY BYPASS SURGERY ON UNBOUND FRACTION OF CEFAZOLIN IN PLASMA CLINICAL PHARMACOLOGY & THERAPEUTICS. 2017.02; 101(S1); S81

Systemic Organ Regulation
espiration in a patient with esophagobronchial fistulae. Journal of Anesthesia Clinical Reports. 2017.05; 3(1); 31


6. Hiroyuki Kobinata, Eri Ikeda, Shuo Zhang, Tianjiao Li, Koshi Makita, Jiro Kurata. Disrupted offset analgesia distinguishes patients with chronic pain from healthy controls. Pain. 2017.10; 158(10); 1951-1959

[Books etc]


[Conference Activities & Talks]


4. Uchida T, Mitaka K. Treatment of Acute Kidney Injury: Atrial Natriuretic Peptide. The 64th Annual Meeting of the Japanese Society of Anesthesiologists 2017.06.08 Kobe, Hyogo, Japan

5. Jiro Kurata. Cerebral signatures of pain chronification. 10th International Symposium on Memory and Awareness in Anaesthesia 2017.06.21

6. Kido K, Ito H, Uchida T. Protective Effects of Coenzyme Q10 on Cytotoxicity of Propofol in Human-induced Pluripotent Stem Cell-derived Cardiomyocytes. Anesthesiology 2017 2017.10.23 Boston, MA, USA

7. Jiro Kurata. Neural mechanisms of offset analgesia. 7th Asian Pain Symposium 2017.10.27

[Awards & Honors]

1. Best Abstract Award First Prize, European Society for Anaesthesiologists, 2017.06

2. Best Abstract Award, The 51st Annual Meeting of the Japanese Society of Pain Clinicians, 2017.07
Cardiovascular Surgery

Professor: Hirokuni ARAI
Associate Professor: Tomohiro MIZUNO
Junior Associate Professor: Keiji OI
Assistant Professor: Masafumi YASHIMA, Tsuyoshi HACHIMARU, Eiki NAGAOKA (sabbatical leave from July), Hidehito KUROKI (from July), Tatsuki FUJIWARA, Masashi TAKESHITA
Graduate Student: Tatsuki FUJIWARA, Hidehito KUROKI, Dai TASAKI, Kenji SAKAI, Ryoji KINOSHITA (from April)
Hospital Staff: 4

Department of Advanced Surgical Technology Research and Development
Associate Professor: Katsuhiro OUCHI

(1) Research

1) Developing safe and high quality surgical strategy in coronary artery bypass grafting surgery.

2) Developing new surgical technique for ischemic heart disease

3) Developing new surgical technique for beating mitral valve surgery

4) Clinical research for artificial heart

5) Research for new regenerative therapy for failing heart to recover cardiac function

(2) Education

Cardiovascular Surgery is a branch of surgery which deals with heart and vascular (mainly aortic) disease. Main objective of our department in the graduate course is to provide medical students an opportunity to study surgical anatomy, pathophysiology, pharmacology, and advanced surgical treatment for heart and aortic disease. Students are also taught basic research for the surgical treatment for heart and aortic disease. We also provide clinical training program for young surgeon to obtain Japanese cardiovascular surgical board.

(3) Clinical Performances

Our department provides well-advanced surgical treatment of heart and aortic surgery. We perform off-pump coronary artery bypass grafting for more than 90% of patients with coronary artery disease, mitral valve repair, not valve replacement, for almost all patients with mitral valve regurgitation. New surgical reconstruction technique is provided for patients with functional mitral regurgitation due to severe heart failure. For elderly patients, we offer minimally invasive aortic surgery such as thoracic endovascular aortic repair (TEVAR) and hybrid aortic surgery without cardiopulmonary bypass for aortic arch and thoracoabdominal aortic disease.
Systemic Organ Regulation

(4) Publications

[Original Articles]

1. Ryoji Kinoshita, MD, Tomohiro Mizuno, MD, PhD, Tsuyoshi Hachimaru, MD, Keiji Oi, MD, PhD, Masafumi Yashima, MD, Eiki Nagaoka, MD, PhD, Tatsuki Fujiwara, MD, Hidehito Kuroki, MD, Dai Tasaki, MD, and Hirokuni Arai, MD, PhD. Antineutrophil Cytoplasmic Antibody—Associated Multiple Giant Saccular Aortic Aneurysms The Annals of Thoracic Surgery. 2017.02; 103(2); e153-e155


[Conference Activities & Talks]

1. Arai H. Seeing for Optimum Exposure in OPCAB. Tentacles for CABG 2017.03.22 Seoul, Korea


8. Arai H. How to improve outcomes of CABG. Master of Surgery 2017 2017.03.31 Bangkok, Thailand


12. Ryoji Kinoshita. Early to Mid-Term Results of Mitral Valve Repair with Autologous Pericardial Patch for Active Infective Endocarditis with Extensive Leaflet Destruction. AATS Mitral Conclave 2017 2017.04.27 New York, USA


20. Arai H. GEA: Which Targets? Free Graft or In-Situ?. 2017 International Coronary Congress 2017.08.18 New York, USA


23. Arai H. High Frequency Ultrasound Interrogation of Anastomoses. 2017 International Coronary Congress 2017.08.19 New York, USA


25. Arai H. Innovative Approach for treatment of FMR. 4th Heart Care Heart International Symposium (Pre-congress) 2017.08.24 Bangkok, Thailand
26. Arai H. Pathology Oriented Resection in MV Repair: Mount Fuji’s Technique. 4th Heart Care Heart International Symposium 2017.08.25 Bangkok, Thailand

27. Arai H. B. Papillary Muscle Relocation. 4th Heart Care Heart International Symposium 2017.08.26 Bangkok, Thailand


29. Arai H. Non-invasive quantification of blood flow in epicardial coronary arteries, coronary artery graft and anastomosis – Can this change graft patency in minimally invasive CABG?. 2nd Annual Conference of Society of Minimally Invasive Cardiovascular and Thoracic Surgeons of India 2017.09.10 Jaipur, India

30. Arai H. (Moderator) SESSION XIII - CORONARY SURGERY PART II. The Euro-Asian Bridge Society 13th International Meeting on Cardiac Surgery 2017.09.22 Iasi, Romania


34. Arai H. A new pathology oriented repair technique for posterior mitral leaflet “Mt. Fuji Repair Technique” (video presentation in AATS Mitral Conclave 2017). The Euro-Asian Bridge Society 13th International Meeting on Cardiac Surgery 2017.09.23 Iasi, Romania

35. Arai H. OPCAB Technique using multi-suction heart positioner “TENTACLESTM”. The Euro-Asian Bridge Society 13th International Meeting on Cardiac Surgery 2017.09.23 Iasi, Romania

36. Arai H. (Moderator) SESSION XVII – VIDEO PRESENTATION. The Euro-Asian Bridge Society 13th International Meeting on Cardiac Surgery 2017.09.23 Iasi, Romania


40. Arai H. Intraoperative Ultrasonic Quality Assessment and Surgical Guidance to Improve Outcomes after CABG. The 16th Annual Meeting of Taiwan Association of Thoracic & Cardiovascular Surgery 2017.10.28 Taipei, Taiwan


42. Arai H. Current Trends in CABG in Japan. 23rd PATACSI Annual Convention 2017.12.02 Manila, Philippine

43. Arai H.. Intra-operative Ultrasonic Quality Assessment and Surgical Guidance to Improve CABG Outcomes. 23rd PATACSI Annual Convention 2017.12.02 Manila, Philippine
Nephrology

Professor:
Shinichi UCHIDA
Tatemitsu RAI (Dept. of Nephrology and Regional Medicine (Ibaraki))

Associate Professor:
Tomokazu OKADO (Dept. of Blood Purification)
Eisei SOHARA

Junior Associate Professor:
Shotaro NAITO

Assistant Professor:
Naohiro NOMURA
Soichiro IMORI (Dept. of Blood Purification)
Takayasu MORI (Dept. of Blood Purification)
Kiyoshi ISOBE (Dept. of Nephrology and Regional Medicine (Ibaraki))
Fumiaki ANDO (Project Assistant Professor)

Graduate Student:
Yohei ARAI, Yuri KASAGI, Emi SASAKI
Shintaro MANDAI, Sayaka YOSHIDA, Wang Yuan Long
Hiroaki KIKUCHI, Wakana SHODA, Hiroko HASHIMOTO
Takuya FUJIMARU, Taisuke FURUSHO, Yoshiaki MATSUURA
Naohiro TAKAHASHI, Tamami FUJIKI

Hospital Staff:
Seiko ISHIKAWA, Yuto TOMA, Noriyuki TOSHIMA
Takashi MIYAZAKI, Saki KUBO
Shunsuke INABA, Shota SAKASHITA, Takanori MIYAZAKI

Technician:
Chieko IIJIMA, Motoko CHIGA

Secretary:
Asa MURANO, Yukiko ITO

(1) Outline

The policy of the Department of Nephrology is to accomplish trustworthy medicine and to educate excellent academic scientists and nephrologists. Our department is one of the initial institutes that started the hemodialysis therapy in Japan, and thus, has a long experience of clinical practice of kidney diseases. We are now investigating pathophysiological mechanisms of various kidney diseases including genetic renal diseases. Furthermore, we are taking a proactive stance in developing innovative therapy. We hope new young scientists and physicians join us for future science and nephrology.

(2) Research

The theme of our study is "to investigate the mechanisms of maintaining blood pressure and body fluids homeostasis regulated by the kidney and to clear the pathophysiology caused by their failure, and to develop novel strategies for their treatment." This would lead to the development of kidney disease therapy itself and
would also lead to studying for multiple organ failure caused by chronic kidney disease (CKD).

In 2017, our 14 presentations, including 2 oral presentations, were adopted in the annual meeting of American society of nephrology (ASN KIDNEY WEEK). Moreover, our research manuscripts were published in several high impact journals such as eBioMedicine, open access Elsevier journal supported by Cell Press and The Lancet, Kidney International (IF: 7.68), Molecular and Cellular Biology (IF: 4.4), or Scientific Reports (IF: 4.3). We published 26 reports and four of them were presented in "press release".

In addition to them, a lot of our members have got prizes in various medical meetings regardless of whether they are in or out of the country. Further, comprehensive diagnosis of inherited kidney diseases using next generation sequencer (NGS) and clinical studies on genome information are now on track and is contributing to various genetic diagnosis of many patients. Genetic diagnosis were carried out for more than 200 cases a year. CKD-ROUTE study, which is the clinical cohort study with 1,000 subjects we take the initiative have been finished the observation period of 3 years, which enabled us to publish 7 clinical research papers (3 in Clin Exp Nephrol., 1 inNephrology and others).

(3) Education

"Undergraduate education"
(Systematic lecture)

For third grade medical students, we are conducting lectures organized in a three-week ‘block form’ together with urology and pathology sections. Under the name of "Body Fluid Regulation and Urology" Block, the students can learn intensively about kidney and urologic diseases during a period of three weeks. In this lecture, we incorporate PBL (Problem-Based Learning) lectures and lectures held by actual patients, so that the students will be able to study independently and bi-directionally.

(Project semester)

We accept several students every year in the project semester, in which they are expected to participate in the forefront research with the assistance of graduate students.

(Clinical clerkship)

For fifth grade students who finished the systematic lectures and project semester, we provide the Pre-Clinical Clerkship (PCC) lectures for ten weeks, which are more practical and comprehensive than that the previous lectures held in the classroom. After PCC, the students will undergo Clinical Clerkship (CC), in which they will actually take charge of patients in the hospital ward, and study about kidney diseases while developing their clinical skills. They will be in charge of one new inpatient each week, make a presentation about their patient at the medical conference every week, and are expected to learn about the pathophysiology of various kidney diseases in depth.

"Postgraduate education"

After the two-year initial training after graduation, postgraduate doctors will be engaged in clinical training as nephrologists either in the University Hospital or affiliated hospitals as senior trainees, and during this period, we teach them so that they can be aware about unsolved clinical problems. We are planning to bring them up as “academic doctors”.

Research activities in the graduate school are quite active, and by carrying out the state-of-the-art research as described above, we are training doctors to be able to excel in both basic and clinical works.

(4) Clinical Services & Other Works

Our department is one of the initial institutes that started the hemodialysis therapy in Japan, and thus, has a long experience of clinical practice of kidney diseases. We have close coordination with our 19 affiliated hospitals, and are performing CKD-ROUTE clinical cohort study stated above in cooperation with 15 hospitals of the 19, which enabled us to publish 7 clinical research papers. We continue to make an effort to reveal the pathophysiology of CKD patients. We have been actively adopting the “educational admission” for CKD patients and it has been showing the significant inhibitory effect on progression of kidney disease. For end-stage renal disease patients, vascular access surgery, peritoneal dialysis-related surgery, and induction of dialysis are consistently carried out in our department.

Our hemopurification center is one of the biggest institutions among 42 hospitals belonging to national uni-
versities. In 2017, the number of newly started dialysis patients was in 1st pace, the total number of blood purifications, hemodialysis, and plasma exchanges was in 2nd place. Furthermore, we developed diagnostic panel for comprehensive genetic diagnosis for hereditary kidney diseases like nephrogenic diabetes insipidus, pseudohypoaldosteronism type II, Liddle syndrome, and Polycystic kidney diseases. Currently, we receive requests of genetic tests from all over the country. Genetic screening using next-generation sequencing technology enables definite diagnosis for rare hereditary diseases.

(5) Publications

[Original Articles]


2. Yui Naofumi, Sasaki Sei, Uchida Shinichii. Aquaporin-2 Ser-261 phosphorylation is regulated in combination with Ser-256 and Ser-269 phosphorylation. Biochem Biophys Res Commun. 2017.01; 482(4); 524-529

3. Nagata Soichiro, Ikegaya Naoki, Ogino Shuhei, Uchida Shinichii, Itaya Mikiko, Momita Aoi, Shinozaki Shingo, Ohura Masaharu, Kuriki Ken, Kono Satoshi, Miyajima Hiroaki, Hishida Akira. The Resection of Thyroid Cancer Was Associated with the Resolution of Hyporesponsiveness to an Erythropoiesis-stimulating Agent in a Hemodialysis Patient with Aceroembrinemia. Intern Med. 2017.01; 56(7); 805-810


5. Mori Takayasu, Hosomichi Kazuyoshi, Chiga Motoko, Mandai Shintaro, Nakaoka Hirofumi, Sohara Eisei, Okado Tomokazu, Rai Tatemitsu, Sasaki Sei, Inoue Ituro, Uchida Shinichii. Comprehensive genetic testing approach for major inherited kidney diseases, using next-generation sequencing with a custom panel. Clin Exp Nephrol. 2017.02; 21(1); 63-75


11. Emi Sasaki, Koichiro Susa, Takayasu Mori, Kiyoshi Isobe, Yuuya Araki, Yuichi Inoue, Yuki Yoshizaki, Fumiaki Ando, Yutaro Mori, Shintaro Mandai, Moko Zeniya, Daiei Takahashi, Naohiro Nomura, Tatemitsu Rai, Shinichi Uchida, Eisei Sohara. KLHL3 Knockout Mice Reveal the Physiological Role of KLHL3 and the Pathophysiology of Pseudohypoaldosteronism Type II Caused by Mutant KLHL3. Mol. Cell. Biol. 2017.04; 37(7);


26. Mishima Eikan, Mori Takayas, Sohara Eisei, Uchida Shinich, Abe Takaaki, Ito Sadayoshi. Inherited, not acquired, Gitelman syndrome in a patient with Sjogren’s syndrome: importance of genetic testing to distinguish the two forms. CEN Case Rep. 2017.11; 6(2); 180-184


[Misc]

2. Management in Hyperkalemia 2017.11; 6(5); 376-379

[Conference Activities & Talks]


3. Sayaka Yoshida, Eisei Sohara, Yuya Araki, Yuri Kasagi, Emi Sasaki, Koichiro Susa, Takayasu Mori, Yuichi Inoue, Kiyoshi Isobe, Tatemitsu Rai, Shinichi Uchida. Decreased protein expression of KLHL3 is involved in the pathogenesis of PHAII caused by CUL3 mutation in vivo.. The 60th Annual Meeting Japanese Society of Nephrology 2017.05.26 Sendai


5. Yuri Kasagi, Eisei Sohara, Tomomi Aida, Daiei Takahashi, Hidenori Nishida, Naohiro Nomura, Moko Zeniya, Takayasu Mori, Emi Sasaki, Fumiaki Ando, Tatemitsu Rai, Shinichi Uchida. KLHL2 promotes WNK4 degradation in mouse kidneys.. The 60th Annual Meeting of the Japanese Society of Nephrology 2017.05.28
6. Sohara Eisei. WNK kinase signalling to cation chloride transporters. Symposium, INTERNATIONAL UNION OF PHYSIOLOGICAL SCIENCE, 38th World Congress 2017.08.05 Rio de Janeiro, Brazil


9. Takayasu Mori, Motoko Chiga, Takuya Fujimaru, Shintaro Mandai, Shotaro Watanabe, Yasuhisa Nakamura, Takehiro Morishita, Osamu Uemura, Eisei Sohara, Tomokazu Okado, Shinichi Uchida, Kiyohide Fushimi and Tatemitsu Rai. We propose single heterozygous mutation in ATP6V0A4 as novel genetic cause of dRTA. The 50th Annual Meeting of the American Society of Nephrology 2017.11.02 New Orleans, LA.

10. Shinichi Uchida. Translational researches in the field of water and electrolyte disorders. The annual meeting of the American Society of Nephrology 2017.11.02 New Orleans, USA


15. Daiei Takahashi, Shinichi Uchida. WNK4 Deletion Inhibits Adipogenesis In Vitro and In Vivo. The 50th Annual Meeting of the American Society of Nephrology 2017.11.04

16. Yohei Arai, Shinichi Uchida et al.. A High Salt Diet Suppressed CXCL9 and CXCL10 in Proximal Tubules through the IFN γ-JAK1-STAT1 Signaling Pathway. The 50th Annual Meeting of the American Society of Nephrology 2017.11.04

17. Sayaka Yoshida, Yuya Araki, Takayasu Mori, Emi Sasaki, Yuri Kasagi, Kiyoshi Isobe, Koichiro Susa, Yuichi Inoue, Tatemitsu Rai, Shinichi Uchida, Eisei Sohara.. Decreased protein expression of KLHL3 is involved in the pathogenesis of PHAII caused by CUL3 mutation in vivo.. The 51th Annual Meeting of American Society of Nephrology. 2017.11.04 New Orleans, LA
Comprehensive Reproductive Medicine

Professor : Naoyuki MIYASAKA
Associate Professor : Satoshi OBAYASHI
Project Professor : Masakazu TERAUCHI
Junior Associate Professor : Naoyuki YOSHIKI,Kimio WAKANA
Project Junior Associate Professor: Tomonori ISHIKAWA,Makiko EGAWA
Assistant Professor : Yuki IWAHARA,Noriko OSHIMA-SUDO, Shiro HIRAMITSU, Nobuyuki KIDERA,
Takashi NAKASUJI,kotoi TSURANE, Asuka HIROSE,Reiko NAKAMURA
Project Assistant Professor : Ayako FUDONO,kazuaki SAITO
Hospital Staff : hiroshi YOMOGITA,Noriko KUROSAKA,Kiyoko ISHIZUKA
Graduate Student :Reiko SHIRAI,Kiyotaka KAWAI,Kazuki SAITO, Akiko FURUSAWA,Takuto MATSUURA,
Rie OI,Takayuki TATSUMI,Masaki SEKIGUCHI,Tamami ODAI,Kenta TAKAHASHI,
Mayumi KOBAYASHI,AsamiHIRATA,Shiho YAUCHI, Misako IWATA,
Nobuyuki KIDERA, Ayako FUDONO, Misaki MASUYAMA

( 1 ) Research

Research divisions :
1) Research in physiology, endocrinology and metabolism in the reproductive medicine
2) Research of female physical and mental change with aging
3) Pathophysiological examination of gynecological malignant tumor
4) Clinical research and basic research in perinatal medicine

Available scientific procedures :
1, Cell culture technique of ovarian granulosa cells, endometrial cells, malignant cells, osteoblast and so on.
2, Determination of intracellular calcium (by Fura 2 method and patch clump )
3, Measurement of intra-cellular IP3
4, Hormonal assay in plasma, urine, follicular fluid (RIA & EIA)
5, Immunohistochemistry with ABC method
6, Analysis of micro-structure with electrical microscopy
7, Determination with molecular biological technique.
8, Physiological determination with isometric tension change
9, Determination of cerebral blood flow with MRI in cerebral infarction
10, Analysis of protein expression with flow cytometry

( 2 ) Education

CRM (OB/GY) department has an obligation to offer medical services, education, research as one of the clinical departments in national graduate school, and has duty on making a mutual cooperation with local gynecological institutions.
Our main objectives are
1, Investigation for a new progress in treatment technique 
2, Acquisition of medical knowledge and procedure 
3, Providing systemic lecture about women’s physiological and pathological change during adolescence through senescence.

Aims of research works are focusing on reproductive medicine, perinatal medicine and oncology. Educational intention in medical doctor course and nursing course includes systemic lectures, clinical conferences and special lecture by many extramural speakers. During Bed-Side Learning period, students should be treated as one of medical stuffs, attend all of deliveries and be present at gynecological procedure. Several OB/GY institutions will be provided as an extramural drills.

(3) Clinical Performances

For intractable sterilization, satisfactory results are obtained with endoscopic examinations and IVF-ET methods. Health care unit for menopausal women was established, where inspections for atherosclerosis, osteoporosis (DEXA), autonomic nervous system are performed, and postmenopausal managements are provided including HRT, mental care and counseling.

After construction of LDR(labor, delivery, recovery) unit, cure for complicated pregnancies is now carried out, and cases of deliveries are rising now.

Malignant gynecological tumor is also an important aim of this department, for which surgery, chemotherapy and radiotherapy with complete cure are applied to patients. For benign tumor and endometriosis, laparoscopic operations are aggressively performed, whose number is now increasing.

(4) Publications

[Original Articles]


2. T Tatsumi, S C Jwa, A Kuwahara, M Irahara, T Kubota, H Saito. No increased risk of major congenital anomalies or adverse pregnancy or neonatal outcomes following letrozole use in assisted reproductive technology. Hum. Reprod.. 2017.01; 32(1); 125-132


15. Fusegi Atsushi, Nakamura Reiko, Oshima Noriko, Ishikawa Tomonori, Wakana Kimio, Yoshiki Naoyuki, Miyasaka Naoyuki. Port site recurrence and diffuse subcutaneous metastasis of the early stage ovarian cancer after laparoscopic surgery Japan Society of Gynecologic and Obstetric Endoscopy and Minimally Invasive Therapy. 2017.08; 33(Suppl.I); 1280


18. Rina Komazaki, Sayaka Katagiri, Hirokazu Takahashi, Shogo Maekawa, Takahiko Shibata, Yasuo Takeuchi, Yoichiro Kitajima, Anri Ohtsu, Sayuri Udagawa, Naoki Sasaki, Kazuki Watanabe, Noriko Sato, Naoyuki Miyasaka, Yoichiro Eguchi, Keizo Anzai, Yuichi Izumi. Periodontal pathogenic bacteria, Aggregatibacter actinomycetemcomitans affect non-alcoholic fatty liver disease by altering gut microbiota and glucose metabolism Scientific Reports. 2017.10;


22. Oshima N., Nakamura R., Furusawa A., Toba M., Wakana K., Miyasaka N.. RETROSPECTIVE ANALYSIS OF RADICAL RADIOTHERAPY FOR ENDOMETRIAL CANCER INTERNATIONAL JOURNAL OF GYNECOLOGICAL CANCER. 2017.11; 27; 1175


[Misc]
1. Naoyuki Yoshiki. Review of transvaginal natural orifice transluminal endoscopic surgery in gynecology. Gynecol Minim Invasive Ther. 2017.02; 6(1); 1-5

[Conference Activities & Talks]
1. Kimio Wakana, Naoyuki Miyasaka. Endometrial cancer treatment up-to-date. Shoheizaka radiology 2017.03.17


3. Miyuki Nonaka, Tomonori Ishikawa, Sachi Murakata, Nobuyuki Kidera, Atsushi Yamamoto, Yuki Iwashara, Naoyuki Miyasaka. Piezo ICSI improves fertilization rate and good-quality day3 embryo as compared with conventional ICSI. 7th Congress of the Asia Pacific Initiative on Reproduction (ASPIRE 2017) 2017.04.01


5. Miyuki Nonaka, Tomonori Ishikawa, Sachi Murakata, Kenichiro Hiraoka, Atsushi Yamamoto, Yuki Iwashara, Naoyuki Miyasaka. PIEZO-ICSI IMPROVES FERTILIZATION RATE AS COMPARED WITH CONVENTIONAL-ICSI. The 7th Congress of the Asia Pacific Initiative on Reproduction 2017.04.01 Kuala Lumpur


8. Asuka Hirose, Masakazu Terauchi, Miho Hirano, Mihoko Akiyoshi, Kiyoko Kato, Naoyuki Miyasaka. HIGHER INTAKE OF CRYPTOXANTHIN IS RELATED TO LOW BODY MASS INDEX AND BODY FAT IN JAPANESE MIDDLE-AGED WOMEN. 6th Scientific Meeting of the Asia Pacific Menopause Federation 2017.04.22 Singapore


12. Saito K, Matsuzaki T, Ogata T, Kubota T, Irahara M, Fukami M. Multiple androgen biosynthesis pathways are operating in women with polycystic ovary syndrome. 2017 ACOG Annual Clinical and Scientific Meeting 2017.05.07 San Diego


14. Masakazu Terauchi, Asuka Hirose, Mihoko Akiyoshi, Kiyoko Kato, Naoyuki Miyasaka. Muscle and joint pains in middle-aged women are associated with insomnia and low grip strength. 11th European Congress on Menopause and Andropause 2017.05.24 Amsterdam, Netherlands


19. Takashi Nakasui, Tomonori Ishikawa, Yasumasa Segal, Naoyuki Miyasaka. Laparoscopic surgery of peritoneal inclusion cyst for ovum pick up. 18th APAGE Annual Congress 2017.09.07 Okayama

20. Eri Inoue, Re OI, Takahiro Yamashita, et al. Fetal right aortic arch can be screened with three vessels view in the second or third trimester ultrasound screening. International Society of Ultrasound in Obstetrics and Gynecology 2017.09.17 Vien, Austria


23. K. Hiraoka, Y. Otsuka, T. Ishikawa, K. Kawai, T. Harada. Effect the sperm selection magnification (400x vs 1,200x) on fertilization results and embryo development in human Piezo-ICSI. ASRM 73rd Scientific Congress 2017.10.28 San Antonio


[Awards & Honors]
1. 6th Scientific Meeting of the Asia Pacific Menopause Federation Best Oral Award (Masakazu Terauchi), Asia Pacific Menopause Federation, 2017.04
**Urology**

**Professor and Chairman:** Yasuhisa Fujii  
**Associate Professor:** Kazutaka Saito  
**Junior Associate Professor:** Yoh Matsuoka, Junichiro Ishioka (Department of Insured Medical Care Management), Minato Yokoyama  
**Assistant Professor:** Soichiro Yoshida, Toshiki Kijima, Masaya Ito (- March), Masaharu Inoue (- May), Hajime Tanaka (April - September), Yosuke Yasuda (June -), Sho Uehara (October -)  
**Hospital Staff:** Hajime Tanaka (-March), Takayuki Nakayama (-March), Yosuke Yasuda (- May), Sho Uehara (April - September), Yuma Waseda, Shohei Fukuda (October -), Masahiro Toide (October -), Shugo Yajima, Keita Izumi (April - June), Takashi Tamiya (April - September), Kohei Chino (April - September), Takahiko Soma (August -), Yuichi Fukuda (August -)  
**Resident:** Takahiko Soma (- July), Yuichi Fukuda (- July)  
**Graduate Student:** Saori Araki, Yosuke Yasuda, Sho Uehara, Yuma Waseda, Hiroshi Fukushima, Shingo Moriyama  
**Project professor:** Kazunori Kihara

(1) **Outline**

Our mission is to establish and provide the best urological care to all patients in the super aging society which all over the world is facing.

Besides offering urological practices of the international standard, we are making a continuous effort to improve daily practices based on the evidences of the clinical and translational research which we commit under the concept of "Bed to Bench, Feedback to Bed".

To realize the mission, we have been developing various procedures.

1. Gasless Single-Port RoboSurgeon urological surgery which can be applied to most of patients with urological tumors is a safe and educational minimally invasive surgery satisfying no CO2 gas insufflation, no peritoneal injury, no multiple ports, and no high cost.
2. Bladder sparing treatment consisting of transurethral resection of bladder tumor, low-dose chemoradiotherapy and Gasless Single-Port RoboSurgeon partial cystectomy with pelvic lymph node dissection can preserve urinary and sexual function without compromising curability in carefully selected patients with muscle-invasive bladder cancer for which radical cystectomy with urinary diversion is the standard treatment.
4. Focal brachytherapy for localized prostate cancer precisely diagnosed by MRI and meticulous biopsy can provide cure without deteriorating urinary and sexual function.

The continuous commitment to clinical and translational research is reflected to publications in international journals, presentations at international meetings and awards.

(2) **Research**

Clinical Research  
1) Innovation and establishment of a minimally invasive surgery, Gasless Single-Port RoboSurgeon urological surgery
Systemic Organ Regulation

2) Development of optimal MRI-ultrasonography fusion prostate needle biopsy
3) Sequential combination therapy to prolong survival of advanced prostate cancer patients
5) Development and establishment of Gasless Single-Port RoboSurgeon clumpless partial nephrectomy against kidney cancer
6) Development and establishment of focal brachytherapy against localized prostate cancer
7) Sequential combination therapy to prolong survival of advanced kidney cancer patients, starting with immunotherapy combined with multiple molecular targeted agents
8) Application of diffusion-weighted MRI to diagnosis, assessment of therapeutic effects and monitoring of relapse in urological cancer
9) Application of serum C-reactive protein as a prognostic biomarker of urological malignancies and as a marker for surgical invasiveness
10) Development of prognostic prediction model for non-muscle-invasive bladder cancer

Translational Research
1) Development of differentiation-inducing therapy against hormone-resistant prostate carcinomas
2) Investigation on molecular mechanisms, in particular deregulation of the NO system, underlying voiding and erectile dysfunction to develop rational therapy
3) Overcoming therapeutic resistance to chemo- and/or radiotherapy against urological malignancies using novel molecular targeted agents
4) Investigation on functional roles of p63 protein in urothelial carcinomas

(3) Lectures & Courses

Our top priority is to establish the best urological practice in the super aging society which all over the world is facing. We are committed to offering educational programs to facilitate the development of outstanding academic urologists of the next generation. We believe that one of our missions is to educate students, residents and fellows in the art and science of urology and thereby to train the future leaders in the field. The continuous commitment to clinical and translational research is reflected to publications in international journals, presentations at international meetings and awards.

(4) Clinical Performances

Our mission is to provide the best urological care to all patients. Besides offering urological practices of the international standard, we are making a continuous effort to improve daily practices. The Gasless Single-Port RoboSurgeon urological surgery, which we have innovated its concept and developed surgical techniques specific to all urological organs, has been officially approved as medical services provided by the Japanese Governmental Health Insurance System in April 2008. These minimally invasive surgical techniques can be fundamentally applied to all patients having urological malignancies, even those having locally advanced disease and previous histories of abdominal surgery.

(5) Publications

[Original Articles]


5. Soichiro Yoshida, Tsuneo Fukuyo, Kazutaka Saito, Kazunori Kihara, Yasuhisa Fujii. Real-time three-dimensional image angle rectification to improve hand-eye coordination in single-port laparoendoscopic surgery. Int. J. Urol.. 2017.08; 24(8); 639-640


[Misc]
1. Soichiro Yoshida, Taro Takahara, Thomas C Kwee, Yuma Waseda, Shuichiro Kobayashi, Yasuhisa Fujii. DWI as an Imaging Biomarker for Bladder Cancer. AJR Am J Roentgenol. 2017.06; 208(6); 1218-1228


[Conference Activities & Talks]
1. Izumi Keita, Saito Kazutaka, Nakayama Takayuki, Fukuda Shohei, Fukushima Hiroshi, Uehara Sho, Koga Fumitaka, Yonese Junji, Kageyama Yukio, Kihara Kazunori, Fujii Yasuhisa. Contact with renal sinus is a significant risk factor for metastasis in pT1 clear cell renal cell carcinoma. . 32nd Annual EAU Congress 2017.03.26 London, UK


7. Yosuke Yasuda1, Kazutaka Saito1, Naoko Kawamura1, Sho Uehara2, Takeshi Yuasa2, Minato Yokoyama1, Junichiro Ishioka1, Yoh Matsuoka1, Shinya Yamamoto2, Shunji Takahashi3, Tetsuo Okuno4, Junji Yonese2, Kazunori Kihara1 and Yasuhisa Fujii1. EARLY RESPONSE AT FOUR WEEKS OF C-REACTIVE PROTEIN PREDICTS SURVIVAL IN PATIENTS WITH METASTATIC RENAL CELL CARCINOMA TREATED WITH TYROSINE KINASE INHIBITORS. 2017.05.12 Boston


10. Yuma Waseda, Kazutaka Saito, Masaharu Inoue, Masaya Ito, Toshiki Kijima, Soichiro Yoshida, Minato Yokoyama, Junichiro Ishioka, Yoh Matsuoka, Kazunori Kihara, Yasuhisa Fujii. Predictive ability of renal cortex enhancement in dynamic CT for residual renal function after nephroureterectomy: Comparative study with renography.. AUA Annual Meeting 2017 2017.05.15 Boston


12. Takayuki Nakayama, Toshiki Kijima, Soichiro Yoshida, Fumitaka Koga, Kazunori Kihara and Yasuhisa Fujii. Zoledronic acid sensitizes castration-resistant prostate cancer cells to radiotherapy and chemotherapy by downregulating STAT1. AUA Annual Meeting 2017 2017.05.15
Gastrointestinal Surgery

Professor
Yusuke Kinugasa
Project Professor
Masahiro TSUBAKI
Associate Professor
Masanichi YASHUNO, Mikito INOKUCHI, Yasuaki NAKAJIMA
Junior Associate Professor
Kenro KAWADA, Takuya OKADA
Assistant Professor
Yutaka TOKAIRIN, Akifumi KIKUCHI, Toshiro TANIOKA
Akihiro HOSHINO, Shūnichi YAMAUCHI
Graduate Student
Yasunori SOMENO, Taïri RYOTOKUJI, Shunsuke OTA, Masatoshi NAKAGAWA, Masafumi OKUDA, Yuichiro KUME, Yutaka NAKAJIMA, Taïchi OGOU, Michiyo TOKURA, Marie HANAOKA, Toshihiro MATSUI, Tomoki MIURA, Kazuya YAMAGUCHI, Keisuke OKUNO, Kentaro GOKITA, Ryota SEKI, Fukuichiro ORITA, Yudai KAWAMURA, Tomiyuki MIURA, Kazuya YAMAGUCHI, Megumi SASAKI, Ayumi TAKAOKA, Emi KANEMOTO, Yuriko MATSUMIYA, Rei GHO, Mora ANDRES, Yuya UMEBAYASHI

(1) Research
1) Development of esophageal surgery.
2) Development of gastric surgery.
3) Development of colorectal surgery.

(2) Education

The history of the department started as both the Department of Esophageal and General Surgery and the Department of Surgical Oncology of TMDU, and many surgeons and researchers in various specialties have gathered and have been keeping a high level of activities. Our main purposes of education are to make the post-graduate physicians grown up to excellent surgeons and to contribute in development of medical/surgical sciences. Surgeons with high-level medical knowledge and techniques are expected to grow up in this department. Moreover, making surgeons with matured humanity is one of the purposes. The department has a peaceful atmosphere and stands for active work in solving difficult problems.

(3) Clinical Performances

Main clinical services are diagnosis and treatment for esophageal, gastric and colorectal diseases. Post-graduate students learn and study general surgery and sub-speciality, e.g. esophageal surgery, gastric surgery and colorectal surgery. The territory of clinics is wide and the department provides a full spectrum of standard and special technologies such as minimally invasive surgery and extended radical surgery for malignancies.
**Systemic Organ Regulation**

(4) **Publications**

**[Original Articles]**


4. Inokuchi M, Murase H, Otsuki S, Kawano T, Kojima K. Different clinical significance of FGFR1-4 expression between diffuse-type and intestinal-type gastric cancer World J Surg Oncol. 2017;01; 15(1);


18. Nakajima Y, Kawada K, Tokairin Y, Hoshino A, Okada T, Kawano T.. A Pilot Trial of S-1 and Paclitaxel in Unresectable or Postoperative Recurrent Esophageal Squamous Cell Carcinoma Pretreated by Fluorouracil, Cisplatin, and Docetaxel Chemotherapy Dig Surg (Epub ahead of print). 2017.05; 35(2); 131-137


20. Mikito Inokuchi, Masatoshi Nakagawa, Toshiro Tanioka, Keisuke Okuno1, Kentaro Gokita, Kazuyuki Kojima. Long- and short-term outcomes of laparoscopic gastrectomy versus open gastrectomy in patients with clinically and pathological locally advanced gastric cancer: a propensity score matching analysis Surgical Endoscopy. 2017.07; published online;


[Conference Activities & Talks]


5. Toshiro Tanioka, Keisuke Okuno, Kentaro Gokita, Mikito Inokuchi, Kazuyuki Kojima. Effect of postoperative complications on the long-term survival of patients with gastric cancer. 12th International Gastric Cancer Congress 2017.04.21


7. Masatoshi Nakagawai, Mikito Inokuchi, Sho Otuki, Norihito Ogawa, Toshiro Tanioka, Kazuyuki Kojima. Is laparoscopic approach an effective tool for total gastrectomy to obese patients. 12th International Gastric Cancer Congress 2017.04.22

8. Kenro Kawada. Observation of the pharynx to the cervical esophagus using transnasal endoscopy with image-enhanced endoscopy. 11th GLOBAL GASTROENTEROLOGISTS MEETING 2017.06.12 Rome(Italy)


11. Kenro Kawada, Yasuaki Nakajima, Yutaka Tokairin, Akihiro Hoshino, Takuya Okada, Yudai Kawamura. Observation of the oral cavity of patients with esophageal cancer using trans-nasal esophagogastroduodenoscopy with image enhanced endoscopy.. OESO 14th World Conference, CICG (International Conference center of Geneva) 2017.09.03 Geneva(Switzerland)


[Awards & Honors]
1. 2017 Albert Nelson Marquis Lifetime Achievement Award (Kenro Kawada), 2017.04
Thoracic Surgery

Professor Kenichi Okubo
Junior Associate Professor Hironori Ishibashi
Assistant Professor Masashi Kobayashi
Hospital assistant professor Chihiro Takasaki
Graduate Student Sachiko Imai
Graduate Student Akiko Sugawara
Graduate Student Ken Takahashi
Graduate Student Katsutoshi Seto
Graduate Student Ryo Wakejima
Graduate Student Syunichibi Baba
Graduate Student Yasuhiro Nakashima
Graduate Student Ayaka Asakawa
Graduate Student Yuya Ishikawa

(1) Outline

Department of Thoracic Surgery deal with clinical management, basic and clinical research, and education of thoracic surgery, which includes surgical diagnosis and treatment of respiratory diseases.

(2) Research

- Minimally invasive surgery for lung cancer
- Multimodal treatments for thoracic malignancies
- Surgery for metastatic lung tumors
- Clinico-pathological studies on lung cancer

(3) Education

Department of Thoracic Surgery has a mission to educate medical post-graduates for expert thoracic surgeons. Thoracic surgeon requires the Board of Surgery and the Board of Thoracic Surgery to perform clinical cares as a specialist. We provide clinical specialty course for thoracic surgery and graduate course for thoracic surgery, and support to obtain the boards.

(4) Clinical Services & Other Works

Out-patient Clinic: Tuesday, Thursday, Friday
Operative Day: Monday, Wednesday, Thursday, Friday
Clinical Conference: Monday
Chest Conference: Monday
Clinico-pathological Conference: Wednesday
Medical Round: every morning
Professor’s Round: Tuesday
Journal Club: Tuesday (every other week)
Systemic Organ Regulation

Mortality & Morbidity Conference: Tuesday (every other week)
Lab Meeting: Tuesday (monthly)
Scientific Meeting: Japan Surgical Society, Japanese Association for Chest Surgery, Japanese Association for Thoracic Surgery, Japan Lung Cancer Society, Japan Society for Respiratory Endoscopy

(5) Clinical Performances

Thoracic Surgery deal with surgical treatment for lung, mediastinum, pleura and chest wall. We provide high-grade medical care as a university hospital. We offer less invasive surgery for early-stage lung cancers or benign diseases, and multimodality treatment for locally advanced thoracic malignancies.

(6) Publications

[Original Articles]


[Others]
1. Chylothorax post thoracoscopic surgery for an anterior mediastinal tumor, 2017.11
General Thoracic and Cardiovascular Surgery, 2017.Nov.16.[Epub ahead of print]
Hironori Ishibashi, Yuya Ishikawa, Ayaka Asakawa, Sachiko Imai, Masashi,Kobayashi, Kenichi Okubo
Igakuken Disease-oriented Molecular Biology

Visiting Professor  Takahiko Hara
Visiting Professor  Makoto Arai
Visiting Professor  Masato Hasegawa
Visiting Professor  Haruo Okado
Graduate Student  Narumi Ikeda, Risa Kanda, Kasumi Kori, Riichi Okuda, Yuna Takahashi (April~), Maki Nakasone (April~), Takahiro Mitsui (April~), Harumi Tabata (April~)

(1) Research

[Takahiko Hara] We attempt to elucidate how tissue stem cells (hematopoietic stem cells, skeletal muscle stem cells, etc.) are developed in embryos and maintained in adults by utilizing in vitro differentiation systems of ES/iPS cells and conditional KO mouse strains. In addition, we advance the molecular biology of CXCL14, which is involved in obesity-induced diabetes, carcinogenesis, feeding behavior, etc.

[Makoto Arai] Our research focuses on unraveling the pathophysiology of mental illnesses using molecular biology tools. Our ultimate goal is to identify new disease mechanisms, leading to the development of novel and more efficacious therapies. We perform genetic association studies, as well as metabolomics studies using samples from patients with mental disorders. Any abnormalities identified from patient samples are investigated further, using in vitro and in vivo systems, such as, cell culture assays to highlight functional alterations and behavioral studies in gene knockout mouse models.

[Masato Hasegawa] We investigate the molecular pathogenesis and progression of neurodegenerative diseases including Alzheimer’s disease, Parkinson’s disease and amyotrophic lateral sclerosis. We use biochemistry, immunohistochemistry and molecular biology in all our work of in vitro, cellular and animal models to find effective ways for clinical therapy.

[Haruo Okado] To discover the fundamental cause of various nervous diseases, e.g., brain tumors, brain malformations, and neurodevelopmental disorders, we will study the molecular mechanisms for the regulation of neural development in the cerebral cortex using gene-targeted mice, primary cultures, viral vectors, in-utero
electroporation, real-time imaging of slice culture, immunohistochemistry, and transcription analysis.

(2) Education

We will educate students for the purpose that they could investigate molecular mechanisms of life-threatening diseases such as cancer, diabetes, schizophrenia, amyotrophic lateral sclerosis, and brain malformations. Trained students will eventually help us to develop novel therapeutic strategies against them. In addition, they must learn the importance of good animal models (including genetically engineered mice), which faithfully reproduce symptom and progression of the diseases.

(3) Publications

[Original Articles]


[Review Articles]


[Books]

[Conference Activities & Talks]
1. Y Horiouchi, M Miyashita, K Toriumi, M Itokawa, and M Arai. Influence of carbonyl stress on neural cells derived from induced pluripotent cell. 5th Congress of Asian College of Neuropsychopharmacology (AsCNP), 2017.4.27, Nusa Dua Bali, Indonesia.


Clinical Anatomy

Professor Keiichi AKITA
Associate Professor Akimoto NIMURA (Department of Functional Joint Anatomy)
Junior Associate Professor Kumiko YAMAGUCHI
(Department of Professional Development in Health Science)
Assistant Professor Masayo HARADA, Hisayo NASU
Takashi MIYAMOTO (Department of Functional Joint Anatomy)
Parttime lecturer Kenji IBUKURO, Itsuko OKUDA, Sachiyuki TSUKADA, Masataka NAKAZAWA
Graduate Student Kazuhito SEKIZAWA, Keiko OKUMURA, Ryuhei OKADA, Eichiro KAGAWA,
Motoki TANAKA, Kotaro EGUCHI, Saya HORIUCHI, Pawaroe NONTHASAEN, Natnicha KAMPAN,
Kentaro AMAHA, Yusuke UEDA,Yasunori TATARA, Shota HOSHIKA, Phichaya BARMEE,
Atsuiko OCHI, Souichi HATTORI, Kou MIWA, Satoru MURO, Suriyut JANARUK,
Syusaku HOSONO (April ~), Haruka EISHI (April ~), Masahiro TSUTSUMI (April ~),
Wachirawit SIRIRAT (April ~)
Research Student Hirokazu SAKAMOTO, Mamiko SUZUKI,

(1) Outline

Department of Clinical Anatomy supports clinical medicine through formulation of human anatomical and
developmental biological bases of diagnoses and surgical procedures. We handle the whole body in human
anatomical researches. We think it is classic but important to represent human morphology for exactly what
they are based on meticulous observations of human body structures regardless of diagnostic technics and
surgical procedures. Our researches are aimed to share languages among all clinicians based on clinical anatomy
by describing the results of observations in an accessible way for clinicians. In addition, we perform analyses
using experimental embryological approaches and developmental biological approaches, because we think it is
important to consider how human structures are constructed.

(2) Research

1) Clinical anatomic study of the shoulder joint and rotator cuff.
2) Clinical anatomic study of the anal region for the rectoanal surgery.
3) Cadaveric study of the female pelvis for the gynecologic oncology and colposcopy.
4) Analyses of the lamination in the masticatory muscles with special reference of nerve supply.
5) Embryological study of the differentiation of cloaca and surrounding muscles.

(3) Education

Clinical anatomy is generally considered as the practical application of anatomical knowledge to diagnosis and
treatment, however we think that this course is a part of pure anatomical science based on the findings of the
morphological observations of the human bodies. Main objective of Clinical anatomy in the graduate course is to
make detailed anatomical data to answer the questions developed from clinical fields especially by surgeons and
radiologists. We collaborate with many clinicians: ENT, orthopedics, gynecology, thoracic surgery, radiology
and so on, and our projects have been broad areas. Students are expected to get fine dissection techniques of
human bodies and also learn techniques of histology and embryological experiments. By using these techniques, we study the spatial relationships of organs, vessels nerves, and also try to examine their developmental processes in various projects.

(4) Lectures & Courses

Theories and hypotheses of morphogenesis derived from descriptive anatomy and descriptive biology have been confirmed and modified by experimental biology. Furthermore, progresses of developmental biology identified molecules and signaling pathways involved in the morphogenesis. Progresses in the developmental biology also verified morphological hypotheses, and added revisions to the morphological models. The postulates of the morphological models which are currently investigated were built and completed by Anatomy. However, we find Anatomy is still not completed and has many obscure issues through careful dissection of human body. It might be thought that everything was done and there could be no new finding in the human anatomical field anymore because the anatomy employs the classic procedures such as the gross anatomy. However, there are still a lot of unclear anatomical topics, because they had not been focused and not investigated with their clinical significances.

(5) Publications

[Original Articles]


2. Keiko Okumura, Kumiko Yamaguchi, Tatsuya Tamaki, Kazuhiro Oinuma, Hikaru Tomoe, Keiichi Akita. Prospective analyses of female urinary incontinence symptoms following total hip arthroplasty. Int Urogynecol J. 2017.04; 28(4); 561-568


7. Satoshi Usami, Mutsumi Okazaki, Tomohisa Nitta, Noriko Uemura, Tsutomu Homma, Keiichi Akita. Histological investigation of common insensate flaps obtained from the hand and forearm regions for use in fingertip reconstruction. J Plast Surg Hand Surg. 2017.06; 51(3); 182-186


11. Minobu Kamo, Taiki Nozaki, Jay Starkey, Saya Horiuchi, Natsuka Muraishi, Kazunori Hattori, Keiichi Akita. The peak site of stone distribution in the upper ureter is unlikely the ureteropelvic junction: Computed Tomography Analysis of Stone Lodging Site With Respect to a Newly Identified Area of Constriction. Urology. 2017.09; 107; 31-36


13. Takamitsu Arakawa, Takahiro Kondo, Masahiro Tsutsumi, Yuko Watanabe, Toshio Terashima, Akinori Miki. Multiple muscular variations including teniusimus and tensor fasciae suralis muscles in the posterior thigh of a human case. Anat Sci Int. 2017.09; 92(4); 581-584


[Misc]


[Conference Activities & Talks]


2. Saya Horiuchi, Taiki Nozaki, Atsushi Tasaki, Sachiko Ohde, Jay Starkey, Deshpande Gautam, Yasuyo Teramura, Yasuyuki Kurihara, Hiroshihe Yoshioka. Comparison of 3D isotropic fast spin-echo and conventional 2D shoulder MRI for the evaluation of rotator cuff. Annual Congress of the European Congress of Radiology 2017.03.01 Vienna, Austria


9. Kentaro Amaha, Akimoto Nimura, Soichi Hattori, Reiko Yamaguchi, Keiichi Akita. Anatomic study regarding the medial side of the ankle based on the joint capsule. 14th Association France Japon d’Orthopedie 2017.05.12 Nikko, Tochigi

10. Yusuke Ueda, John G Costouros, Emilie Cheung. Deep shoulder infection: Prosthetic reimplantation or cement spacer retention?. The 62nd Annual LeRoy C. Abbott Society Scientific Program 2017.05.12 San Francisco, USA


17. Keiichi Akita. Surgical Anatomy of the pancreas with special reference to the nerves to the pancreas and the ligament of Treitz. Post graduate Seminar in Siriraj Hospital, Mahidol University 2017.08.28 Bangkok, Thailand

18. Yusuke Ueda, John G Costouros, Emilie Cheung. Low body mass index and young age are associated with inferior outcomes after reverse total shoulder arthroplasty. 1st AP Shoulder and Elbow Symposium 2017.10.07 Tokyo, Japan


20. Ryuhei Okada, Masaru Yokomura, Keiji Oi, Yusuke Arizumi, Yusuke Kiyokawa, Fuminori Nomura, Akihisa Tasaki, Yumiko Tateishi, Susumu Kirimura, Takahiro Asakage. Medullary thyroid carcinoma detected based on elevated serum procalcitonin levels: A case report. 2nd Congress of Asia-Pacific Society of Thyroid Surgery 2017.11.02
Systems BioMedicine

Professor Hiroshi ASAHARA
Junior Associate Professor Masahiro SHINOHARA
Assistant Professor Tomoki CHIBA
Project Assistant Professor Takahide MATSUSHIMA, Ryouta KURIMOTO
Project Researcher Yoko TANAKA
Graduate Students
Kensuke KATAOKA, Yuki YANO, Hirotu YAMAMOTO,
Takahiro MITSUMURA, Takayuki MIYAZAKI, Kihou TAKADA
Yusuke MOCHIZUKI

(1) Research

We revealed that A-to-I RNA editing altered target genes of microRNAs using a reporter library.
The function and regulatory mechanisms of eIF2 gamma will be examined.
Search for novel regulator of microRNA by high throughput screening.
Established novel strategies for the osteoporosis by targeting molecules critical for the bone homeostasis.
Revealed the molecular mechanism by which osteocytes regulate bone homeostasis.
Analyzed the bone phenotype of spaceflight mice.
Analyzed molecular mechanisms by which the bone tissue regulates the energy metabolism.
The Screening of novel Damage-associated molecular patterns proteins
Protein localization analysis by High-throughput microscope system
MiRNA which regulates cartilage homeostasis was identified.
We developed screening system for miRNA target genes using reporter vector library.
MicroRNA KO mice were generated using CRISPR/Cas9 system, and its function in skeletal pattern formation
was analyzed.
Molecular mechanisms and in vivo roles of RNA-binding proteins and long non-coding RNAs in the context of
inflammatory response

(2) Education

Under Graduate:
Conducting “Molecular Genetics”, which is a series of lectures to understand the gene expression machinery
and human genetics and their application to current medicine and biology. Under graduate students can join
the lab works to learn the skills for molecular biology and pathology.
Graduate School:
Organizing “Development and Regeneration” lecture series to understand the basis for regenerative medicine
and reproduction at the level of molecular genetics.
Students can join the Lab to perform researches using various experimental techniques, such as microarray, cell-
based high throughput screening etc. Using these techniques, core molecular network for tissue development
and inflammatory diseases will be examined, which forms the basis of systems biomedicine.
(3) Publications

[Original Articles]


8. Emiko Sakaida, Takahiro Ebata, Shunichiro Iwasawa, Ryota Kurimoto, Sachiko Yonemori, Satoshi Ota, Yukio Nakatani, Ikuko Sekine, Yuichi Takiguchi. Potential Activity of Amrubicin as a Salvage Therapy for Merkel Cell Carcinoma. Oncology Letters. 2017.05; 14(1); 944-950


17. Asahara H*, Imui M*, Lotz M. Tendons and Ligaments: Connecting Developmental Biology to Musculoskeletal Disease Pathogenesis. 2017.09; 32(9); 1773-1782


[Books etc]
1. Ryota Kurimoto, Yuichi Takiguchi. Targeting Epithelial-Mesenchymal Transition and Cancer Stem Cell. 2017.01

[Misc]
1. Masahiro Shinohara. Osteoporosis in spaceflight and osteoclasts Kidney and Metabolic Bone Diseases. 2017.07; 30(3); 195-202

2. Okamoto K, Nakashima T, Shinohara M, Negishi-Koga T, Komatsu N, Terashima A, Sawa S, Nitta T, Takayanagi H. Osteoimmunology: the conceptual framework unifying the immune and skeletal systems Physiol Rev. 2017.10; 97(4); 1295-1349

[Conference Activities & Talks]
1. Hiroshi Asahara. Tendon development and regeneration analyzed by Mkx KO Rat. The 291st IMEG Seminar 2017.02.24

2. Hiroshi Asahara. Identification of targets of tumor suppressor microRNA-34a using a reporter library system . RNA 2017—Prague 2017.05.25 Prague

3. Tomoki Chiba, Hiroshi Asahara. Regulation of inflammatory cytokine expression by long non-coding RNA LASC. The 43rd Naito Conference 2017.06.27

4. Hiroshi Asahara. miRNA in Cancer, Arthritis and Homeostasis. The 43rd Naito Conference 2017.06.29


8. The Future of HiBiT Technology for Molecular Biological Analysis. 2017.12.07

Comprehensive Pathology

Professor
Masanobu KITAGAWA
Senior associate Professor
Morito KURATA
Assistant Professor
Kouhei YAMAMOTO, Iichiro ONISHI
Laboratory Technician
Miori INOUE
Technical Assistant
Sachiko ISHIBASHI, Masumi IKEDA,
Graduate Students
Yuko KINOWAKI, GULINISHA Aihemaiti, Masae Yanai,
Mariko Muto, Ryoko KATO, Naoko OZAWA, Norikazu MIYAMOTO, Risa Fusa,
Sumito Shingaki, Masanori Matsuda, Tan Wang, Akiko YAMAMOTO,
Miyaka Umemori, Jyunichiro SATO, Masahiro KATO, Msahiro KATO,
Noriaki FUKUHARA, Tomohiro YOKOUCHI, Shigeo TODA,
Jyunnosuke HAYASAKA, Tatsunori Mineo, Vilayvong Sulideyh,
Luangxay Thitsamay, Abudushalamu Muyashaer,

(1) Outline

Main objective of comprehensive pathology in the graduate course is to acquire the technique of clinical and basic pathology. This course provides students opportunity to study clinical pathology (for example, histological and cytological diagnosis, autopsy, clinico-pathologic conference) and also basic pathology (molecular pathology and molecular biology).

(2) Research

1) Clinico-pathological study by morphological findings, immunohistochemistry, and electron microscope, etc.
2) Molecular analysis of leukomogenesis induced by Friend leukemia virus (FLV)
3) Enhancement of apoptosis by virus-derived protein and development of apoptosis-induction cancer therapy
4) Molecular pathology of the myelodysplastic syndromes (MDS)
5) Clarification of drug resistance mechanism for hematopoietic malignancies
6) Comprehensive research for aging focus on the decreased immune competence
7) Molecular biology of the cancer progression and metastasis

(3) Education

Main objective of comprehensive pathology in the graduate course is to acquire the techniques of clinical and basic pathology. This course provides students opportunities to study clinical pathology (for example, histological and cytological diagnosis, autopsy, clinico-pathologic conference) and also basic pathology (molecular pathology and molecular biology).
(4) Publications

[Original Articles]


8. Akira Torihara, Ayako Arai, Masashi Nakadate, Kouhei Yamamoto, Ken-Ichi Imadome, Osamu Miura, Ukihide Tateishi. FDG-PET/CT findings of chronic active Epstein-Barr virus infection. Leuk. Lymphoma. 2017.10; 1-4


10. Yae Ohata, Anna Tatsuzawa, Yoshio Ohyama, Ayako Ichikawa, Yumi Mochizuki, Sachiko Ishibashi, Yuri Itakura, Urara Sakurai, Kei Sakamoto, Tohru Ikeda, Masanobu Kitagawa, Kouhei Yamamoto. A distinctive subgroup of oral EBV+ B-cell neoplasm with polymorphous features is potentially identical to EBV+ mucocutaneous ulcer. Hum. Pathol.. 2017.11; 69; 129-139
Molecular Oncology

Professor: Shinji TANAKA
Associate Professor: Yoshimitsu AKIYAMA
Associate Professor: Hiroshi FUKAMACHI
Assistant Professor: Shu SHIMADA
Laboratory Technician: Hiromi NAGASAKI
Graduate Student: Taketo NISHIKAWAJI
Graduate Student: Misaki SERIZAWA

(1) Outline
To understand the molecular mechanisms underlying carcinogenesis and malignant progression for clinical application of cancer prevention, diagnosis and treatment.

(2) Research
1. Molecular analysis of refractory malignancies including liver, pancreatic and scirrhous gastric cancers
2. Development of molecularly targeted therapy for refractory malignancies
3. Cancer epigenetics/epigenomics and clinical application in refractory malignancies
4. Research of cancer stem cells and targeted therapy
5. Development of regenerative medicine using stem cell research

(3) Education
Hygiene is our charge. The undergraduate curriculum of hygiene includes lectures, and laboratory studies. Topics of lectures consist of environmental pollution and human health, world-wide environmental problems, carcinogen and occupational cancer, smoking-related diseases, infectious diseases including AIDS and hepatitis, food poisoning, anoxia and heat-related diseases.

(4) Lectures & Courses
The graduate students pursue their own projects associated with one of researches being in progress in the division. Every student can learn the basic scientific techniques, such as genetic engineering, cell culture and biochemical procedures. There are also many special lectures on cancer, gene, cell biology and biochemistry for the graduate students. On weekly seminars, the students present their own research data and introduce important papers from newly-arrived journals. Once the students get new findings, they are encouraged to present them at the domestic or international meeting and write manuscripts.

(5) Publications
[Original Articles]


4. Atsushi Oba, Atsushi Kudo, Keiichi Akahoshi, Mitsuhiro Kishino, Takumi Akashi, Eriko Katsuta, Yasuhito Iwao, Hiroaki Ono, Yusuke Mitsunori, Daisuke Ban, Shinji Tanaka, Yoshinobu Eishi, Ukihide Tateishi, Minoru Tanabe. A simple morphological classification to estimate the malignant potential of pancreatic neuroendocrine tumors. J. Gastroenterol.. 2017.05; 52(10); 1140-1146


[Books etc]

[Misc]

[Conference Activities & Talks]


3. Hiroaki Ono, Keiichi Akahoshi, Yasuhito Iwao, Satoshi Matsumura, Yusuke Mitsunori, Daisuke Ban, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Clinical evaluation of lymph node metastasis after surgery of IPMN. 6th A-PHPBA 29th JSHBPS 2017.06.08 yokohama


5. Atsushi Kudo, Daisuke Ban, Keiichi Akahoshi, Satoshi Matsumura, Yusuke Mitsunori, Yasuhito Iwao, Shinji Tanaka, Minoru Tanabe. How to manage liver metastases of pancreatic NET?. 6th A-PHPBA & 29th JSHBPS 2017.06.08 yokohama
6. Atsushi Kudo, Daisuke Ban, Keiichi Akahoshi, Yusuke Mitsunori, Shinji Tanaka, Minoru Tanabe. Systemic therapy may decide surgical indication for patients with Unresectable of Metastatic Pancreatic Neuroendocrine Tumor. 6th A-PHPBA & 29th JSHBPS 2017.06.08 yokohama

7. Shuichi Watanabe, Daisuke Ban, Yasuhiro Iwao, Keiichi Akahoshi, Akihiro Ono, Yusuke Mitsunori, Satoshi Matsumura, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Study of the prognosis of recurrent pancreatic cancer: The significance of the solitary recurrence. 2017.06.08

8. Hiroki Ueda, Daisuke Ban, Atsushi Kudo, Takanori Ochiai, Shinji Tanaka, Minoru Tanabe. Refractory long-term cholangitis after pancreaticoduodenectomy: a retrospective study. 6th A-PHPBA & 29th JSHBPS 2017.06.09 yokohama


10. Takehiro Okabayashi, Daisuke Asano, Keiichi Akahoshi, Hiroaki Ono, Yusuke Mitsunori, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. The optimal management depending on the features of CT imaging of borderline resectable pancreatic cancer. 6th A-PHPBA & 29th JSHBPS 2017.06.09 yokohama

11. Takehisa Yazawa, Hiroki Ono, Yasuhiro Iwao, Satoshi Matsumura, Yusuke Mitsunori, Daisuke Ban, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Clinical significance of enhancing nodules in preoperative imaging studies of IPMN. 6th A-PHPBA & 29th JSHBPS 2017.06.10 yokohama


[Patents]

1. Dominant negative mutants of IRS-1 and uses there of (Tanaka S, Wands JR), Patent Number: United States Patent 6,528,479

Surgical Pathology

Professor：Masanobu KITAGAWA
Associate Professor：Takumi AKASHI
Assistant Professor：Emiko SUGAWARA,Susumu KIRIMURA, Shohei TOMII,Atsuko KONTA
Hospital Staff Doctor：Keiko MIURA
Secretary：Ayako UENO

(1) Outline

Missions of diagnostic pathology are summarized to following 4 items. 1) participation to the medical treatment of the patients through anatomical diagnosis 2) assessment of medical treatment through autopsy examination 3) training of diagnostic pathologists 4) development of diagnostic methods by anatomical, immunohistochemical, microbiological and molecular technologies.

In cooperation with departments of human pathology and comprehensive pathology, department of surgical pathology provides 1. diagnostic pathology services for the clinicians of the affiliated hospital 2. education of medical students and post-graduate students through both lectures and medical practice 3. development of new methods in diagnostic pathology.

(2) Research

1) Analysis of the pathophysiology of the disease, especially invasion mechanism of lung and gastrointestinal cancers by molecular biological technology.
2) Identification of epithelial neoplasms with chromosome translocation
3) Carcinogenesis of prostatic cancer in view of microbiology

(3) Education

Main object of surgical pathology in the course of graduate school is to provide medical students opportunity to study pathophysiology and diagnosis of core diseases, both neoplastic and non-neoplastic, through biopsy, surgical and autopsy cases. Another important mission is a training of pathology specialist in the post-graduate school through diagnostic services of surgical pathology, cytopathology and autopsy.

(4) Lectures & Courses

The initial purpose of this program is to acquire how to morphologically diagnose both neoplastic and non-neoplastic diseases. In addition, it is also very important to recognize the limitations and problems of morphological diagnosis and to learn the morphological and molecular methods which are necessary for the resolution of the problems. The ultimate purpose is to develop a new diagnostic method which can resolve the problems of morphological diagnosis.
Clinical Services & Other Works

In cooperation with departments of human pathology and comprehensive pathology, department of surgical pathology provides autopsy services (38 case in a year), cytopathology services (9,957 cases in a year) and surgical pathology (11,574 cases in a year) for the clinicians of the affiliated hospital. Diagnosis is mostly done by the organ-subspecilized staffs. Clinico-pathological conferences have been held about two hundred times in 2014.

Clinical Performances

Department of diagnostic pathology participates in the medical treatment of the patients through anatomical diagnosis. In the era of molecule-targeted therapy, specialized information has been requested in the field of pathological diagnosis. In order to appropriately respond to a latest request of clinicians, we practice pathological diagnosis in cooperation with departments of human pathology and comprehensive pathology with latest techniques, such as immunohistochemistry, electron microscopy, and FISH.

Publications

[Original Articles]


2. Yumi Sakakibara, Yoshimi Suzuki, Toshihide Fujie, Takumi Akashi, Tadatsune Iida, Yasunari Miyazaki, Yoshinobu Eishi, Naohiko Inase. Radiopathological Features and Identification of Mycobacterial Infections in Granulomatous Nodules Resected from the Lung. Respiration. 2017.03; 93(4); 264-270


Experimental Animal Model for Human Disease

Professor
Masami Kanai-Azuma
Junior Associate Professor
Yoshikazu Hirate
Assistant Professor
Shu Endo
Assistant Professor
Hitomi Suzuki
Assistant Professor
Hinako M Takase

(1) Research

1) Molecular biological analysis of organ formation using knockout mice and knockout ES cells.
2) Application of Sox17 mutant mice as the animal model for human disease.
3) Analysis of molecular mechanisms using mice with implantation defects.
4) Analysis of folliculogenesis using disease-model mouse for premature ovarian insufficiency.
5) Study of the molecular events involved in the regulation of spermatogonial stem cells.

(2) Publications

[Original Articles]
1. Hiroki Higashiyama, Aisa Ozawa, Hiroyuki Sumitomo, Mami Uemura, Ko Fujino, Hitomi Igarashi, Kenya Imaimatsu, Naoki Tsunekawa, Yoshikazu Hirate, Masamichi Kurohmaru, Yukio Saijoh, Masami Kanai-Azuma, Yoshiakira Kanai. Embryonic cholecystitis and defective gallbladder contraction in the Sox17-haploinsufficient mouse model of biliary atresia. Development. 2017.05; 144(10); 1906-1917


[Conference Activities & Talks]
1. Hirate Yoshikazu, Hayakawa Kana, Toyomura Yuga, Igarashi Hitomi, Miura Kento, Kanai Yoshiakira, Kanai-Azuma Masami. Sox17heterozygous mutant females are defective in implantation. Annual Meeting of the Japanese Society of Developmental Biologists 50th 2017.05.10 Tower Hall Funabori
Signal Gene Regulation

Professor NAKAMURA Masataka
Associate Professor FUNATO Noriko
Assistant Professor MIZUGUCHI Mariko

(1) Research

1) Molecular mechanism of tumorigenesis by human T-cell leukemia virus type I (HTLV-I).
2) Roles of transcription factors in cell differentiation.
3) Implication of prostaglandin D2 receptor (CRTH2) in allergy reactions.

(2) Lectures & Courses

The aim of Human Gene Sciences Center is to provide laboratory equipment, room and information for researches in advanced molecular and cellular biology. In educational objectives in the graduate school, our Center gives lecture, seminar, training course and individual assistance in research fields of molecular genetics, immunology and virology.

(3) Publications

[Original Articles]


[Conference Activities & Talks]

1. Mariko Mizuguchi, Toshifumi Hara, Manami Yoshita-Takahashi, Yuetsu Tanaka, Takuya Fukushima, Masataka Nakamura. Expression of the Human Telomerase Reverse Transcriptase (hTERT) in Human T-cell Leukemia Virus Type 1 (HTLV-1)-Infected T-cells.. The 18th International Conference on Human Retrovirology: HTLV and Related Viruses 2017.03.08 Tokyo


— 392 —
Material Biofunctions

Keiji Itaka (Professor)
Akiko Nagai (Associate Professor)
Kosuke Nozaki (Assistant Professor)

(1) Outline

The mission of this lab is to develop innovative medical technologies based on the science of biomaterials, DDS, and molecular biology. We aim at regulating biofunctions of host cells and the biomaterials, obtaining proof-of-concept of the therapeutic strategies by animal studies, and pursuing their clinical applications in collaboration with hospitals and companies.

1. mRNA-based therapeutics: a new paradigm of gene therapy

Gene therapy is defined as introducing genetic information for therapeutic purposes. Besides the conventional strategy of protein replacement for congenital gene defects, gene therapy may have wide application, including vaccination against cancer and infectious diseases, regenerative medicine by in situ cell regulation by introducing “therapeutic” gene(s), and the ultimate goal of “gene” therapy by the technology of gene editing. In addition, cell therapy combined with ex vivo gene introduction is also a promising field. Messenger RNA (mRNA) is a new tool for introducing the genetic information. Direct delivery of mRNA into cells is highlighted as a safe and effective method without concerning the risk of random integration into the genome. Despite the fact that mRNA delivered in the body would be susceptible to highly active RNases that are ubiquitous in the extracellular space, we have established a drug delivery system (DDS) based on synthesized polymers, polyplex nanomicelle, to transport mRNA into target cells by preventing its degradation. We have already achieved in vivo mRNA administration for therapeutic purposes of various organs and tissues including brain, spinal cord, bone, articular cartilage, skeletal muscle, and liver. The mRNA-based therapy is indicated for treatment of various diseases including the fields of gene therapy, cell therapy, and regenerative medicine.

2. Generally-modified spheroid cell culture system for cell transplantation

Cell transplantation therapy is an attractive strategy for various medical fields. One serious problem is that the therapeutic effects may be limited by the death of transplanted cells or the decrease in cell activity due to unfavorable microenvironments such as ischemia, hypoxia, or inflammation. We established an injectable spheroid system for cell transplantation therapy, based on three-dimensional (3D) spheroid cell culture system for preserving cell-to-cell interaction using micropatterned plates coated with a thermosensitive polymer. In addition, the genetic modification of the cells using a biocompatible non-viral gene carrier, polyplex nanomicelle, was integrated for augmenting the therapeutic effects of cell transplantation. This system can be used for many applications of cell transplantation therapy.

3. Development of functional dental implants

Although dental implant treatment has already been clinically applied and excellent clinical progress has been reported, some cases demonstrate the unexpected disorder. Because natural teeth integrate the bone via periodontal ligament to exert their functions, the osseointegration, which is a healing form of current dental implant, is thought to be one of the causes. In this department, we are working on the development of periodontal ligament-bonded dental implant material, and we are trying to elucidate the mechanism of periodontal tissue homeostasis.
4. Interaction between biomaterials and the host tissues
To develop a new biomaterial for clinical applications, the material is requested to enhance biocompatibility and to decrease possible side effects in addition to its functionality. Biomaterials meet and interact with the living tissues at their interfaces. We evaluate phenomena of material-tissue interfaces and try to clarify the mechanism through material science and biological methods. These findings based on surface science contribute to develop new biomaterial designs.

(2) Education

The objective and principle of this graduate course is to educate students with materials knowledge demanded to medical and dental doctors who are leading medical professionals and bioscientists who are capable of carrying out their own research at an international level in the area of their special fields of science, respectively.

(3) Publications

[Original Articles]


13. test. test test. 2017.11; 1(1); 1-3

[Books etc]


[Conference Activities & Talks]

1. Inokoshi M, Shimizu H, Nozaki K, Takagaki T, Zhang, F, Vleugels J, Van Meerbeek B, Uo M, Minakuchi S. Crystallographic analysis of alumina sandblasted highly translucent dental zirconia. 95th General Session and Exhibition of the IADR 2017.03 San Francisco


Genetic Regulation

Professor Akinori KIMURA
Associate Professor Takeharu HAYASHI
Assistant Professor Jianbo AN
Research Associate Taeko K. NARUSE

(1) Outline
Research and Education in the Department of Genetic Regulation are carried out by staff members of the Department of Molecular Pathogenesis, Medical Research institute. The main purpose of this Department is to decipher the genetic regulation involved in the pathogenesis of intractable diseases, including hereditary cardiovascular diseases such as hypertrophic cardiomyopathy, dilated cardiomyopathy and hereditary arrhythmia, autoimmune diseases such as rheumatoid arthritis, type I diabetes mellitus, autoimmune thyroid diseases (Graves disease and Hashimoto thyroiditis), inflammatory bowel diseases (Crohn disease and ulcerative colitis) and SLE, as well as infectious diseases including HIV/AIDS. We also investigate molecular pathogenesis of coronary heart disease (atherosclerosis) and intractable vascular diseases (Takayasu arteritis and Buerger disease).

(2) Research
1) Identification and functional analysis of disease-related genes for cardiovascular diseases including hereditary cardiomyopathy and arrhythmia
2) Identification and functional analysis of disease-related genes for autoimmune diseases including autoimmune thyroiditis and inflammatory bowel disease
3) Identification and functional analysis of disease-related genes for infectious diseases including HIV-1 infection
4) Structural, functional and evolutionary analyses of MHC and immune-related genes
5) Evolutionary medicine for human diseases

(3) Education
Structural and functional diversity of human genome, are involved in the etiology and pathogenesis of human diseases. Main objective of Genetic Regulation is to identify the gene mutations or polymorphisms and to decipher the molecular mechanisms involved in the etiology and pathogenesis of intractable diseases, in order to develop new strategies for diagnosis, treatment and/or prevention of the diseases. Current research is focused on the intractable cardiovascular diseases (e.g. idiopathic cardiomyopathy, idiopathic arrhythmia, and coronary heart disease), autoimmune diseases (e.g. Burger disease, Graves disease, and rheumatoid arthritis) and infectious diseases (e.g. HIV/AIDS). In addition, genome diversity in immune-related genes is investigated from the view-point of primate evolution.

(4) Lectures & Courses
Main purpose is to understand the molecular pathogenesis of various intractable diseases by methodologies in the fields of Human Genetics, Genome Medicine, Biochemistry and Cell Biology.
(5) Publications

[Original Articles]

1. Eri Kikkawa, Masafumi Tanaka, Taeko K Naruse, Tomi T Tsuda, Michio Tsuda, Koichi Murata, Akinori Kimura. Diversity of MHC class I alleles in Spheniscus humboldti. Immunogenetics. 2017.02; 69(2); 113-124


3. Teruki Sato, Chitose Sato, Ayumi Kadowaki, Hiroyuki Watanabe, Lena Ho, Junji Ishida, Tomokazu Yamaguchi, Akinori Kimura, Akiyoshi Fukamizu, Josef M Penninger, Bruno Reversade, Hiroshi Ito, Yumiko Imai, Keiji Kuba. ELABELA-APJ axis protects from pressure overload heart failure and angiotensin II-induced cardiac damage. Cardiovasc. Res.. 2017.06; 113(7); 760-769

4. Zhiyong Chen, Yan Wang, Masataka Kuwana, Xue Xu, Wei Hu, Xuebing Feng, Hong Wang, Akinori Kimura, Lingyun Sun. HLA-DRB1 Alleles as Genetic Risk Factors for the Development of Anti-MDA5 Antibodies in Patients with Dermatomyositis. J. Rheumatol.. 2017.09; 44(9); 1389-1393


Applied Gene Medicine

Professor Yoshio MIKI
Assistant Professor Akira NAKANISHI
Assistant professor Miho TAKAOKA
Project Assistant Professor Ken MIYAGUCHI
Graduate Student Konuskan Ucar AYSE,
Shun ITO,
Maiko UMEGAKI,
Gen SATO
Naoko Otsuka

(1) Outline

Since 1981, cancer has been a top leading cause of death in our country and a novel action is an urgent social challenge. In Department of Molecular Genetics, we aim to study a basic biology underlying cancer and establish novel diagnostic and therapeutic modalities based on findings from the fundamental researches. We have largely focused on three major research directions to understand the molecular mechanisms of breast cancer development: 1) Uncovering DNA damage repair function and genome stabilization mechanism, 2) Uncovering hormone-dependent cellular proliferation, and 3) Determining how the tumor microenvironment contributes to cancer development and progression. Utilizing a wide variety of approaches in genomics, molecular biology, biochemistry and informatics, we are addressing an integrative understanding of multidisciplinary analyses.

(2) Research

1. Molecular Mechanisms of Breast Cancer Progression
   ◆ Understanding Molecular Mechanisms of Metastasis, Invasion, Recurrence in Cancer
   ◆ Uncovering Molecular functions of hereditary breast cancer genes, BRCA1 and BRCA2

2. Cancer Genomics Research
   ◆ Cancer Genomics Research with Next-Generation Sequencing
     ◆ Identification of Genes Involved in Human Cancer Using Genome-Wide Association Studies

3. Cell Death Signaling in Cancer

4. DNA Damage Repair and Genome Instability in Cancer

5. Hormone-Dependent Breast Cancer Cell Growth

6. Cancer Microenvironment

(3) Education

Our research is directed at understanding the molecular mechanism of carcinogenesis, based on basic molecular cell biology and molecular genetics. We have applied new findings and information obtained by basic research to develop the new diagnosis, treatment, and prevention of cancer. Our objective in the graduate course is to provide students opportunity to study basic science and applied genome science for cancer research.
1. Nguyen CT, Okamura T, Morita K, Yamaguchi S, Harada H, Miki Y, Izumoto T, Kayamori K, Yamaguchi A, Sakamoto K. LAMC2 is a predictive marker for the malignant progression of leukoplakia Journal of Oral Pathology and Medicine. 2017.03; 46(3); 223-231


15. Hiroshi Yokomichi, Akiko Nagai, Makoto Hirata, Yutaka Kiyohara, Kaori Muto, Toshiharu Ninomiya, Koichi Matsuda, Yoichiro Kamatani, Akiko Tamakoshi, Michiaki Kubo, Yusuke Nakamura, BioBank
Advanced Therapeutic Sciences


17. Miho Takaoka, Shun Ito, Yoshi Miki, Akira Nakanishi. FKBP51 regulates cell motility and invasion via RhoA signaling. Cancer Sci.. 2017.03; 108(3); 380-389


[Conference Activities & Talks]

1. Takaoka Miho, Ito Shun, Miki Yoshi, Nakanishi Akira. FKBP51 regulates cell motility and invasion via RhoA signaling. Cancer Science 2017.03.01
2. Ami Sato. BRCA2 and estrogen receptor are translocated to nucleus via KPNA7. 2017.12.06
Molecular Cytogenetics

Professor Johji Inazawa M.D., Ph.D.
Lecturer Jun Inoue Ph.D.
Assistant Professor Tomoki Muramatsu Ph.D.
Assistant Professor Yasuyuki Gen M.D., Ph.D.

(1) Research

1. Identification of genes responsible for intractable diseases including cancer and genomic disorders through integrative genomics and epigenomics.
2. Discovery of molecular mechanisms of cancer-related genes, including microRNAs, in the multistep processes of carcinogenesis and cancer progression, such as cancer stem cell, epithelial-mesenchymal transition (EMT), invasion and metastasis using systems biology.
3. Establishment of autophagy-based diagnosis and therapy in human cancers by understanding cellular context-dependent role of autophagy.
4. Multiple genomic analyses of genetic disorders of unknown etiology, e.g. mental retardation or epilepsy, to detect causative genes and clarify the etiology. Also, an array chip for diagnosis of known congenital disorders, ‘Genome Disorder Array’, was developed and released for a practical use at 2009.
5. Development of innovative techniques for genomics and epigenomics in medical science.

(2) Lectures & Courses

The principal aim of the Department of Molecular Cytogenetics (MCG) is to understand the molecular mechanism underlying intractable diseases, such as cancer and uncharacterized genetic diseases. Main objective of MCG in the graduate course is to provide students opportunity to study molecular cytogenetic approach for intractable diseases, identify genes responsible for those diseases, and develop innovative techniques/practically useful tools for detection of genomic and epigenomic aberrations in those diseases. It is our goal to bridge the gap between basic and clinical research for the benefit of each of the patients.

(3) Publications

[Original Articles]


Genome-wide screening of DNA methylation associated with lymph node metastasis in esophageal squamous cell carcinoma. Oncotarget. 2017.06; 8(23); 37740-37750

4. Hidekazu Hiramoto, Tomoki Muramatsu, Daisuke Ichikawa, Kousuke Tanimoto, Satoru Yasukawa, Eigo Otsuji, Johji Inazawa. miR-509-5p and miR-1243 increase the sensitivity to gemcitabine by inhibiting epithelial-mesenchymal transition in pancreatic cancer. Sci Rep. 2017.06; 7(1); 4002


[Conference Activities & Talks]

1. Akdemir B, Inoue J, Kawano T, Inazawa J. High expression of MiR-432-3p is associated with the chemoresistance by NRF2 stabilization via directly targeting KEAP1. 108th annual meeting of American Association for Cancer Research 2017 2017.04.03 Washington D.C., USA.


Hematology

Professor Osamu Miura

Professor (Immunotherapy for Hematopoietic Disorders) Norihiko Kawamata

Junior Associate Professor Tetsuya Fukuda

Assistant Professor Masahide Yamamoto, Toshikage Nagao, Ken Watanabe

Project Assistant Professor Chizuko Sakashita

Assistant Professor (Department of Clinical Laboratory) Ayako Nogami

Senior Resident Tatsuya Saito, Hiroki Tsutsumi, Satoru Aoyama, Yoshihiro Umezawa

Graduate Student Hiroki Akiyama, Shinya Ishida, Keigo Okada, Koji Sasaki, Shuhei Fujita
Emi Uchida, Daisuke Watanabe, Sunichiro Yasuda

(1) Outline

The Department of Hematology is responsible for clinical services at our University Hospital with treatment of patients with various hematological disorders including leukemias, lymphomas, anemia, and hemorrhagic diseases by chemotherapies, immunotherapies, molecularly-targeted therapies, and hematopoietic cell transplantation. Our department is also responsible for teaching undergraduate students with the lecture course in hematology as well as the clinical clerkship and for training junior and senior residents. Our department is also actively involved, with doctoral course students, in basic and clinical researches aiming to elucidate the molecular and cellular mechanisms involved in pathogenesis of hematological malignancies as well as in acquisition of therapy resistance to develop novel efficient therapies against these diseases.

(2) Research

The research interests and activities of the Department of Hematology are diverse, and the following projects among others are currently under way. 1. Elucidation of the molecular mechanisms involved in acquisition of resistance against chemotherapies and molecularly-targeted therapies by leukemic cells from chronic myeloid leukemia, acute myeloid leukemia, and various myeloproliferative neoplasms expressing aberrant tyrosine kinases, including BCR/ABL, FLT3-ITD, and Jak2-V617F, aiming to develop novel therapeutic strategies to overcome the resistance. 2. Elucidation of the regulation mechanisms for immune responses to indolent lymphoid neoplasms, including chronic lymphocytic leukemia, for developing novel immunotherapies. 3. Signal transduction mechanisms from cytokine/growth factor receptors regulating proliferation, survival, and adhesion of hematopoietic cells including leukemia and lymphoma cells. The Department is also actively involved in a variety of clinical studies for treatment of various leukemias, lymphomas, and multiple myeloma.
(3) Education

The Department of hematology is responsible for teaching basic and clinical hematology to the 3rd and 4th grade students in the integrated hematology course and the hematology and oncology united block course. The Department is also responsible for teaching the 5th and 6th grade students in clinical clerkship to obtain basic knowledge and problem-solving abilities in hematology as well as general internal medicine. The Department is also actively involved in training about 24 junior residents every year to acquire clinical skills in hematology and internal medicine and about 4 senior residents to practice diagnosis and treatment of various hematological disorders and to obtain the certificate for hematology specialist. As a division in the Graduate School of Medical and Dental Sciences, the Department is actively involved in education of 6 to 8 graduate students, who participate in the research projects listed above, to obtain the Ph. D. degree in medicine.

(4) Lectures & Courses

The major objective of the course is to understand the pathophysiology of blood cells, blood cell-forming organs, and hemostasis to provide a basis for rational diagnosis and treatment of their disorders.

(5) Clinical Services & Other Works

The Department of Hematology provides diagnosis and treatment for hematological diseases, such as leukemia, malignant lymphoma, anemia, and thrombocytopenia, with chemotherapeutics, molecularly-targeted drugs, immunosuppressive agents, and hematopoietic cell trans-plantation.

(6) Clinical Performances

We provide the highest quality of patient care for a wide spectrum of blood diseases and cancers.

(7) Publications

[Original Articles]

1. Erika Onozawa, Haruna Shibayama, Ken-Ichi Imadome, Akiho Tsuzura, Takatoshi Koyama, Osamu Miura, Ayako Arai. Inflammatory cytokine production in chronic active Epstein-Barr virus infection. Rinsho Ketsueki. 2017.03; 58(3); 189-196


4. Masahide Yamamoto, Ken Watanabe, Tetsuya Fukuda, Osamu Miura. Prediction of Prognosis for Patients with Diffuse Large B-Cell Lymphoma Refractory to or in First Relapse After Initial R-CHOP Therapy: A Single-Institution Study. Anticancer Res.. 2017.05; 37(5); 2655-2662

5. Masayuki Shiseki, Chikashi Yoshida, Naoki Takezako, Akira Ohwada, Takashi Kumagai, Kaichi Nishiwaki, Akira Horikoshi, Tetsuya Fukuda, Hina Takano, Yasuji Kouzai, Junji Tanaka, Satoshi Morita, Junichi Sakamoto, Hisashi Sakamaki, Koiti Inokuchi. Dasatinib rapidly induces deep molecular response in chronic-phase chronic myeloid leukemia patients who achieved major molecular response with detectable levels of BCR-ABL1 transcripts by imatinib therapy. Int. J. Clin. Oncol.. 2017.05; 22(5); 972-979


17. Keigo Okada, Ayako Nogami, Shinya Ishida, Hiroki Akiyama, Cheng Chen, Yoshihiro Umezawa and Osamu Miura. FLT3-ITD induces expression of Pim kinases through STAT5 to confer resistance to the PI3K/Akt pathway inhibitors on leukemic cells by enhancing the mTORC1/Mcl-1 pathway Oncotarget. 2017.12; 9; 8870-8886

2. Erika Onozawa, Haruna Shibayama, Sho Aoki, Aiho Tuzura, Ken-ich Imadome, Takatoshi Koyama, Osamu Miura, Ayako Arai. STAT3 is constitutively activated and can be a therapeutic target of JAK inhibitors in chronic active Epstein-Barr virus infection. The 22th Congress of European society of Hematology 2017.06.23 Madrid

3. Tetsuya Fukuda. The benefit and optimal patients for Radioimmunotherapy. The 57th annual meeting of Japanese Society for lymphoreticular Tissue Research 2017.07.01 Tokyo


7. Ryoto Yoshimoto, Ken Watanabe, Emi Uchida, Shihoko Suwa, Shuji Tohda, Masahiko Hatano, Miura Osamu, Tetsuya Fukuda. IVNSIABP/Nd1 is highly expressed in refractory lymphoma as a novel therapeutic target molecule. The 79th Annual Meeting of the Japanese Society of Hematology 2017.10.20 Tokyo


Molecular Endocrinology and Metabolism

Associate Professor: Takanobu Yoshimoto, Hajime Izumiyama
Assistant Professor: Isao Minami, Kazutaka Tsujimoto, Yasutaka Miyachi, Clinical Fellow: Hideyuki Okuma, Akira Takeuchi, Tomohito Hayashi, Masahiro Ando, Sayo Koseki Resident: Hiroto Yamashita, Aki Saito
Project Assistant Professor: Misa Saito, Xunmei Yuan
Michiko Shirakawa, Ibuki Shirakawa
Graduate Students (Doctor’s course): Kumiko Shiba, Kenichi Kawahori, Maki Kawasaki, Toshihiro Goto, Takuya Ohmura, Megumi Hatano, Yujiro Nakano, Takato Takeuchi, Masahiro Asakawa, Nozomi Hanzawa, Tatsuya Fukuda, Takahiro Fukaishi
Project Associate Professor: Koshi Hashimoto, Kyoko Shirakabe

1Department of Organ Network and Metabolism, 2Department of Preemptive Medicine and Metabolism

(1) Outline

1. Purpose of Education
Our training program enables postdoctoral trainees to prepare for the future academic careers and the clinical practice in the broad discipline of endocrinology and metabolism. The research program provides mentor-based training in experimental design, laboratory and clinical research techniques and methodology, and interpretation and analysis of the results obtained from cellular and molecular biology, physiology, clinical physiology, clinical therapeutics, and health sciences. This training program is designed to educate and establish ‘physician-scientist’ in the field of endocrinology and metabolism.

2. Research Subjects
1) Role of adipose tissue inflammation in the metabolic syndrome
2) Molecular mechanisms of saturated fatty acid-induced chronic inflammation
3) Molecular mechanism of vascular injury in diabetes, endocrine and metabolic diseases
4) Role of epigenetic regulation in metabolism
5) Mechanism of pathogenesis in endocrine tumors
6) Development of novel diagnostic and therapeutic tools in endocrine and metabolic diseases

3. Clinical Services
Comprehensive inpatient and outpatient services in the area of endocrine and metabolic disorders, including:
1) diseases of the thyroid, pituitary and adrenal glands.
2) diabetes mellitus, diabetic complications, metabolic syndrome, and obesity
3) primary and secondary hypertension
4) disorders of calcium metabolism
(2) Publications

[Original Articles]


Hepatobiliary and Pancreatic Surgery

Director & Professor
Minoru Tanabe MD, PhD

Lecturer
Atsushi Kudo MD, PhD

Assistant Professor
Takanori Ochiai MD, PhD
Daisuke Ban MD, PhD
Arihiro Aihara MD, PhD
Satoshi Matsumura MD, PhD
Yusuke Mitsunori MD, PhD
Satoshi Matsumura MD, PhD
Hiromitsu Ito MD (Center for Minimally Invasive Surgery) (since April)
Taku Sato MD (Bioresource Research Center)(until September)

Graduate School Students
Hiromitsu Ito MD (until March)
Eriko Katsuta MD (until March)
Keisuke Nakao MD (until March)
Takaki Furuyama MD (until March)
Keiichi Akakhoshi MD
Atsushi Ohiba MD
Yasuhiro Iwao MD (joining April)
Hiroki Ueda MD
Yoshiteru Ohata MD
Taku Sato MD (since October)
Yuki Mizuno MD
Norimichi Chiyonobu MD
Haku Liu MD
Shuichi Watanabe (joining April)
Yoshiya Ishikawa (joining April)

(1) Outline

The department of Hepato-Biliary-Pancreatic Surgery at Tokyo Medical and Dental University focus on the liver, biliary tract and pancreas with benign and malignant disorders. We constantly strive to provide the highest level of complex and innovative surgical care, comprehensive surgical training for tomorrow’s leaders as well as groundbreaking basic science and clinical research.

(2) Research

We conduct medical research in both clinical and laboratory settings and develop novel ideas in research which impact patient outcomes, teaching, and clinical care.

Our research programs encompass:
- Biomolecular mechanisms of carcinogenesis, cancer growth, invasion and metastasis
- Molecular target therapy for malignant diseases
Advanced Therapeutic Sciences

- Cancer stem cell
- Extended indication for hepatectomy
- The system of liver microcirculation
- Laparoscopic surgery for hepatobiliary pancreatic diseases
- Liver transplantation and organ preservation
- Treatments for neuroendocrine tumor
- Innovation of imaging modality for hepatobiliary pancreatic diseases

(3) Education

Medical students program:
We conduct the various experiences of hepatobiliary pancreatic diseases, diagnosis and management, through lectures, pre-clinical clerkship and clinical clerkship. Clinical clerkship exposes students to the surgical patients and basic surgical techniques. It also provides opportunities to participate in peri-operative care as well as operative procedures. Students learn interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Surgical training program:
The aim of our surgical training program cultivates not only training for certified board surgeons, but also the future surgical leaders, through experiences from the academic, the operative, and the outpatient aspects of management in university hospital and affiliated hospitals. Clinically, the trainees receive training and experience in the preoperative, operative, and post-operative care of patients and basic science and clinical research in our training programs strive to help young surgeons develop both technical and cognitive expertise.

(4) Clinical Performances

Our highly experienced surgeons offer state-of-the-art diagnosis and treatment, such as the multidisciplinary treatments (based on radical surgery) for advanced malignant diseases, minimally invasive procedures (including reduced port surgery).
Annually, 255 operations (hepatectomy: 96 cases, pancreatectomy: 73 cases) were performed in 2014, placing one of the top high volume medical centers in the country for hepatobiliary pancreatic surgery.

(5) Publications

[Original Articles]


3. Atsushi Oba, Atsushi Kudo, Keiichi Akahoshi, Mitsuhiro Kishino, Takumi Akashi, Eriko Katsuta, Yasuhito Iwao, Hiroaki Ono, Yusuke Mitsumori, Daisuke Ban, Shinji Tanaka, Yoshinobu Eishi, Ukihide Tateishi, Minoru Tanabe. A simple morphological classification to estimate the malignant potential of pancreatic neuroendocrine tumors. J. Gastroenterol.. 2017.05; 52(10); 1140-1146

4. Keiichi Akahoshi, Takanori Ochiai, Ayumi Takaoka, Takuya Kitamura, Daisuke Ban, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Emergency Cholecystectomy for Patients on Antiplatelet Therapy. Am Surg. 2017.05; 83(5); 486-490


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[Conference Activities & Talks]


4. Minoru Tanebe. Knack for Whipple operation; a better understanding of Treitz ligament and vascular anatomy. TAIWAN SURGICAL ASSOCIATION 2017.03.19 Taiwan

5. Minoru Tanebe. Pancreatic neuroendocrine tumor (PNET): current status and future perspectives . TAIWAN SURGICAL ASSOCIATION 2017.03.19 Taiwan


7. Daisuke Ban, Minoru Tanabe. How to set up difficulty scoring system in laparoscopic liver resection . 6th A-PHPBA & 29th JSHBPS 2017.06.07 Yokohama

8. Shuichi Watanabe, Daisuke Ban, Yasuhito Iwao, Keiichi Akahoshi, Akihiro Ono, Yusuke Mitsunori, Satoshi Matsumura, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Study of the prognosis of recurrent pancreatic cancer: The significance of the solitary recurrence. 2017.06.08

9. Atsushi Kudo, Daisuke Ban, Keiichi Akahoshi, Yusuke Mitsunori, Shinji Tanaka, Minoru Tanabe. Systemic therapy may decide surgical indication for patients with Unresectable of Metastatic Pancreatic Neuroendocrine Tumor. 6th A-PHPBA & 29th JSHBPS 2017.06.08

10. Yusuke Mitsunori, Daisuke Ban, Hiroaki Ono, Keiichi Akahoshi, Yasuhito Iwao, Satoshi Matsumura, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Can we predict postoperative diabetes mellitus in patient with distal pancreatectomy?. 6th A-PHPBA 29th JSHBPS 2017.06.08 Yokohama

12. Atsushi Kudo, Daisuke Ban, Keiichi Akahoshi, Satoshi Matsumura, Yusuke Mitsunori, Yasuhito Iwao, Shinji Tanaka, Minoru Tanabe. How to manage liver metastases of pancreatic NET?. 6th A-PHPBA & 29th JSHBPS 2017.06.08 yokohama

13. Takehiro Okabayashi, Daisuke Asano, Keiichi Akahoshi, Hiroaki Ono, Yusuke Mitsunori, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. The optimal management depending on the features of CT imaging of borderline resectable pancreatic cancer. 6th A-PHPBA & 29th JSHBPS 2017.06.09 yokohama


15. Daisuke Ban. Meet the Experts 12 / Reduced Accesses Cholecystectomy. 6th A-PHPBA & 29th JSHBPS 2017.06.09 yokohama


17. Yuki Mizuno, Atsushi Kudo, Yoshiya Ishikawa, Shuichi Watanabe, Norimichi Chiyonobu, Hiroaki Ono, Satoshi Masumura, Yusuke Mitsunori, Daisuke Ban, Takanori Ochiai, Minoru Tanabe. Analysis of the relationship between PD-L1 expression and clinicopathological factors in GEP-NETs. 6th A-PHPBA & 29th JSHBPS 2017.06.10 yokohama

18. Takehisa Yazawa, Hiroaki Ono, Yusuhito Iwao, Satoshi Matsumura, Yusuke Mitsunori, Daisuke Ban, Takanori Ochiai, Atsushi Kudo, Shinji Tanaka, Minoru Tanabe. Clinical significance of enhancing nodules in preoperative imaging studies of IPMN. 6th A-PHPBA & 29th JSHBPS 2017.06.10 yokohama

19. Jun Yoshiono, Daisuke Ban, Atsushi Kudo, Minoru Tanabe. The safe resection of liver parenchyma in laparoscopic surgery by CUSA with soft coagulation technique. The 63rd Annual Congress of International College of Surgeons Japan Section 2017.06.17

20. Toshiro Ogura, Daisuke Ban, Jun Yoshino, Kosuke Ogawa, Hiroaki Ono, Yusuke Mitsunori, Atsushi Kudo, Minoru Tanabe. Tips for the safe approach in laparoscopic liver resection of segment 7 and 8. The 63rd Annual Congress of International College of Surgeons Japan Section 2017.06.17

21. Daisuke Ban, Jun Yoshino, Toshiro Ogura, Kosuke Ogawa, Hiroaki Ono, Yusuke Mitsunori, Atsushi Kudo, Minoru Tanabe. Safely expanding of the laparoscopic liver resection according to difficulty scoring system. The 63rd Annual Congress of International College of Surgeons Japan Section 2017.06.17 Tokyo


24. Minoru Tanabe. SILS Laparoscopic cholecystectomy. IRCAD TAIWAN 2017.11.27 Taiwan

25. Minoru Tanabe. Prerecorded LIVE case: Single Port laparoscopic cholecystectomy. IRCAD TAIWAN 2017.11.27 Taiwan
Orthopaedic and Spinal Surgery

Professor: Atsushi Okawa
Associate Professor: Toshitaka Yoshii
Junior Associate Professor: Hiroyuki Inose,
Assistant Professor: Yuko Segawa, Koji Fujita, Takashi Hirai, Hirotaka Koyanagi, Masato Yuasa

Department of Orthopaedic and Trauma Research
Associate Professor: Shinichi Sotome, Yoshinori Asou
Junior Associate Professor: Yoto Oh

Joint Research Department of Advanced Medical Technology
Specially Appointed Professor: Shigenori Kawabata

(1) Outline
Members of our section and Orthopaedic Joint Surgery section work together in a clinic and OR. Through these practices we train to make the clinical diagnosis and to plan the adequate surgery. We study findings of clinical problem of the locomotorium lesion such as joints, spine and spinal cord, peripheral nerve disorders, aging, injury, tumorigenesis mechanism, and image findings. To solve a lot of clinical question and develop new methodology to treat patients having severe orthopaedic problems, we especially research spinal cord function, bone regeneration, and pain perception mechanism at dorsal root ganglion.

(2) Research
Research themes:
Bone and cartilage metabolism
Development and evaluation of biomaterials for clinical application
Mechanism of spinal ligament ossification
Development of measuring device for spinal cord magnetic signals
Research of bone and spinal metastatic tumors

We collaborate with other sections in our university such as the Clinical Anatomy, the Neurology, and the Physiology and Cell Biology.

(3) Education
Our department has several regular program such as 'Bedside Professor Round' at Monday 14:30-16:30, 'Clinical Conference' at Monday 7:30-9:00, and 'Journal Clubs or Research Progress meeting' at 7:30-8:00 of Tuesday, Thursday, and Friday.
Graduate students in our department can acquire the basic techniques of orthopaedic research and can learn a up-dated knowledge of clinical medicine through regularly-held journal clubs and research meetings.

Outline Members of our section and Orthopaedic Joint Surgery section work together in a clinic and OR. Through these practices we train to make the clinical diagnosis and to plan the adequate surgery. We study findings of clinical problem of the locomotorium lesion such as joints, spine and spinal cord, peripheral nerve disorders, aging, injury, tumorigenesis mechanism, and image findings. To solve a lot of clinical question and develop new methodology to treat patients having severe orthopaedic problems, we especially research spinal cord function, bone regeneration, and pain perception mechanism at dorsal root ganglion.

Research
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Lectures & Courses

Japanese orthopaedic research is characterised by the fact that orthopaedic surgeon himself participates experiments while he is working as a clinician. A lot of new knowledge concerning bone, cartilage and nerve were discovered by this so-called 'surgeon scientist'.

We have already taken a new artificial bone developed in our section to the market and have been preparing a revolutionary measuring device for spinal magnetic signals. We think it very important that research by a surgeon should be based on clinical problems even when methodology of molecular biology is used.

Our graduate students learn basic technique of orthopaedic research and also acquire the ability of life-continuing attitude for clinical studies.

Clinical Services & Other Works

Our orthopaedic department consists of two graduate school sections, the Orthopaedic and Spinal Surgery and the Joint Surgery and Sports Medicine. We deal with all kinds of orthopaedic diseases such as spine, hand, hip, knee, and musculo-skeletal disorder. More than twenty registered orthopaedic surgeons belong to our department.

Our anterior cervical operation for OPLL results in a good clinical outcome. We also organize many spinal surgeons who are members of a nation-wide research organization for spinal ligament ossification supported by the Ministry of Health, Labour and Welfare.

Clinical Performances

We aim to provide safer surgery to the patients with intractable spinal disease using many kinds of modality as navigation, microscopic surgery, spinal cord monitoring, and intraoperative CAT scan. Treatments of adult spinal deformity and osteoporotic vertebral fracture are our other interest. We have also developed an original artificial bone composed of hydroxyapatite and collagen, now promoting to use aggressively to fill large bone defect.

Publications

[Original Articles]


4. Jinno Tetsuya, Koga Daisuke, Asou Yoshinori, Morita Sadao, Okawa Atsushi, Muneta Takeshi. Intraoperative evaluation of the effects of femoral component offset and head size on joint stability in total hip arthroplasty. J Orthop Surg (Hong Kong). 2017.01; 25(1); 2309499016684298


13. R Takada, T Jinno, D Koga, K Miyatake, T Muneta, A Okawa. Comparison of wear rate and osteolysis between second-generation annealed and first-generation remelted highly cross-linked polyethylene in total hip arthroplasty. A case control study at a minimum of five years. Orthop Traumatol Surg Res. 2017.06; 103(4); 537-541


17. Oh Yoto, Fujita Koji, Wakabayashi Yoshiaki, Kurosa Yoshiro, Okawa Atsushi. Location of atypical femoral fracture can be determined by tensile stress distribution influenced by femoral bowing and neck-shaft angle: a CT-based nonlinear finite element analysis model for the assessment of femoral shaft loading stress. Injury. 2017.12; 48(12); 2736-2743


[Misc]

1. Y. Adachi, J. Kawai, Y. Haruta, M. Miyamoto, S. Kawabata, K. Sekihara, G. Uehara. Recent advancements in the SQUID magnetospingram system, Supercond Sci Tech. 2017.03; Vol30; 63001

2. Taishi Watanabe, Shigenori Kawabata, Miho Akaza, Yoshiaki Adachi, Kensuke Sekihara, Atsushi Okawa. Combination of neurophysiological and the morphological information in brachial plexus using SQUID biomagnetometer system. ACNS 2017 2017.02.08 Arizona PHOENIX

3. Shigenori Kawabata, Shuta Ushio; Takumi Yamaga; Yuki Hasegawa; Taishi Watanabe; Kensuke Sekihara; Yoshiaki Adachi; Atsushi Okawa; Shuta Ushio; Takumi Yamaga; Yuki Hasegawa; Taishi Watanabe; Kensuke Sekihara; Yoshiaki Adachi; Atsushi Okawa. Diagnosis of Spinal Conduction Block by Magnetospinography. ACNS 2017 2017.02.08 Arizona PHOENIX

4. Satoshi Sumiya, Shigenori Kawabata; Shuta Ushio; Yoko Hoshino; Kensuke Sekihara; Taishi Watanabe; Takumi Yamaga; Yoshiaki Adachi; Hiromichi Komori; kenichi Shinomiya; Atsushi Okawa. Noninvasive evaluation by magnetospinography of electrophysiological activity in the cervical spine after peripheral nerve stimulation. ACNS 2017 2017.02.08 Arizona PHOENIX


8. Satoru Egawa, Wei Xue Tao, Toshitaka Yoshii, Hiroaki Yasuda, Rempei Matsumoto, Atsushi Okawa, Shinichi Sotome. Repair of Femoral Bone Defects in Rats Using Hydroxyapatite/Collagen (HAp/Col) with BMP-2. ORS 2017.03.19 San Diego, USA

9. Rempei Matsumoto, Wei Xue Tao, Toshitaka Yoshii, Hiroaki Yasuda, Atsushi Okawa, Shinichi Sotome. Transplantation of Paclitaxel Impregnation Hap/Col to Bone Metastasis Model Rat. ORS 2017.03.19 San Diego, USA

10. Toshitaka Yoshii, Takashi Hirai, Tsuyoshi Yamada, Akio Iwanami, Kazuhiro Takeuchi, Kanji Mori, Atsushi Okawa, Yoshiharu Kawaguchi. Co-existence of ossification of the nuchal ligament is associated with spinal hyperostosis in patients with cervical ossification of the posterior longitudinal ligament - A Multicenter CT study-. ORS 2017.03.19 San Diego, USA

11. Yoshihiko Toshitaka, Hirai Takashi, Inose Hiroyuki, Yamada Tsuyoshi, Kawabata Shigenori, Okawa Atsushi. Intraoperative evaluation using mobile computed tomography in anterior cervical decompression for ossification of the posterior longitudinal ligament. 90th Annual Meeting of JOA 2017.05.18 Sendai

12. Inose Hiroyuki, Yamada Tsuyoshi, Hirai Takashi, Yoshii Toshitaka, Kawabata Shigenori, Okawa Atsushi. Bone turnover markers as a new predicting factor for non-union after spinal fusion surgery. 90th Annual Meeting of JOA 2017.05.18 Sendai


16. Yasuhiro Shirai, Taishi Watanabe, Yuki Hasegawa, Kensuke Sekihara, Shigenori Kawabata. Noninvasive evaluation of electrical activity in left atrium and pulmonary vein using SQUID system: Comparison between before and after pulmonary vein isolation.. Biomagnetic Sendai 2017 2017.05.22 Sendai


18. Taishi Watanabe, Kensuke Sekihara, Isamu Ozaki, Shigenori Kawabata, Atsushi Okawa. Removal of stimulation artifact noise near the measurement site using CSP. Biomagnetic Sendai 2017 2017.05.22 Sendai

19. Isamu Ozaki, Taishi Watanabe, Miko Akaza, Yoshiaki Adachi, Shigenori Kawabata, Kensuke Sekihara. Magnetic recordings of sensory action currents along the peripheral nerves at hand, forearm or upper arm and the brachial plexus. Biomagnetic Sendai 2017 2017.05.22 Sendai


21. Ryohei Takada, Tetsuya Jinno, Kazumasa Miyatake, Takeshi Muneta, Atsushi Okawa. Comparison Of Wear Rate And Osteolysis Between Second-Generation Annealed And First-Generation Remelted Highly Cross-Linked Polyethylene In Total Hip Arthroplasty. 15th EFORT 2017.05.31 Viena

22. Koji Fujita, Hitoshi Kaburagi, Akimoto Nimura, Takashi Miyamoto, Atsushi Okawa . Distal radius fracture patients over 70 years of age showed declined body balance ability and osteoporosis. Eurohand 2017 2017.06.21 Budapest, Hungary

23. Takuya Oyaizu, Mitsuhiro Enomoto, Masaki Horie, Kazuyoshi Yagishita. Hyperbaric and high-oxygen environments reduce circulating inflammatory cells, convert infiltrated macrophage phenotype, and activate satellites cell following skeletal muscle contusion in rats. . Undersea and Hyperbaric Medical Society (UHMS) 2017 Annual Scientific Meeting 2017.06.29 froilda, USA


27. Takahisa Ogawa, Yasuhiro Seki, Shinichi Shirasawa. Arthroscopic ganglionectomy of a toe with color-aided visualization of the ganglion stalk. 6TH Triennial IFFAS meeting 2017.09.29 Lisbon, Portugal

28. Koji Fujita, Hitoshi Kaburagi, Akimoto Nimura, Takashi Miyamoto, Atsushi Okawa. Distal radius fracture patients showed declined dynamic body balancing ability and Grip strength. 11th APFSSH 2017 2017.11.07 Cebu,Philippines


[Awards & Honors]
1. Biomagnetic Sendai 2017: Young Investigator Award (Taishi Watanabe), Biomagnetic, 2017.05
2. President’s awards: Best Resident/Trainee Oral Presentation (Oyaizu Takuya), Undersea and Hyperbaric Medical Society, 2017.06
3. ASBMR 2017 Annual Meeting: Young Investigator Award (Akira Takahashi), ASBMR, 2017.09
4. ASBMR 2017 Annual Meeting: Plenary Poster (Akira Takahashi), ASBMR, 2017.09
(1) Outline

While diagnostic radiology and nuclear medicine demand high-level capabilities and therefore extensive training to acquire those capabilities, keeping a watch on developments in medical knowledge and maintaining those skills is also an issue for these disciplines. Similarly, it is also necessary to maintain knowledge, skills and capabilities in ethics, not only radiology knowledge and skills, in order to respond to changes in medical practices as well as the social and political environment.

Contributing to the community is a basic responsibility of diagnostic radiology so it remains the university’s mission to unflinchingly fulfill its responsibility to provide high-level, advanced medical care, working toward resolution of community problems through education, research and medical activities, as well as to develop the diagnostic radiology professionals who will bear the responsibility for providing community medical care, and to develop professionals who have a global outlook and can flourish in this age of globalization. More than ever, advancing the fundamental medical concepts of “patient-oriented medical care” and “thorough medical safety management” are core principles in the field of diagnostic radiology and nuclear medicine, so continuing to maintain capabilities from this perspective is essential in daily practice.

Under the new radiologist system, it is possible to obtain a qualification by completing two years of postgraduate clinical training, followed by three years of general training at a training facility approved by the Japan Radiological Society, then sitting the radiologist examination (sixth year after graduation). After passing that examination, it is then possible to obtain a qualification in either radiotherapy or diagnostic radiology by completing a further two years of specialist training and sitting either the radiotherapist or the diagnostic radiologist examination (eighth year after graduation).

Diagnostic radiology and nuclear medicine was divided off the specialist field responsible for diagnostic radiology in July 2013. However, because the radiologist examination covers both treatment and diagnosis, the plan for the three years of general training is to provide it without dividing students into treatment or diagnosis streams. In compliance with the specialist training curriculum guidelines set out by the Japan Radiological Society, students generally complete about one year of training in the university, then about two years of training in an external affiliated hospital. There are currently 15 external affiliated hospitals approved by JRS as
training hospitals. When commencing specialist training, students are allocated to their specialist fields. After the two years of specialist training, all students decide whether to aim to become a radiotherapist or a diagnostic radiologist. Almost all then set out to obtain a further degree by enrolling in either a post-graduate school or adult graduate school. In addition, many also obtain certification as a senior (first class) radiation protection supervisor.

In recent times, diagnostic radiology has been experiencing an increasing load in terms of image processing, the number of image readings, and server storage, owing to improvements in instrument performance. As hybrid imaging such as PET/CT, SPECT/CT, PET/MRI become more prevalent, the diversification of diagnostic methods is accelerating. This trend is expected to continue, so there is a need for work on adequate personnel responses, including infrastructure improvement. And because the combined use of functional images to monitor metabolism and blood flow from morphologic images alone will be fundamental, it is essential that the university goes on enhancing education for radiologists so that they acquire the capabilities to extract and analyze clinically useful information from the complex data gathered.

Remote diagnostic imaging is a good example of this. In regard to its responsibility to contribute to the community, there have been changes in the way diagnostic radiology today has been active in society. The community gives special privileges to the diagnosing doctor, including the exclusive or primary responsibility to provide specified medical services. The university must unwaveringly fulfill its mission as such by providing advanced medical care through medical practice, as well as developing the doctors who will provide healthcare to communities. Although it could not be claimed that the environment surrounding diagnostic radiology in community healthcare has fully matured, as specialists, it is necessary to contribute to the development of local communities and to exercise the privileges granted as specialists: we should carry out our responsibilities while firmly holding to this approach.

(2) Research

Diagnostic specialists must keep up with the latest research in their fields, applying medical research findings to clinical practice, and making use of continuing education, continuing professional development programs, medical journals, society activities and the internet to maintain their skills. Along with the importance of maintaining awareness of how to interpret and apply research findings to the patient, it is also necessary to go on formulating broad education programs from a specialist perspective, in order to stay well informed about the fundamentals of research methods and to practice appropriate medicine. By managing the faculty effectively, it will go on clarifying radiological perspectives designed to effect inter-disciplinary research activities, taking a whole-university outlook that crosses over the limits of individual departments or graduate schools. The faculty ensures the education and research activities at graduate schools are reflected in the departments while also energetically tackling strategies to secure external funding and strengthen industry collaborations, with the aim of further improving research results. The faculty continues to actively advance international cooperative networks with the Radiological Society of North America (RSNA), the European Congress of Radiology (ECR), the Society of Nuclear Medicine and Molecular Imaging (SNMMI), etc. from the standpoint of diagnostic radiology and nuclear medicine, and continues to advance research based on a thorough awareness of the impacts emerging in the field and the potentialities developing in related practical application fields.

Diagnostic radiology provides diagnoses by extracting information about the morphology of organs and tissues, three-dimensional structures. It is important in terms of learning to systematically organize that information for comparison of imaging study analyses with the reference pathological tissue. Within that, using CT or MRI for tissue characterization that reflects the macro-pathology is important for identifying diseases.

Diagnostic radiology is a discipline in which it is possible to zero in on understanding of a pathological condition by collecting and analyzing blood flow and metabolic data over time. The faculty is continuing research into a minimally invasive method of extracting in vivo blood flow data to enable the use of in vivo dynamic analysis as a biomarker with formulation of dynamic scan protocols that obtain images over time with bolus contrast injection before high-resolution, multi-slice CT or high magnetic field MRI. Texture analysis and AI imaging are applied to both of anatomic and functional imaging modalities. We investigate from first order (kurtosis) to high order (NGLCM, NGTDM, GLSZM). The faculty is also formulating scan protocols that obtain images over time with 3D PET/CT, as a minimally invasive technique of extracting in vivo metabolic data. Known tracers include 18F-FDG (glucose metabolism), 11C-choline (lipid metabolism), 11C-acetate (lipid metabolism), 18F-FAPA (hydroxia), 18F-FABC (amino acid metabolism), 62/64Cu-ATSM (redox), 18F-FLT (DNA synthesis), 18F-NaF (bone metabolism), 68Ga-DOTATATE (somatostatin receptor), and 18F-Fluorobetapir (Amyloid), 18F-Flumetamol (Amyloid). The usefulness of multiple tracers in the discipline of oncology has been observed in numerous carcinomas. 177Lu-DOTATATE PRRT started as the first domestic Phase I study. Given
the need for examination with standardized imaging and assessment techniques, by conducting a multi-center joint study using PET/CT, the faculty is working to realize and to formulate methodologies for standardization to facilitate participation in global clinical trials in Japan.

(3) Education

In order to meet the expectations of both the patient and diagnostic radiologist, it is important to know the values, especially empathy, capabilities, and autonomy that lie at the core of medical care, and to continue to independently demonstrate them. Diagnostic radiology demands high-level capabilities, so extensive training is required to acquire those capabilities, while keeping a watch on developments in medical knowledge and maintaining those capabilities is also an issue for the discipline. Similarly, it is also necessary to maintain knowledge, skills and capabilities in ethics, not only radiology knowledge and skills, in order to respond to changes in medical practices as well as the social and political environment.

Education in the department aims to develop professionals equipped with the capabilities to resolve a range of problems and the attitude to identify and research topics themselves, by developing three subject groups, problem presentation, technical skill acquisition, and collaboration with the profession, and by formulating and implementing specialist education based on those groups, from the radiological perspective. Education in the postgraduate school aims to develop professionals who can resolve the problems faced by humanity from a global viewpoint, implementing research into leading-edge topics within a framework for research guidance under numerous teachers in addition to the acquisition of specialist knowledge, delivering education that develops inventive and practical research capabilities, from the radiological perspective. An essential aspect of postgraduate school education is the ongoing maintenance of capabilities from that perspective.

Under the new radiology specialist system, it is possible to obtain a qualification by completing two years of post-graduate clinical training, followed by three years of general training at a training facility approved by the Japan Radiological Society, then sitting the radiology specialist examination (sixth year after graduation). After passing that examination, it is possible to obtain a qualification in either radiotherapy or diagnostic radiology by completing a further two years of specialist training and sitting either the radiotherapist or the diagnostic radiologist examination (eighth year after graduation).

In July 2013, radiation oncology was divided into diagnostic radiology and nuclear medicine responsible for diagnostic radiology and radiotherapeutic oncology, in turn responsible for radiotherapy. However, because the radiologist examination covers both treatment and diagnosis, the plan for the three years of general training is to provide the training without dividing students into treatment or diagnosis streams. In compliance with the specialist training curriculum guidelines set out by the Japan Radiological Society, students generally complete about one year of training in the university, then about two years of training in an external affiliated hospital. There are currently 11 external affiliated hospitals (five in Tokyo and six in the Kanto region) approved by the Society as training hospitals. When students commence specialist training, they will be allocated to their specialist fields. After the two years of specialist training, all students decide whether to aim to become a radiotherapist or a diagnostic radiologist. Almost all students then set out to obtain a further degree by enrolling in either a post-graduate school or adult graduate school. From the standpoint of managing sealed and unsealed sources in nuclear medicine, many students also obtain certification as a senior (first class) radiation protection supervisor before engaging in clinical and research work.

(4) Lectures & Courses

The department delivers education based on the university’s fundamental policy aimed at realization of its mission: to contribute to the development of society, with a specific mission to bear the responsibility for the basic functions of education, research and medical care. As a department at the core of medical care, it develops professionals who can engage in practice across different fields, taking the approach that the standards of behavior demonstrated by diagnostic radiologists in clinical practice have far more impact than the formal curriculum in ethics.

The department develops professionals who can continue to work to resolve the issues faced by the university hospital, professionals who know the values, especially empathy, capabilities, and autonomy that lie at the core of medical care to meet the expectations of both the patient and student, can independently demonstrate them, and can flourish while maintaining a global outlook. Education in the department aims to develop professionals equipped with the capabilities to resolve a range of problems and the attitude to identify and
research topics themselves, by developing three subject groups, problem presentation, technical skill acquisition, and collaboration with the profession, and by formulating and implementing specialist education based on those groups, from the radiological perspective. Education in the postgraduate school aims to develop professionals who can resolve the problems faced by humanity from a global perspective, implementing research into leading-edge topics within a framework for research guidance under numerous teachers in addition to the acquisition of specialist knowledge, delivering education that develops inventive and practical research capabilities, from the radiological perspective.

(5) Clinical Services & Other Works

Diagnostic Radiology
- CT: A total of three CT scanners are involved in diagnostic radiology: two in the radiology department (64-slice MDCT) and one in the ER center (16-slice MDCT). Not only has the number of examinations using MDCT increased, but it has been possible to obtain improved diagnostic performance by reading MPR (multi-planar reconstruction) images and 1-mm thick images.
- MRI: A total of four MRI scanners are involved in diagnostic radiology: two 1.5-tesla scanners and two 3-tesla scanners. This has allowed for an increase in examinations.
- Ultrasound: The main examinations carried out by diagnostic radiologists are breast and abdominal examinations.
- Angiography and Interventional Radiology (IVR): In the vascular area: TAE for hepatic carcinoma, PTA and stent placement for occlusive arterial disease, intraarterial injection for pelvic tumor, and emergency hemostasis for ER center patients. In the non-vascular area: mainly CT-guided chest biopsy, breast mass biopsy and lymph node biopsy.

Nuclear Medicine
- Since the department began operating its second PET/CT scanner in November 2006, it has been conducting 15 to 16 PET examinations per day, mainly for malignant tumor, as well as eight to 10 general radioisotope examinations per day, mainly brain and myocardial SPECT. PET/CT for radiation planning and C-11 acetate PET/CT for hematologic malignancies were introduced in 2016.

(6) Clinical Performances

Being a core diagnosis and treatment department, diagnostic radiology and nuclear medicine is a department that engages in inter-disciplinary clinical practice forming strong partnerships to meet the needs of its internal client departments and works to resolve issues faced by the university hospital, bearing its responsibility to unswervingly fulfill its mission from a global perspective. Diagnostic radiology and nuclear medicine is equipped with the capabilities to process large volumes of imaging information, it develops problem presentation, technical skill acquisition, and collaboration with all departments, and possesses the characteristics to go on conscientiously tackling new modalities, probes and contrasts as well as clinical trials.

(7) Publications

[Original Articles]

Gastroenterologists and Radiologists: A Nationwide Multicenter Study in Japan. Am J Gastroenterol. 2017.01; 112(1); 163-171


[Books etc]


[Conference Activities & Talks]


3. Kazunori Kubota, Tomoyuki Fujioka, Akira Toriihara, Ukihide Tateishi, Yukihisa Saida. FDG-PET/CT Pitfalls in Breast Cancer. ECR 2017 2017.03.03

4. Kazunori Kubota, Tomoyuki Fujioka, Akira Toriihara, Yukihisa Saida, Ukihide Tateishi. Utility of 18F-FDG PET/CT and MRI imaging findings for predicting the clinicopathologic subtypes of triple negative breast cancer. ECR 2017 2017.03.04


7. Ukihide Tateishi. Special project for QIBA RSNA/QIBA: Nuclear Medicine. The 76th Annual Meeting of JRS 2017.04.16 Yokohama
8. Ukihide Tateishi. Diagnostic Imaging Guideline 2016 Revised Point of Nuclear Medicine Field. 76th Annual Meeting of JRS 2017.04.18 Yokohama

9. Yoshio Kitazume. Recent and emerging imaging techniques to evaluate IBD. The 6th asian congress of abdominal radiology 2017.04.21 Busan


11. Ukihide Tateishi. PET-CT reading seminar. PET-CT reading seminar 2017.05.20 Tokyo, Station Conference

12. Kazuma Toda, Akira Toriihara, Keiko Nakagawa, Mio Kojima, Takuya Nagano, Ukihide Tateishi, Ryotachi Yoshimura. Time Dependency of Volume-Based Metabolic Parameters Obtained by Dual-Time-Point TOF-PET/CT for Head and Neck Squamous Cell Cancer. ASTRO 59th annual meeting 2017.09.26 San Diego


Disease Genomics

Shumpei Ishikawa: Professor
Hiroto Katoh: Assistant Professor
Daisuke Komura: Assistant Professor
Hirofumi Nakanishi: Collaborative Researcher
Reiko Sato: Technical Assistant
Asami Yamamoto: Technical Assistant
Ryouhei Suzuki: Technical Assistant
Hiroki Konishi: Technical Assistant
Ken Tominaga: Technical Assistant
Keisuke Fukuta: Technical Assistant
Chihiro Tonegawa: Technical Assistant
Miharu Tamukai: Secretary

(1) Outline

Tumor tissue is a complex system composed of tumor cells and multiple types of stromal cells. Our purpose is to understand the dynamic multicellular interactions in such a complexed biological system by measuring a large amount of data at the genomic level, which leads the identifications of therapeutic targets and biomarkers. Another objective in the graduate course is to learn the applications, methods and interpretations of the disease genomics and to understand how to apply disease genomics to clinical fields through analyzing clinical human samples.

Laboratory Web site: http://www.tmd.ac.jp/english/gpat/

(2) Research

① Genomic approach for cancer - stromal interaction
② Cancer immunogenomics
③ Genomic analysis of clinical cancer samples
④ Functional genomic screening in cancer
⑤ Image analysis and machine learning in digital pathology

(3) Publications

[Original Articles]


[Misc]
2. Hiroto Katoh, Shumpei Ishikawa. Genomic and Immunological Profiles of Gastric Carcinoma BIO Clinica. 2017.08; 6(3); 41-46

[Conference Activities & Talks]
3. Shumpei Ishikawa. Genomic Pathology and Therapeutic Targets of Gastric Cancer. 89th Annual Meeting of the Japanese Gastric Cancer Association 2017.03.10 Hiroshima, Japan
4. Shumpei Ishikawa. Global analysis of Cancer-Stromal Interactome by PDX Transcriptome Sequencing. Humanized Mice and Patient Derived Xenografts in Individualized Medicine 2017.03.16 Yokohama, Japan


15. Hiroto Katoh, Daisuke Komura, Hiroki Konishi, Ryohei Suzuki, Asami Yamamoto, Masashi Fukayama, Hiroyuki Aburatani, Shumpei Ishikawa. Immunogenomic Repertoire Characterization of Tumor-infiltrating Lymphocytes in Gastric Carcinoma. The 12th International Workshop on Advanced Genomics 2017.06.27 National Center of Sciences, Tokyo, Japan

16. Shumpei Ishikawa. Global immunogenomic profiling and discovery of functional antigen receptors in gastric cancer. International Conference for Precision Cancer Medicine 2017.06.30 Akio Suzuki Memorial Hall, Medical Research Institute, Tokyo Medical and Dental University


Human Genetics and Disease Diversity

Professor, Toshihiro Tanaka
Project Assistant Professor, Ryo Watanabe

(1) Research

1) Elucidation of genetic architecture of human metabolic diseases using genome and meta-genome information
2) Identification of biomarkers for personalized medicine
3) Pharmacogenomics
4) Functional genomics
5) Statistical genetics and genome drug discovery

(2) Lectures & Courses

As we say “Every human is different”, human genetic diversity has essential impacts on clinical fields, e.g. disease risk, clinical efficacy, and drug responses. Our laboratory aims to elucidate the diversity of human being through comprehensive research activities including genome and epi-genome analyses of human diseases, methodological development of statistical genetics, and human resources cultivation to achieve personalized medicine.

(3) Publications

[Original Articles]


Association analyses of East Asian individuals and trans-ancestry analyses with European individuals reveal new loci associated with cholesterol and triglyceride levels. Hum. Mol. Genet.. 2017.05; 26(9); 1770-1784


[Conference Activities & Talks]

1. R. Watanabe et al. Identification of novel long QT syndrome-associated mutations by targeted sequencing analyses. European Human Genetics Conference 2017.05.27 Copenhagen, Denmark

2. Toshihiro Tanaka. Genomic Medicine and Cardiovascular Diseases. 2017.06.28

Applied Regenerative Medicine

Professor: Ichiro SEKIYA
Assistant Professor: Masafumi HORIE, Koji OTABE, Hisako KATANO
Project Assistant Professor: Nobutake OZEKI, Yusuke NAKAGAWA,
Mitsuru MIZUNO, Keiichiro KOMORI
Graduate Student: Kenta KATAGIRI, Yuji KONO, Naoto WATANABE,
Yoshihisa KUSHIDA, So SUZUKI, Akinobu HYODO,
Hayato AOKI, Mana NARITOMI
Technical Staff: Shizuka FUJII, Emi KODA, Atsuko TAKEBE,
Mika WATANABE
Assistant Clerk: Kimiko TAKANASHI

(1) Outline

Our purpose is to support and advance stem cell research and regenerative medicine for the discovery and development of cures, therapies, diagnostics and research technologies to relieve human suffering from chronic disease and injury.

(2) Research

1) Development of regenerative medicine with stem cells.
2) Realization and industrialization of cell and regenerative therapy.
3) Establishment of safety test for regenerative medicine.
4) Translational research.
5) Development of software for 3D analysis of knee MRI.

(3) Clinical Services & Other Works

Investigator initiated clinical trial “treatment for degenerative meniscus injury by autologous synovial stem cells” was started and cell transplantation was completed for 10 patients.

(4) Publications

[Original Articles]


7. Katagiri Kenta, Yu Matsukura, Takeshi Muneta, Nobutake Ozeki, Mitsuru Mizuno, Hisako Katano, Ichiro Sekiya.. Fibrous synovium releases higher numbers of mesenchymal stem cells than adipose synovium in a suspended synovium culture model. Arthroscopy. 2017.04; 33(4); 800-810

8. Mikio Shioda, Takeshi Muneta, Kunikazu Tsuji, Mitsuru Mizuno, Keiichiro Komori, Hideyuki Koga, Ichiro Sekiya. TNF α promotes proliferation of human synovial MSCs while maintaining chondrogenic potential. PLoS ONE. 2017.05; 12(5); e0177771


11. Yuji Kohno, Mitsuru Mizuno, Nobutake Ozeki, Hisako Katano, Keiichiro Komori, Shizuka Fujii, Koji Otabe, Masafumi Horie, Hideyuki Koga, Kunikazu Tsuji, Mikio Matsumoto, Haruka Kaneko, Yuji Takazawa, Takeshi Muneta, Ichiro Sekiya. Yields and chondrogenic potential of primary synovial mesenchymal stem cells are comparable between rheumatoid arthritis and osteoarthritis patients. Stem Cell Res Ther. 2017.05; 8(1); 115


15. Eriko Grace Suto, Yo Mabuchi, Nobuharu Suzuki, Koji Suzuki, Yusuke Ogata, Miyu Taguchi, Takeshi Muneta, Ichiro Sekiya, Chiihiro Akazawa. Prospectively isolated mesenchymal stem/stromal cells are enriched in the CD73(+) population and exhibit efficacy after transplantation. Sci Rep. 2017.07; 7(1); 4838


17. Hideyuki Koga, Toshifumi Watanabe, Masafumi Horie, Hiroki Katagiri, Koji Otabe, Toshiyuki Ohara, Mai Katakura, Ichiro Sekiya, Takeshi Muneta. Augmentation of the pullout repair of a medial meniscus posterior root tear by arthroscopic centralization 2017.08; 6(4); 1335-1339

19. Ichiro Sekiya, Darwin J.Prockop.. Beginning of an Unresolved Debate:Should Mesenchymal Stem Cells Be Expanded at Low Density to Preserve Early Progenitors? STEM CELLS 35Anniversary. 2017.09; 1; 36-37


[Conference Activities & Talks]

1. Ichiro Sekiya. Preclinical and Clinical Studies of Meniscus Regeneration by Synovial Stem Cells. Orthopaedic Research Society 2017 Annual Meeting 2017.03.19 SanDiego, USA

2. Naoto Watanabe, Mitsuru Mizuno, Jumpei Matsuda, Hisako Katano, Nobutake Ozeki, Koji Otabe, Keiichi Komori, Yuji Kono, Kenta Katagiri, Takeshi Muneta, Ichiro Sekiya.. Decellularization of the meniscus by high hydrostatic pressure: temperature condition for removal of cell debris.. Orthopaedic Research Society 2017 Annual Meeting 2017.03.20 SanDiego, USA

3. Mana Naritomi, Mitsuru Mizuno, Hisako Katano, Koji Otabe, Keiichi Komori, Shizuka Fujii, Nobutake Ozeki, Masafumi Horie, Kunikazu Tsuji, Takeshi Muneta, Ichiro Sekiya.. Recombinant peptide petaloid pieces enhance in vitro cartilage formation of mesenchymal stem cells. Orthopaedic Research Society 2017 Annual Meeting 2017.03.20 SanDiego, USA


6. Kenta Katagiri, Mitsuru Mizuno, Hideyuki Koga, Nobutake Ozeki, Yusuke Nakagawa, Yuji Kono, Koji Otabe, Masafumi Horie, Hisako Katano, Kunikazu Tsuji, Hideo Ono, Takeshi Muneta, Ichiro Sekiya.. Transplantation of Synovial Mesenchymal Stem Cells Enhances the Effect of Cetalization with Suture Anchor and Promotes Meniscus Regeneration for Extruded Meniscus After Partial Meniscectomy in Microminipigs. Orthopaedic Research Society 2017 Annual Meeting 2017.03.22 SanDiego, USA

7. Yuji Kono, Mitsuru Mizuno, Kenta Katagiri, Koji Otabe, Nobutake Ozeki, Hisako Katao, Keiichi Komori, Masafuji Horie, Kunikazu Tsuji, Mikio Matsumoto, Haruka Kaeko, Yuji Takazawa, Takeshi Muneta, Ichiro Sekiya.. Harvested cell number varies greater in RA than in OA after a suspended synovium culture. Orthopaedic Research Society 2017 Annual Meeting 2017.03.22 SanDiego, USA

[Awards & Honors]

1. Yusuke Nakagawa, Best Poster Presentation Award, Japanese Medical Society of America,Japan Society for the Promotion of Science, 2017.04
Minimally Invasive Medical Treatment

Professor KOJIMA Kazuyuki

(1) Outline

1. Investigation and research for the social needs identification of minimally invasive medical treatment in the next generation of the medical and the dental areas.
2. Medical equipment and development of treatment to meet the needs of minimally invasive medical treatment in the next generation of the medical and the dental fields.
3. Research and development of the education curriculum and evaluation methods of minimally invasive treatment in the medical and the dental fields.
4. Development and operation of minimally invasive treatment of industry-academia cooperation in the medical and the dental fields.
5. Development and operation of technology certification strategy of minimally invasive treatment in the medical and the dental areas.

(2) Publications

[Original Articles]


2. Inokuchi M, Murase H, Otsuki S, Kawano T, Kojima K. Different clinical significance of FGFR1-4 expression between diffuse-type and intestinal-type gastric cancer World J Surg Oncol. 2017.01; 15(1);


5. Keisuke Okuno, Kentaro Gokita, Toshiro Tanioka, Norihiro Ogawa, Sho Otsuki, Mikito Inokuchi, Toshiro Takayama, Kazuyuki Kojima. Esophagojejunostomy Using the Purse-String Suturing Device After Laparoscopic Total or Proximal Gastrectomy for Gastric Cancer World J Surg. 2017.04; published online;


12. M. Nakagawa, C. Tomii1, M. Inokuchi, S. Otsuki1, K. Kojima. Feasibility Of A Clinical Pathway With Early Oral Intake And Discharge For Laparoscopic Gastrectomy Scandinavian journal of surgery. 2017.12; Published online ;


[Conference Activities & Talks]


2. Kazuyuki Kojima. Esophagojejunostomy using a circular stapler with a purse-string suturing device. Korea International Gastric Cancer Week 2017 2017.03.25


5. Masatoshi Nakagawai, Mikito Inokuchi, Sho Otuki, Norihito Ogawa, Toshiro Tanioka, Kazuyuki Kojima. Is laparoscopic approach an effective tool for total gastrectomy to obese patients. 12th International Gastric Cancer Congress 2017.04.22


7. Kazuyuki Kojima. “JSES” accreditation system. Seoul National University Bundang Hospital 2017.05.17


Biomedical Devices and Instrumentation

Professor: Kohji Mitsubayashi
Junior Associate Professor: Takahiro Arakawa
Assistant Professor: Koji Toma
Lecturer (part-time): Kazuyoshi Yano

(1) Outline

Our research is based on a broad range of areas such as electrochemistry, mechanical engineering, electrical engineering, material science and biochemistry. The group aims to pursue interdisciplinary research in bio-MEMS, bio-optics, bio-electronics or bioinformatics by combining biotechnology and information technology.

(2) Research

1. Detachable “Cavitas sensors” as bioinformation monitoring systems in body cavities
   "Cavitas sensors" such as a soft contact-lens biosensor and a mouth guard biosensor have been developed for novel biomonitoring methods by using advanced polymer microelectromechanical systems (MEMS) techniques.

2. Biochemical gas sensor 'Bio-sniffers' and spatiotemporal gas visualization system “Sniff-camera” for volatile organic compounds from human body
   Highly selective gas sensors 'Bio-sniffers' and gas visualization systems "Sniff-camera" for acquiring spatiotemporal information of distribution of volatile chemicals have been developed by exploiting metabolizing enzymes in human liver. Potential applications of these gas sensors include halitosis analysis, breath alcohol and aldehyde measurement, medical screening or dental health, etc.

3. Immunosensors for medical treatment and environmental medicine
   Development of optical or surface acoustic wave immunosensors have been pursued for semi-continuos (rapid and repeated) measurement of antigens in body and airborne allergens in living environment.

4. “Organic engine” based on chemo-mechanical energy conversion
   A novel chemo-mechanical energy conversion system (organic engine) that utilizes enzyme reactions and active transport of chemicals have been constructed. Biomedical applications (chemical pumps, drug release systems, etc.) are also investigated.

(3) Education

In advanced medicine, technologies enabling to accurately measure biological information are highly demanded. The development of “human-friendly” non-invasive measurement methods could release patients from the pain and the risks of sampling. The students will learn the basic knowledge and skills of biological information measurement through the lectures (e.g., “Biomedical Device Science and Engineering”, “Practice in Global Linkage between University and Industry” and “Nanobiotechnology”), seminars and practical training. Especially research including biochemical measurement, the development of biosensing devices and their applications to medicine will be carried out based on “sensor and biomedical engineering.”
(4) **Lectures & Courses**

The students will learn the basic technology related to advanced medicine and biological information measurement. Through practical training, they will also engage in research activities for biochemical measurement, the development of biosensing devices and their applications to medicine based on “sensor and biomedical engineering”. The objective of this course is to help the students be able to think about and conduct a research by themselves throughout the activities with academic researches.

(5) **Publications**

[**Original Articles**]

1. Takahiro Arakawa, Toshiyuki Sato, Kenta Iitani, Koji Toma, Kohji Mitsubayashi. Fluorometric biosniffer camera “Sniff-cam” for direct imaging of gaseous ethanol in breath and transdermal vapor Analytical Chemistry. 2017.04; 89(8); 4495-4501


[**Books etc**]

[Conference Activities & Talks]

1. Mitsubayashi K. Cavitas sensors and sniff-imaging system for daily medicine. International Workshop on Nanodevice Technologies 2017 2017.03.02 Higashi-Hiroshima, Japan

2. Toma K, Arakawa T, Mitsubayashi K. Cavitas sensors into human cavities: soft-contact lens and mouth-guard sensors. 19th International Conference on Biomedical Device and Instrumentation Development (ICBDID 2017) 2017.03.26 Madrid, Spain


5. Mitsubayashi K. Cavitas biosensors using biocompatible polymer and MEMS techniques. MEMS Engineer Forum 2017 2017.04.26 Ryogoku, Tokyo

6. Chien PJ, Suzuki T, Tsujii M, Ming Y, Toma K, Arakawa T, Iwasaki Y, Mitsubayashi K. Gas phase biosensor (bio-sniffer) using S-ADH (secondary alcohol dehydrogenase) for exhaled isopropanol as a potential volatile biomarker. 5th International Conference on Bio-Sensing Technology 2017.05.07 Riva del Garda, Italy

7. Xie R, Seshima F, Toma K, Arakawa T, Mitsubayashi K. Air bio-battery with a gas/liquid diaphragm cell for medical and health care devices. 5th International Conference on Bio-Sensing Technology 2017.05.07 Riva del Garda, Italy

8. Toma K, Kishikawa C, Arakawa T, Mitsubayashi K. Regenerable and antibody-immobilized surface architecture on surface plasmon biosensor for continuous immunosensing. 5th International Conference on Bio-Sensing Technology 2017.05.07 Riva del Garda, Italy


11. Toma K, Kishikawa C, Arakawa T, Mitsubayashi K. Regeneratable surface plasmon resonance immunosensor for monitoring in medical care and environmental medicine. 9th International Conference on Molecular Electronics and Bioelectronics 2017.06.26 Kanazawa, Japan

12. Sato T, Iitani K, Toma K, Arakawa T, Mitsubayashi K. Sniff-cam (fluorometric gas-imaging system) with enzyme mesh for gaseous ethanol from human body (breath, skin). EuroAnalysis 2017 2017.08.28 Stockholm, Sweden


15. Toma K, Arakawa T, Mitsubayashi K. UV curable MPC polymer for stable enzyme immobilization on a mouthguard biosensor in saliva glucose monitoring. 3rd International Conference on Bioinspired and Zwitterionic Materials (ICBZM 2017) 2017.10.18 Kanagawa, Japan

16. Iitani K, Toma K, Arakawa T, Mitsubayashi K. Gas-imaging system “Sniff-cam” based on pH-dependent redox reaction of alcohol dehydrogenase for ethanol and acetaldehyde after drinking. Irago 2017 2017.11.01 Tokyo, Japan


19. Toma K, Yoshimura N, Arakawa T, Yatsuda H, Mitsubayashi K. Reusable immunosensors allowing semi-continuous measurement for clinical and environmental medicine. The 2nd International Symposium on Biomedical Engineering 2017.11.09 Tokyo, Japan


22. Mitsubayashi K. Sniff-cam (biochemical gas-imaging system) with enzyme mesh as artificial olfactory receptor for ethanol vapor from human body (breath, skin). EMN Mauritius Meeting 2017 2017.11.26 Port Louis, Mauritius


[Awards & Honors]

1. BEST PRESENTATION AWARD, WASET, World Academy of Science, Engineering and Technology, 2017.03
Implanted Flexible Neural Prostheses and MEMS by Dr. Chengkuo Lee, 190th IBB Seminar, 2017.05

Implanted flexible neural interfaces and MEMS devices currently become popular because they are considered as the viable solution to realize implanted prostheses for novel applications such as human-machine interface and electroceuticals.

'Mulling over the aromas of wine', American Chemical Society NEWS, 2017.07

Acetaldehyde is frequently found in a lot of places and foods, such as fruits, vegetables and human saliva. When present in high amounts in wine, it produces an unpleasant odor and affects the fermentation process. Therefore, it is important for winemakers to monitor the acetaldehyde levels, which can vary with temperature, pH and oxygen concentrations. Current methods involve trained experts, long processing times and complex equipment. Kohji Mitsubayashi and colleagues propose a sensitive, versatile detector that is more selective than its predecessors.
Biomedical Information

Professor Yoshikazu NAGAJIMA
Research Assistant Teruyo MORI
Graduate Student Yoshihiro SUGIO

(1) Research

1. Surgical Scene Recognition with Artificial Intelligence
2. Deep-Learning Segmentation and Annotation of Brain MRI volumes
4. Pneumatic Stiffness-Tunable Mechanism and its Application for Laparoscopic Surgeries

(2) Publications

[Original Articles]


[Conference Activities & Talks]

3. Kaneko T, Shimada J, Nomura F. Measurement of extracellular potential in single cardiomyocytes arranged on multi-electrode array with agarose microchambers. 9th international conference on Molecular Electronics and Bioelectronics (M&BE9) 2017.06.26 Kanazawa, Japan
4. Fujii K, Nomura F, Kaneko T. Response of single-cell-level-arranged cardiomyocyte networks on agarose microchamber by electrical stimulation. 9th international conference on Molecular Electronics and Bioelectronics (M&BE9) 2017.06.26 Kanazawa, Japan
6. Nakajima Y. Integration of sensing, Simulation and AI Analysis in Medicine. The 2nd International Symposium on Biomedical Engineering 2017.11.09 Tokyo
7. Nakajima Y. Artificial Intelligence and IoT in Medicine. 1st International Symposium on Frontier of Science, Technology and Engineering(FOSTE) 2017.11.20 Bangkok
Bioelectronics

Staff
Yuji Miyahara (Professor)
Akira Matsumoto (Associate Professor)
Tatsuro goda (Assistant Professor)
Miyuki Tabata (tenure track Assistant Professor)
Yukichi Horiguchi (Assistant Professor)
Toshihiro Yoshimura (Specially Appointed Assistant Professor)
Taiki Miyazawa (Project Assistant Professor)
Siyuan Chen (Collaborative Researcher)
Hiroko Matsumoto (Technical Assistant)
Yuki Morooka (Technical Assistant)
Chiharu Mizoi (Technical Assistant)
Sayo Kotaki (Technical Assistant)
Kayoko Nakagawa (Staff Assistant)
Ulala Minamibata (Staff Assistant)

Graduate student
Chindanai RATANAPORNCHAROEN, Hideki Fujisaki, Dilinaer AINIWAER, Hiroaki Hatano,
Chattarika KHAMHANGLIT, Maki Shikatani, Ayumu Tsuchiya

(1) Outline

Bioelectronics group is engaged in developing methodologies to determine and analyze functions of biomolecules and their relationships to diseases based on solid-state biosensor technology. Our interests include design & understanding of physicochemical properties of the interface between biomolecules and the device materials, signal-transduction mechanism as well as the pursuit of improved sensitivity and selectivity. These technologies involve many different disciplines of science and engineering, through which we propose new solutions to future medicine.

(2) Research

1. Bioelectronics for Next-generation DNA Sequencing
Our research is focused on the development of nano-interfaces between biomolecules and semiconducting materials for label-free and highly sensitive electrical monitoring of nucleotide base sequences and their amplification processes. The goal of the project is to provide a smaller and cheaper alternative next-generation DNA sequencer to the traditional techniques that involve optical sensing using fluorescence and biofluorescence.

2. Devices for Early Cancer Diagnosis
For applications to early-stage diagnostics of cancers, we aim to establish the device technology enabling detection of small amount of cancer markers out of blood samples with remarkable quickness and sensitivity. The focus is on the design of nano-interfaces that involves chemical modification of biomolecular targets as well as solid/liquid interfaces in order to achieve efficient biomolecular recognitions on the electrode surfaces. We also pursue optimized materials and the surface property of the electrode in order to obtain remarkably target-specific signals out of complicated electrical signals obtained from raw biological samples.

3. Discovering Intra/Extracellular Molecular Dynamics on Inflammatory Response
Molecular dynamics at inflammation and bacterial infection is investigated using biomimetic surfaces. The term
“biomimetics” in this context represents mimicking the interplay between biomolecules and local changes of microenvironment that has evolved as a mechanism for inauguration of immune responses. Our new nano-biotechnology will reveal unidentified active molecular dynamics in pathophysiology.

4. “Artificial Pancreas” to Treat Diabetes

Development of self-regulated insulin delivery systems to treat diabetes is a long-standing challenge of biomedical engineering. We propose a synthetic gel based solution, which could offer a remarkably simple, “electronics-free” and thus significantly low-cost alternative to the ongoing efforts of artificial pancreas.

(3) Education

1. Engagement: we are engaged in teaching a part of Biomedical Engineering course and mentoring master & doctor students.

2. Course objective: Serum components play crucial roles in metabolic cycles and their concentration homeostasis reflects dynamic equilibrium of life. On occasion of abnormal metabolic pathway, it is manifested as a fluctuation of each specific serum component. Our lecture provides an overview of advanced materials and engineering aimed at determination of body fluids including serum components and mechanisms for their concentration homeostasis.

3. Deepen knowledge of theory, mechanisms, methodologies, application, and limitation of detection technology for biomolecules in various clinical samples. Learn integrative technology of advanced materials/devices and biology/medicine, present problems and future perspective in bioelectronics. Familiarize each student with other related techniques, lab skills including planning of experiments, presenting research results and preparing reports.

(4) Publications

[Original Articles]

1. Tatsuro Goda, Yuji Miyahara. Calcium-independent binding of human C-reactive protein to lysophosphatidylcholine in supported planar phospholipid monolayers Acta Biomaterialia. 2017.01; 48; 206-214

2. Miyuki Tabata, Yurika Katayama, Fahmida Mannan, Ayaka Seichi, Koji Suzuki, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara. Label-free and electrochemical detection of nucleic acids based on isothermal amplification in combination with solid-state pH sensor Procedia Engineering. 2017.01; 168; 419-422

3. Miyuki Tabata, Yurika Katayama, Fahmida Mannan, Ayaka Seichi, Koji Suzuki, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara. Label-free and Electrochemical Detection of Nucleic Acids Based on Isothermal Amplification in Combination with Solid-state pH Sensor 2017.01; 168; 419-422


5. Yukichi Horiguchi, Tatsuro Goda, Akira Matsumoto, Hiroaki Takeuchi, Shoji Yamaoka, Yuji Miyahara. Direct and label-free influenza virus detection based on multisite binding to sialic acid receptors. Biosensors and Bioelectronics. 2017.02; 92; 234-240


12. Yuki Imaizumi, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara. Identification of types of membrane injuries and cell death using whole cell-based proton-sensitive field-effect transistor systems. Analyst. 2017.09; 142(18); 3451-3458


[Books etc]

[Misc]
1. Tatsuro Goda. Mimicking and Passing Plasma Membranes. Membrane. 2017.03; 42(3); 90-96

[Conference Activities & Talks]
1. Akira Matsumoto. Synthetic boronate gel-driven "closed-loop" insulin delivery system with feasible safety and efficacy in mic. 11th International Gel Symposium 2017.03.09

2. Tatsuro Goda, Yuji Miyahara. Chemical induction of cell membrane leakage measured under ammonia superfusion conditions using whole cell-based pH sensing transistors. 5th International Conference on Bio-Sensing Technology 2017.05.07 Riva Del Garda, Italy

3. Yuji Miyahara. Exploring Fusion between Life Science and Electronics. 1st International Symposium on Precision Medicine and Biomedical Technologies 2017.06.03 Carp City Hotel, Quanzhou, China


5. Yuji Miyahara, Akira Matsumoto, Tatsuro Goda, Miyuki Tabata. Functional gate-field effect transistors for electrically neutral molecules. Matrafured 2017 2017.06.11

7. Tatsuro Goda. Biomimetic engineering for biosensing and bioscience. The 9th International Conference on Molecular Electronics and Bioelectronics (M&BE9) 2017.06.26 Ishikawa Conert Hall


15. Yukichi Horiguchi, Tatsuro Goda, Akira Matsumoto, Hiroaki Takeuchi, Shoji Yamaoka, Yuji Miyahara. Label-free selective detection of influenza A virus subtype H1N1 using multisite binding of sialic acid receptors. The 15th International Conference on Advanced Materials (IUMRS-ICAM 2017) 2017.08.27


20. Miyuki Tabata, Enrico Tenaglia, Tatsuro Goda, Akira Matsumoto, Carlotta Guiducci, Yuji Miyahara. pH detecting devices for label-free electrochemical monitoring of isothermal nucleic acid amplification. The 2nd International Symposium on Biomedical Engineering 2017.11.09 Tokyo University


23. Miyuki Tabata, Enrico Tenaglia, Tatsuro Goda, Akira Matsumoto, Calotta Guiducci, Yuji Miyahara. pH detecting devices for label-free electrochemical monitoring of isothermal nucleic acid amplification. The 2nd International Symposium on Biomedical Engineering 2017.11.09


29. Miyuki Tabata, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara. Label-free electrochemical monitoring of isothermal nucleic acid amplification using micro pH sensors. 4th COINS symposium 2017.12.08 iCONN, Kawasaki

30. Miyuki Tabata, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara. Label-free electrochemical monitoring of isothermal nucleic acid amplification using micro pH sensors. 4th COINS symposium 2017.12.08
Material-Based Medical Engineering

Prof. Akio KISHIDA
Assoc. Prof. Tsuyoshi KIMURA
Assist. Prof. Yoshihide HASHIMOTO
Research Associate Naoko NAKAMURA

Division of Acellular Tissue and Regenerative Medical Material
Assoc. Prof. Seiichi FUNAMOTO
Lecturer Akitatsu YAMASHITA
Assist. Prof. Yongwei ZHANG

Secretary Naomi HIWATARI

Doctor Course Student Masaki WATANABE

(1) Outline

In our laboratory, we deal with many research topics from the fundamental study of biomaterials in terms of material engineering to the application study of the medical devices. The key words of our policy are 'contribution to medical care' and 'exploration of basic scientific principles'.

(2) Research

In order to develop technologies that contribute to the medical and dental care, there is a need for a system to build up the design concepts at the molecular level and to realize it. Based on polymer chemistry, organic chemistry, and physical chemistry, we proceed a research aimed at specific clinical applications using cell engineering, genetic engineering techniques. Target area are new medical material development, regenerative medicine, gene therapy, and the treatment engineering.

(1) Regenerative medicine using decellularized biological tissue

In order to remove the xenogeneic cells, the living tissue is decellularized using a new processing method, high-hydrostatic pressure (HHP) method has been developed. Using this process, complete removal of infectious bacteria, viruses, and cells was accomplished.

(2) Molecular aggregates formed by the high-hydrostatic pressure process

Hydrogen bond assembles molecular assembly under high pressure. Using the HHP processing of more than 6,000 atmospheres, we prepare the nucleic acid assembly and apply them as gene delivery system.

(3) Extracellular matrix remodeling

We are conducting research on tissue remodeling using artificially reconstructed extracellular matrix structure. Specifically, we are researching the application of as artificial skin and artificial cornea of precision design artificial extracellular matrix structure.
(4) Immune control system: technology of specific cell capture and release
In cancer immunotherapy, by removing regulatory T cells (Treg) that negatively regulates immune reactions, to be able to enhance the anti-tumor immune responses have been revealed. We are developing technologies to capture and recover Treg using interfacial science.

(3) Education
In the Graduate School of Medical and Dental Sciences, we provide the lectures entitled “biological functional materials science”, “applied biomaterials”, and “medical, dental and pharmaceutical industrial engineering”.

(4) Publications

[Original Articles]

[Misc]
1. Frontier of artificial corneas 2017.02; 54(1); 10-13
2. Biomaterials including tissues, organs and extracellular matrix obtained from animals 2017.02; 54(1); 6-9

[Conference Activities & Talks]
3. Akio Kishida. Biomedical application of decellularized tissues. ASAIO 63rd Annual Conference 2017.06.21 Chicago, USA

4. Naruki Kimura, Yoshihide Hashimoto, Seiichi Funamoto, Akio Kishida, Yongwei Zhang, Akitatsu Yamashita, Kei Oya, Takeo Nakano. Fabrication of visible marker on decellularized tissue for ultrasonography via reactive sputtering. 2017 TERMIS-EU Conference 2017.06.26 Davos, Switzerland

5. Tsuyoshi Kimura, Takaaki Kubota, Naoko Nakamura, Yoshihide Hashimoto, Akio Kishida. Preparation of ICD induced cancer cells and activation of immune system. iLIM-2 2017.09.29 Nagoya, Japan


11. Naruki Kimura, Kei Oya, Yoshihide Hashimoto, Yuki Suzuki, Yuichiro Nawa, Seiichi Funamoto, Akio Kishida, Takeo Nakano. Sputter-deposition of distinguishable marker on decellularized tissue for non-invasive imaging techniques. The 2nd International Symposium on Biomedical Engineering 2017.11.09 Tokyo


15. Akio Kishida. Control of biological response of polymers by surface modification. APA2017 2017.11.23 India

Organic and Medicinal Chemistry

Professor Hiroyuki KAGECHIKA
Assistant Professor Syuichi MORI
Assistant Professor Mari YUASA
Eng Official Emiko KAWACHI
Secretary Mayumi SHIKAMA

Graduate Student
Dilihumaer AINIWAER
Yusuke Okazaki
Nozomi Tsuemoto
Sayuri Goryoda
Hidekazu Yokoo
Hiroto Inuma
Kazuhiro Imaida
Ryohei Iwashita
Tsuyoshi Oikawa
Yuki Noji
Mititake Oikawa
Takahiro Miura
Daiki Kato
Chihiro Komatsu
Rie Tsukamoto

(1) Outline

1) Medicinal Chemistry of Retinoids
Retinoids regulates various significant biological phenomena, such as cell differentiation, proliferation, morphogenesis, metabolism and homeostasis. We have developed novel synthetic retinoid, Am80 (tamibarotene) as drug for acute promyelocytic leukemia. Novel synthetic retinoids have been developed foe clinical use in the field of autoimmune diseases, neurodegenerative diseases, metabolic syndromes.

2) Medicinal Chemistry of Nuclear Receptors
Small hydrophobic molecules such as steroid hormones and activated vitamins A/D control various biological phenomena, including growth, development, metabolism, and homeostasis, by binding to and activating specific nuclear receptors. Nuclear receptors have become one of the most significant molecular targets for drug discovery in the fields of cancer, metabolic syndrome, autoimmune diseases, and so on. In this project, novel ligands of various nuclear receptors have been developed.

3) Development of Novel Functional Fluorescent Molecules for Elucidation of Intracellular Signal Transduction Pathways
Functional fluorescent molecules useful in many fields of scientific research, including analytical chemistry or cell biology have been developed.

4) Aromatic Architecture Based on the Steric Properties of N-Methylated Amides
The amide bond structure of amide derivatives often plays a key role in functions such as molecular recognition events or biological activities. In contrast to the extended trans structures of most secondary amides, the corresponding N-methylated compounds exist in cis form in the crystals and predominantly in cis form in various solvents. The cis conformational preference is useful as a building block to construct aromatic molecules with
unique crystal or solution structures.

(2) Lectures & Courses

Organic and Medicinal Chemistry covers several aspects of organic chemistry, medicinal chemistry and chemical biology. Through this course, students are expected to understand the fundamental knowledge, recent topics, and experimental techniques related to these fields.

(3) Publications

[Original Articles]


2. Tsuji, M.; Shudo, K.; Kagechika, H.. The receptor subtype selectivity of retinoid X and retinoic acid receptors via quantum mechanics FEBS Open Bio. 2017.03; 7; 391-396

3. Suzuki Yukina, Akima Ryunosuke, Murayama Takashi, Kurebayashi Nagomi, Ishigami-Yuasa Mari, Mori Syuichi, Kagechika Hiroaki, Suzuki Junji, Kanemaru Kazunori, Iino Masamitsu, Oyamada Hideto, Oguchi Katsu, Oguchi Haruo, Toyoshima Chikashu, Sakurai Takashi. A novel screening method for drugs inhibiting type 1 ryanodine receptor (RyR1) by ER Ca2+ monitoring JOURNAL OF PHARMACOLOGICAL SCIENCES. 2017.03; 133(3); S195


5. Hoang, H. N.; Nagashima, Y.; Mori, S.; Kagechika, H.; Matsuda, T.. CO2-expanded bio-based liquids as novel solvents for enantioselective biocatalysis Tetrahedron . 2017.05; 73(20); 2984-2989


7. Hai Nam Hoang, Nagashima Yoshihiro, Mori Shuichi, Kagechika Hiroaki, Matsuda Tomoko. CO2-expanded bio-based liquids as novel solvents for enantioselective biocatalysis TETRAHEDRON. 2017.05; 73(20); 2984-2989


15. Hoang Hai N., Granero-Fernandez Emanuel, Yamada Shinjiro, Mori Shuichi, Kagechika Hiroyuki, Medina-Gonzalez Yacchiufiatl, Matsuda Tomoko. Modulating Biocatalytic Activity toward Sterically Bulky Substrates in CO2-Expanded Biobased Liquids by Tuning the Physicochemical Properties ACS SUSTAINABLE CHEMISTRY & ENGINEERING. 2017.11; 5(11); 11051-11059


[Books etc]

[Misc]
1. Tomoya Hirano, Shuichi Mori, Hiroyuki Kagechika. Development of therapeutic strategies based on chemical biological studies of histone methyltransferase 2017.11; 27(4); 208-212

[Conference Activities & Talks]
2. Ishigami-Yuasa, M., Ekimoto, H., Kagechika, H.. Synergistic inhibition of several human cancer cell proliferations by a synthetic retinoid tamibarotene (Am80) in combination with the epigenetic modulators. FASEB meeting on retinoid Florida, USA
3. Tsuemoto, N., Mori, S., Kawachi, E., Kagechika, H.. Design and synthesis of novel RAR ligands containing pentafluorosulfanyl group. FASEB meeting on retinoid Florida, USA

[Patents]
2. IKK3 kinase, Patent Number : United States Patent 6576439

[Works]
1. Expression Vectors http://dna.brc.riken.jp/search/dep3357.html, Other, RIKEN
Chemical Bioscience

Professor Takamitsu HOSOYA
Associate Professor Suguru YOSHIDA
Assistant Professor Yoshitake NISHIYAMA
Research Assistant Takamoto MORITA
Technical Assistant Yoshihiro MISAWA, Yuki HAZAMA, Tomoko KURIBARA
Graduate Students Kazuya KANEMOTO, Keisuke UCHIDA, Tomohiro MEGURO, Yu NAKAMURA, Harumi ITO, Kotaro MUTSUURA, Youngchan KIM, Yuya TAMURA, Shonan CHIN, Saki FUJII, Tsubasa MATSUZAWA, Keisuke ADACHI, Saki OZAWA, Shuhei KAMADA, Keita SHIMIZU, Norikazu TERASHIMA, Naoya TOKUNAGA, Yoshihiro MIYATA

(1) Outline

Development of new organic synthetic methods, new chemical methodologies, and new chemical tools, those are useful for biological and drug discovery researches.

(2) Research

1) Development of novel generation methods for benzyne species and their synthetic applications.
2) Development of new bioconjugation methods using strained alkynes.
3) Target identification of drugs or drug candidates by photoaffinity labeling based on diazido probe method.
4) Development of new molecular ligation methods based on new azido chemistry.
5) Design and synthesis of efficient substrates for bioluminescence reactions and fluorescent probes for bioimaging and diagnosis of diseases.
6) Design and synthesis of new PET (positron emission tomography) probe candidates for in vivo imaging to promote drug discovery.

(3) Publications

[Original Articles]

1. Morita T, Nishiyama Y, Yoshida S, Hosoya T. Facile Synthesis of Multisubstituted Benzo[ b] furans via 2,3-Disubstituted 6,7-Furanobenzynes Generated from ortho-Iodoaryl Triflate-type Precursors. Chem Lett. 2017.01; 46(1); 118-121


4. Ochiai H, Uetake Y, Niwa T, Hosoya T. Rhodium-Catalyzed Decarbonylative Borylation of Aromatic Thioesters for Facile Diversification of Aromatic Carboxylic Acids. Angew Chem Int Ed. 2017.02; 56(9); 2482-2486


7. Yoshida S, Nagai A, Uchida K, Hosoya T. Enhancing the Synthetic Utility of 3-Haloaryne Intermediates by their Efficient Generation from Readily Synthesizable ortho-Iodoaryl Triflate-type Precursors. Chem Lett. 2017.05; 46(5); 733-736

8. Niwa T, Ochia H, Hosoya T. Copper-Catalyzed ipso-Borylation of Fluoroarenes. ACS Catal. 2017.05; 7(7); 4535-4541


10. Sumida Y, Sumida T, Hosoya T. Nickel-Catalyzed Reductive Cross-Coupling of Aryl Triflates and Non-aflates with Alkyl Iodides. Synthesis. 2017.06; 49(16); 3590-3601


15. Niwa T, Ochiai H, Hosoya T. Facile Transformation of α, β-Unsaturated Carboxylic Acids to Alkenyl-boronic Esters via Rhodium-Catalyzed Decarbonylative Borylation of α, β-Unsaturated Thioesters. Chem Lett. 2017.09; 46(9); 1315-1318


[Conference Activities & Talks]


[Patents]

1. Coelenterazine analogues and coelenteramide analogues , Patent Number : GB2479441

2. Coelenterazine analogues and coelenteramide analogues , Patent Number : GB2540896

3. Coelenterazine analogues and coelenteramide analogues , Patent Number : GB2540897


5. COMPOUND AND PHARMACEUTICAL COMPOSITION FOR NEUROPSYCHOLOGICAL DISORDER OR MALIGNANT TUMOR, Patent Number : ZL201380040385.8

6. COMPOUND AND PHARMACEUTICAL COMPOSITION FOR NEUROPSYCHOLOGICAL DISORDER OR MALIGNANT TUMOR, Patent Number : 9745323
(1) **Outline**

Kawashima Lab. mainly working on the development of medical devices and systems based on control engineering, robotics and fluid dynamics.

Key word is system integration such as hardware and software, electrical and pneumatics, human and machine.

(2) **Research**

1) Surgical robot system
2) Power assist devices using pneumatic actuators
3) Forceps manipulator for minimally invasive surgery
4) Development of soft robots
5) Haptic device using biological and visual information

(3) **Education**

Learn about mechanical design and control engineering for medical devices based on biomechanics. Master a basic skill to develop the devices from the researchers and engineers working on the medical devices and systems. Learn the basic control method of a surgical robot using a personal computer.

(4) **Lectures & Courses**

The object is to provide the ability to design and develop medical devices based on biomechanics, which studies the structure and function of biological systems, with mechanical dynamics, robotics and control engineering.
(5) **Publications**

**[Original Articles]**


2. Toshihiro Kawase, Natsue Yoshimura, Hiroyuki Kambara, Yasuharu Koike. Controlling an electromyography-based power-assist device for the wrist using electroencephalography cortical currents Advanced Robotics. 2017.01; 31(1-2); 88-96

3. Toshihiro Kawase, Takeshi Sakurada, Yasuharu Koike, Kenji Kansaku. A hybrid BMI-based exoskeleton for paresis: EMG control for assisting arm movements Journal of Neural Engineering. 2017.02; 14(1); 016015

4. Tetsuro MIYAZAKI, Takuya IIJIMA, Yuuichi HIRAHARA and Kazushi SANADA. Development and performance evaluation of supporting arm worn by factory worker for reducing body load Transactions of the JSME (in Japanese). 2017.05; 83(849); 16-00544


9. Akinari Onishi, Kouji Takano, Toshihiro Kawase, Hiroki Ora, Kenji Kansaku. Affective stimuli for an auditory P300 brain-computer interface Frontiers in Neuroscience. 2017.09; 11(522);

10. Natsue Yoshimura, Hayato Tsuda, Toshihiro Kawase, Hiroyuki Kambara, Yasuharu Koike. Decoding finger movement in humans using synergy of EEG cortical current signals Scientific Reports. 2017.09; 7; 11382


12. Tetsuro MIYAZAKI, Kazushi SANADA. Experimental Validation of an Optimum Design Method for a Ball Throwing Robot Considering Degrees of Freedom, Link Parameters, and Motion Pattern Mechanical Engineering Journal. 2017.10; 4(5); 17-00147


Biofunctional Restoration

[Books etc]


[Misc]


[Conference Activities & Talks]

1. Tetsuro MIYAZAKI, Kazushi SANADA. Joint Gear Ratio and Motion Design of Ball Throwing Robot Maximizing Ball Throwing Performance. The Robotics and Mechatronics Conference 2017 (ROBOMECH 2017) 2017.05.10
10. Toshihiro TAGAMI, Tetsuro MIYAZAKI, Takahiro KANNO, Shinichiro YAMAMOTO, Kenji KAWASHIMA. Development of master-slave type gait teaching system. SICE 2017 Industrial Application Division Conference 2017.11.20
11. Tadatoshi SATO, Takahiro KANNO, Tetsuro MIYAZAKI, Toshinori Fujita, Kenji KAWASHIMA. Development of forceps holder with remote center of motion using flexible actuator. SICE 2017 Industrial Application Division Conference 2017.11.20

[Awards & Honors]

1. JSME Award 2016 (Paper), JSME, 2017.04
Molecular Cell Biology

Professor Hiroshi Shibuya
Associate Professor Toshiyasu Goto
Assistant Professor Atsushi Sato

(1) Education

Various signaling molecules inducing the cell-growth and differentiation regulate morphogenesis and organogenesis of the vertebrate. The failure of these signal molecules has also been caused with induction of the diseases. Therefore, the elucidation of signal transduction network regulating generation and differentiation is important upon clarifying the mechanism of morphogenesis, organogenesis and diseases. Our research aim is to clarify the signal transduction network regulating the mechanisms of morphogenesis and organogenesis in developmental process. We serve these research and following education to provide graduate students who will become senior scientists in life sciences.

(2) Publications

[Original Articles]

Outline

Our goal is to define the molecular basis for the mechanism of organ formation and regeneration using knockout mice and mutant fishes. To accomplish this goal, we have focused on defining signaling molecules and pathways that regulate liver formation and stress responses. Moreover, we are trying to establish a cell therapy for intractable diseases such as liver failures using self-bone marrow cells. Our study will provide new insights into understanding the precise molecular mechanisms that underlie organ failures found in human disease and will lead to the development of new rational therapy for the diseases.

Research

1. Studies on vertebrate early embryogenesis and developmental toxicity
2. Studies on vertebrate organogenesis
3. Studies on organ homeostasis
4. Studies on behavioral rhythm and locomotor activity

Publications

[Original Articles]

1. Yoichi Asaoka, Hiroshi Nishina, Makoto Furutani-Seiki. YAP is essential for 3D organogenesis withstanding gravity. Dev. Growth Differ.. 2017.01; 59(1); 52-58

2. Seiichiro Mori, Takamasa Takeuchi, Yoshiyuki Ishii, Takashi Yugawa, Tohru Kiyono, Hiroshi Nishina, Iwao Kukimoto. Human Papillomavirus 16 E6 Upregulates APOBEC3B via the TEAD Transcription Factor. J. Virol.. 2017.03; 91(6);


Immunology

Professor: Takeshi TSUBATA, M.D., Ph.D.
Associate Professor: Takahiro ADACHI, Ph.D.
Assistant Professors: Naoko Matsubara, Ph.D.
Assistant Professors: Chizuru AKATSU, Ph.D.
Lecturer: Ji-Yang WANG, Ph.D.
Researcher: Mohammad Aslam, Ph.D.
Researcher: Medzhidov Nazim, Ph.D.
Technicians: Shigeko NAKANO, Yukie KURUSU
Technicians: Takato YODOZAWA, Shukun HOTTA
Secretary: Chikako SAWADA

Graduate Students: Yang-Yang Feng
Graduate Students: Amin ALBORZIAN DESHEIKH
Graduate Students: Sundararaman RENGARAJAN
Graduate Students: Tatsuya YONEMIZU, Ayaka ENDO
Graduate Students: Kyoko NISHIDA
Graduate Students: Yang Hongrui, Li Xuexin
Graduate Students: Moe ENDO, Huang Yuming
Graduate International Research Student: Long Wang

(1) Research

The nature of immune responses depends on whether they respond to protein or non-protein antigens because T lymphocytes recognize only protein antigens. Normal immune system removes pathogens and cancer cells but does not respond to non-microbial foreign substances or self-antigens. Immune responses to non-microbial foreign substances and self-antigens cause allergy and autoimmune diseases, respectively. How the immune system distinguishes pathogens from non-microbial antigens and self-antigens is already clarified for protein antigens. However, little is know about such distinction for non-protein antigens. Immune responses to non-protein antigens play crucial roles in host defense against pathogens such as tuberculosis bacilli and meningococci, and autoimmune diseases such as lupus and immuno-neurological disorders. Thus, immune responses to non-protein antigens constitute a remaining frontier in immunology research. Followings are our research subjects.

1. Recognition of endogenous non-protein antigens by inhibitory B cell co-receptors such as CD22, CD72 and Siglec-10 and its role in the regulation of immune responses and prevention of autoimmune diseases.
2. Mechanisms for B cell response to polysaccharide antigens, and the role of endosomal signaling in these mechanisms
3. Development of drugs that mimic glycan signals to regulate regulatory B cells.
(2) **Education**

Lecture course on immunology at the master course aims at giving the students the basic ideas how immune system recognize and respond to the antigens, and how immune system efficiently remove pathogens without responding to self-antigens and environmental antigens. In the lecture course in biomedical Science at the doctor course, lectures on immune responses are given so that the students are introduced with the current topics in the field of humoral immune responses. Research projects in both master and doctor courses aims at training the students to acquire basic research techniques on immunology, molecular biology and biochemistry, and abilities to conduct cutting-edge research in the field of immunology by themselves under supervision.

(3) **Publications**

**[Original Articles]**

1. Shigeru Hishinuma, Kiyoe Kosaka, Chizuru Akatsu, Yoshihiro Uesawa, Hiroyuki Fukui, and Masaru Shoji. Asp73-dependent and –independent regulation of the affinity of ligands for human histamine H1 receptors by Na+ Biochemical Pharmacology. 2017.03; 128; 46-54

2. Tsubata, T. B cell tolerance and autoimmunity F1000Research. 2017.03; 6; 391


**[Conference Activities & Talks]**

1. Mohammad Aslam, Martin Weigert and Takeshi Tsubata. Regulation of self-reactive B cells by CD72 and Fas . 11th International Symposium of The Institute Network‘Frontiers in Biomedical Sciences’ 2017.01.26 Tokushima

2. Taro Watabe, Takashi Nagaishi, Akinori Hosoya, Nisha Jose, Arisa Tokai, Yudai Kojima, Takahiro Adachi, Mamoru Watanabe. The lack of secreted IgA spontaneously induces the mucosal inflammation specifically in the ileum. DDW (AGA) 2017.05.09 Chicago

3. Takashi Nagaishi, Taro Watabe, Nisha Jose, Akinori Hosoya, Yudai Kojima, Naoya Tsugawa, Takahiro Adachi, Mamoru Watanabe. IgA Deficiency Induces Spontaneous Inflammation in the Ileum. FOCIS 2017 2017.06.14 Chicago

4. Feng Yangyang, Rengarajan Sundararaman, Tang Miao, Tsubata Takeshi. Role of prolonged ROS in B cell receptor signaling. The Regular Meeting of the Japanese Biochemical Society, Kanto Branch 2017 2017.06.17 Tokyo

5. Amin Alborzian-Deh-Sheikh, Chizuru Akatsu, Hideharu Ishida2, and Takeshi Tsubata. Cis-ligand dependent and independent interaction of receptor type protein tyrosine phosphatase CD45 with B cell inhibitory receptor CD22. The Regular Meeting of the Japanese Biochemical Society, Kanto Branch 2017 2017.06.17 Tokyo

6. MEDZHIDOV Nazim, TAKATA Toshitaro, SUZUKI Mitsuhiko, ICHINOSE Shizuko, TSUBATA Takeshi. Distinct ubiquitination level and sorting of the B cell receptor. The Regular Meeting of the Japanese Biochemical Society, Kanto Branch 2017 2017.06.17 Tokyo

7. Akinori Hosoya, Takashi Nagaishi, Taro Watabe, Naoya Tsugawa, Nisha Jose, Yudai Kojima, Takahiro Adachi, Mamoru Watanabe. Verification of immunoglobulin A protection of intestinal mucosa from microflora. The 5th Annual Meeting of AOCC 2017 2017.06.17 Seoul

8. Takashi Nagaishi, Taro Watabe, Nisha Jose, Akinori Hosoya, Yudai Kojima, Naoya Tsugawa, Takahiro Adachi, Mamoru Watanabe,. Deficiency of IgA Induces Microflora Alteration and Ileal Inflammation.. ICMI 2017 2017.07.21 Washington DC

10. Takeshi Tsubata. Inhibitory B cell co-receptor CD72 regulates self-tolerance through SHP-1 activation. University of Freiburg 2017.10.11 Freiburg, Germany.


12. Takeshi Tsubata. Inhibitory B cell co-receptor and autoimmunity. Seoul National University School of Dentistry 2017.11.08 Seoul.


[Awards & Honors]

1. Eugen-und-Ilse-Seibold-Preis, Eugen and Ilse Seibold Prize, Deutsche Forschungsgemeinschaft, 2017.10.
Epigenetics

(1) Outline

Epigenetics and Genetics are basics of biology that enables us to elucidate several ‘genomic functions’ in inheritance, development and evolution of the organisms including our human beings. Genomic imprinting is a mammalian-specific epigenetic mechanism that gives rise to functional differences between paternally- and maternally-derived genomes in development, behavior and growth. Somatic cloned animals give us unique chances to examine ‘genetically identical but epigenetically diverged animals’. Mammalian-specific LTR retrotransposon-derived genes are essential for mammalian development, such as placenta and brain functions. These studies show us how Epigenetics and Genetics are important in mammalian biology. We focus on these mammalian-specific genomic functions to elucidate how these genomic functions work and have been evolved as new genomic functions during evolution. Our final goal is to contribute to the human biology as well as medicine in the 21st century by novel understanding of genomic functions.

(2) Research

1) Genomic imprinting in human and mammalian development.
2) Placenta function and its evolution in mammals.
3) Somatic cloning: its epigenetic effects and application to regenerative medicine.
4) Assisted reproductive technology: its epigenetic effects and safer application.
5) Role of retrotransposon-derived genes in mammalian specific genomic functions.

(3) Education

Graduate School of Medical and Dental Science
Life Science and Technology Track
    Bioscience I
Medical and Dental Science and Technology Track
    Molecular and Cellular Biology
    Developmental and Regenerative Bioscience
    Molecular Cell Biology
    Introduction to Human Molecular Genetics

Faculty of Medicine
    Molecular Genetics
(4) Lectures & Courses
Obtain basic and applicative knowledges and techniques by challenging cutting-edge themes.

(5) Clinical Services & Other Works
Research Center for Science Systems, Senior Researcher
Japan Society for Biological Sciences, Board member
Japan Society for Epigenetics, Secretary

(6) Publications
[Original Articles]

2. Moe Kitazawa, Masaru Tamura, Tomoko Kaneko-Ishino, Fumitoshi Ishino. Severe damage to the placental fetal capillary network causes mid- to late fetal lethality and reduction in placental size in Peg11/Rtl1 KO mice. Genes Cells. 2017.02; 22(2); 174-188
Medical Science Mathematics

Professor: Tatsuhiko Tsunoda, Junior Associate Professor: Daichi Shigemizu, Assistant Professor: Fuyuki Miya

(1) Outline

Medical application of rapidly progressing omic profiling technologies and, in particular, the promotion of personalized/precision/preventive medicine have been keenly desired. Our department overcomes such medical science issues by using a combination of mathematics and computational sciences: (1) Integrative analysis of clinical and omic data for exploring etiologies of intractable diseases, (2) Molecular classification of and systems approach to understanding disease based on omic profiling, and (3) Prediction for personalized/precision/preventive medicine. We apply mathematical methods, e.g., machine learning techniques, to optimum therapy prediction for each patient when she/he visits to a hospital/medical institute, and we can also apply these methods to disease prevention based on an individual’s health check records.

(2) Publications

[Original Articles]


29. Jae-Jung Kim, Sin Weon Yun, Jeong Jin Yu, Kyung Lim Yoon, Kyung-Yil Lee, Hong-Ryang Kil, Gi Beom Kim, Myung-Ki Han, Min Seob Song, Hyoung Doo Lee, Kee Soo Ha, Sejung Sohn, Todd A Johnson, Atsushi Takahashi, Michiaki Kubo, Tatsuhiko Tsunoda, Kaoru Ito, Yoshihiro Onouchi, Young Mi Hong, Gi Young Jang, Jong-Keuk Lee, . A genome-wide association analysis identifies NMNAT2 and HCP5 as susceptibility loci for Kawasaki disease. J. Hum. Genet.. 2017.12; 62(12); 1023-1029

30. Shiu Kumar, Alok Sharma, Tatsuhiko Tsunoda. An improved discriminative filter bank selection approach for motor imagery EEG signal classification using mutual information. BMC Bioinformatics. 2017.12; 18(Suppl 16); 545


32. Alok Sharma, Piotr J Kamola, Tatsuhiko Tsunoda. 2D-EM clustering approach for high-dimensional data through folding feature vectors. BMC Bioinformatics. 2017.12; 18(Suppl 16); 547


[Conference Activities & Talks]
1. Tatsuhiko Tsunoda. Multimomics and clinical analysis of cancer. CREST International Symposium on Big Data Application 2017.01.12 Tokyo, Japan
2. Tatsuhiko Tsunoda. Future medicine based on genomic big data and artificial intelligence. Citizen public lecture 2017.02.17
3. Tatsuhiko Tsunoda. New development of genomic medicine based on omic analysis. The 8th Symposium on Biological Statistics Network 2017.03.27
5. Tatsuhiko Tsunoda. Omic analysis drives precision medicine. International Conference for Precision Cancer Medicine 2017.06.30 Tokyo, Japan
6. Tatsuhiko Tsunoda. Multi-omic Analysis based on Medical Big Data. Workshop for collaboration between TMDU and Waseda University 2017.07.12 Tokyo, Japan
7. Tatsuhiko Tsunoda. Exploring etiologies, sub-classification, and risk prediction of diseases based on big-data analysis of clinical and whole omics data in medicine. CREST Big Data Fields Joint Meeting 2017.09.16 Tokyo, Japan
8. Tatsuhiko Tsunoda. Multi-omic analysis for precision cancer medicine. DNA sequencing technologies and their application in practice 2017.10.12 Yerevan, Armenia
9. Tatsuhiko Tsunoda. Trans-omic analysis drives precision medicine. The 1st International Symposium for Trans-Omics 2017.11.21 Tokyo

[Patents]
1. METHOD FOR SELECTING IPS CELL CLONE, AND METHOD FOR SELECTING GENE USED IN METHOD FOR SELECTING SAME, Announcement Number : WO 2012/115270
[Works]
2. 2D-EM: Matlab package of 2D-EM clustering approach, Software, 2017.08
3. DRAGON: Matlab package of DRAGON clustering approach, Software, 2017.09

[Others]
1. Discovery of new gene regions related to asthma, 2017.12
   Appeared in newspaper Kagaku-Kougyou-Nippou


Structural Biology

Professor Nobutoshi ITO
Associate Professor Teikichi IKURA
Assistant Professor Nobutaka NUMOTO

(1) Outline

The advance of genome science and proteomic analysis has produced a large amount of information about the primary structure of proteins and their spatial and temporal distributions. On the other hand, most of the proteins only function when they take certain three dimensional structures. As obviously seen in so-called prion diseases, proteins which are chemically correct but structurally incorrect not only fail to function properly but also can harm cells. Our laboratory aims to understand the function of biological macromolecules at atomic level through structure analysis and other methods of physical chemistry, in the hope that accumulation of such knowledge will eventually lead to development of drugs. We are also involved in providing database of such structural data to scientists through the activities of Protein Data Bank Japan.

(2) Research

Collaborating with groups within and outside of the university, we are engaged in various research projects including:

1) Structural analyses of B-cell coreceptors
2) Physicochemical analysis on the mechanism of the signal transduction for activation of T cells
3) Structural analyses of potential drug targets of nuclear receptors
4) Analysis of interactions between tau protein and Pin1
5) Molecular mechanism of the sero-specificity of dengue virus
6) Structural basis of giant hemoglobins
7) Molecular basis of suppression of HIV-1
8) Structure based drug design for protein kinases
9) Improvement in Protein Data Bank

(3) Lectures & Courses

The students learn theoretical basis of structure determination, mainly X-ray crystallography, of proteins and other biological macromolecules. Recent advance in structural biology is also discussed in seminar. Students learn lab techniques related to large-scale production, purification and crystallization of protein samples. They also learn computational methods to determine and refine crystal structures.
(4) Publications

[Original Articles]


2. Yurina Miyashita, Eiji Ohmae, Teikichi Ikura, Kaoru Nakasone, Katsuo Katayanagi. Halophilic mechanism of the enzymatic function of a moderately halophilic dihydrofolate reductase from Haloarcula japonica strain TR-1. Extremophiles. 2017.05; 21(3); 591-602

[Conference Activities & Talks]

1. Nobutoshi Ito. Protein Data Bank and Structure Deposition at PDBj. CCP4 Crystallography School and Workshop 2017.01.27 SPring8, Harima, Japan

2. Teikichi Ikura, Nobutoshi Ito. Catalytic Mechanism of a Protease Derived from Pin1. The 17th Annual Meeting of the Protein Science Society of Japan 2017.06.21 Sendai

3. Nobutaka Numoto, Chizuru Akatsu, Kenro Shinagawa, Takeshi Tsubata, Nobutoshi Ito. Prediction of ligand-binding site of B cell inhibitory receptor CD72 through crystal structure. The 17th Annual Meeting of the Protein Science Society of Japan 2017.06.22 Sendai


5. Takeshi Kawabata, Masayuki Oda, Satomi Inaba, Nobutaka Numoto, Fusako Kawai. Structural and mutational analysis of PET-hydolyzing enzyme, Cuti190, based on the 3D docking structure with model compounds of PET. 254th American Chemical Society National Meeting & Exposition 2017.08.20 Washington, DC, USA


7. Teikichi Ikura, Nobutoshi Ito. Quantitative evaluation of activity of a protease derived from Pin1 for tau protein. The 56th Annual Meeting of the Biophysical Society of Japan 2017.09.21 Kumamoto, Japan

Neuroscience

Professor Kohichi Tanaka
Associate Professor Tomomi Aida
Assistant Professor Saeko Ishida
Assistant Professor Yuichi Hiraoka

Graduate Student (doctor course)
Zhao Zhuoyang
Kaori Sugiyama
Takehisa Handa

Graduate Student (master course)
Haruka Takigawa
Hiroshi Ogawa
Kurumi Hagiwara
Bi Haining

Technical Staff
Harumi Ishikubo

Secretary
Satomi Ohno

(1) Outline

The final goal of our research is to understand molecular, cellular, and neuronal ensemble mechanisms underlying higher order brain functions including learning and memory. For that purpose, we combine molecular genetics, physiological and behavioral methods. The laboratory also studies the mechanism that underlies neuronal cell death and regeneration.

(2) Research

1. Functions of glutamate transporters in the brain

Glutamate is a major excitatory neurotransmitter and plays an important role in neuronal plasticity and neurotoxicity in the central nervous system. Glutamate transport proteins provide the mechanism by which synaptically released glutamate is inactivated and kept below toxic levels in the extracellular space. By now, five subtypes of high-affinity glutamate transporters have been identified in the mammalian brain. Our lab studies the physiological and pathological roles of glutamate transporter subtypes using subtype-specific knockout mice. Despite glial glutamate transporter dysfunction leading to excitotoxicity has been documented in many neurological diseases, it remains unclear whether its dysfunction is a primary cause or secondary outcome of neuronal death at disease state. Here we show the combined loss of glial glutamate transporters GLT1 and GLAST in spinal cord caused motor neuronal death and hindlimb paralysis. Further, our novel mutant exhibits the nuclear irregularities and calpain-mediated progressive nuclear pore complex degradation. Our study reveals that glial glutamate transporter dysfunction is sufficient to cause motor neuronal death in vivo (Sugiyama et al., 2017).
We show that GLAST, a major glutamate transporter in the cerebellar cortex, is essential for synaptic wrapping by Bergmann glia and synaptic wiring on Purkinje cells (PCs) by parallel fibers (PFs) and climbing fibers (CFs). Without GLAST, monoinnervation of PCs by single strong CFs and segregation of CF and PF territories along PC dendrites cannot develop normally or be maintained. PCs are frequently innervated by additional CF, whereas innervation by main CFs becomes weaker. Ectopic PF synapses appear at proximal dendrites, causing disruption of CF and PF territory segregation along PC dendrites. We conclude that GLAST is indispensable for the establishment of excitatory synaptic wiring to PCs through competition between CFs and between CFs and PFs (Miyazaki et al., 2017).

2. Role of DEPDC5 in the pathogenesis of epilepsy and psychiatric disorder
Epilepsy is one of the most frequent (1%) neurological disorders characterized by spontaneous and recurrent seizures. However, pharmacoresistance occurs in 30% of the patients. Recently, a role for genetic factors in idiopathic epilepsies, with no identified structural lesion or metabolic cause, is becoming clear. DEP (Dishevelled, Egl-10 and Pleckstrin) domain containing protein 5 (DEPDC5) is a newly identified causative gene for epilepsy (Ishida et al., 2013). DEPDC5 has no transmembrane domain and no homology with known epilepsy genes encode ion channel or transmitter receptor subunits. Its role in epileptogenesis likely differs from the mechanisms known so far. In addition, some individuals also have psychiatric disorder, like autistic features and schizophrenia. This suggests that DEPDC5 is a common genetic actor in refractory epilepsy and psychosis. We revealed that Depdc5 inhibits mTORC1 signaling, and Depdc5 KO rats are embryonic lethal (Marsan and Ishida et al., 2016). To avoid the lethality and deeply understand the function of DEPDC5, we conditionally delete Depdc5 in specific brain region or neuronal cells in mice by Cre-loxP system. This year, we have generated Depdc5 floxed mice using CRISPR-Cas9 system. We strongly promote our research with this mouse. Research of DEPDC5 is likely to give new insight into epilepsy and psychosis research.

(3) Education

Goals/Outline:
Students should generate genetically modified animals to comprehensively understand the cognitive mechanisms at the level of molecule to behavior. Then, students should analyze cognitive deficits of mutant animals and those molecular mechanisms.

Available programs:
Participation in the ongoing research project; as needed
Training for cell biology: five times a year 13:00 – 16:00

Experiment:
2. Generation of genetically modified mice
3. Behavioral analysis of the mice
4. Morphological analysis of central nervous systems.

(4) Lectures & Courses

The aim of this practice is to learn molecular biological, anatomical, electrophysiological and psychological approaches to elucidate the mechanism of cognition. Moreover, based on previous case reports of cognitive deficits, students should plan and discuss what kinds of the researches are possible and meaningful to elucidate the pathology of these diseases, leading to unveil the mechanism of cognition.

(5) Publications

[Original Articles]
2. Ken-Ichiro Kubo, Kimiko Deguchi, Taku Nagai, Yukiko Ito, Keitaro Yoshida, Toshihiro Endo, Sei-ko Benner, Wei Shan, Ayako Kitazawa, Michihiko Aramaki, Kazuhiro Ishii, Minkyung Shin, Yuki Mat-sunaga, Kanehiro Hayashi, Masaki Kakeyama, Chiharu Tohyama, Kenji F Tanaka, Kohichi Tanaka, Sachio Takashima, Masahiro Nakayama, Masayuki Itoh, Yukio Hirata, Barbara Antalffy, Dawna D Armstrong, Kiyofumi Yamada, Ken Inoue, Kazunori Nakajima. Association of impaired neuronal migration with cognitive deficits in extremely preterm infants. JCI Insight. 2017.05; 2(10);


[Patents]

Bio-informational Pharmacology

(1) Outline

This laboratory focuses on understanding pathogenesis of intractable and common cardiovascular diseases using multidisciplinary approach (patch-clamp, cell biology, optical recording, genetic analysis, and computational analysis). Our ultimate goal is to improve diagnosis and management of intractable and common cardiovascular diseases.

(2) Research

1. Gender-specific medicine (GSM) for cardiovascular diseases

In the past few years, we have shown that non-genomic regulation of cardiac ion channels by sex hormones underlies, at least in part, gender difference in cardiac electrophysiology, and thus susceptibility to arrhythmias. This year, we used FRET imaging and LC/MS technology to show that non-genomic regulation of cardiac ion channels by sex hormones cross-talks with adrenergic receptor signaling specifically in the raft micro-domain.

2. Pathogenesis of atrial fibrillation (AF)

Atrial fibrillation (AF) is the most frequent arrhythmias, reaching more than 1 million patients in Japan. Associated cerebral infarction due to cardiogenic thrombosis (250,000 patients/year in Japan) and higher incidence of cognitive impairment cause reduced QOL and are main causes of bedridden old people. Thus, establishment of therapeutic strategy for AF is an urgent requirement.

(1) GWAS for AF
We had carried out most extensive GWAS (genome-wide association study) in Japan to determine gene polymorphisms associated with AF. Since 2011, we have participated in the international Meta-analysis called as CHARGE study. CHARGE study found 10 SNPs associated with AF; among them, 6 SNPs were associated with both European/American and Japanese, and 4 with European/American but not with Japanese.

(2) Functional analysis of AF associated genes
One of the sales-points of GWAS is the identification of novel pathogenic pathways and therapeutic targets due to its comprehensibility. We carried out functional analysis for 6 genes associated with Japanese AF patients, and found a novel pathway generating abnormal automaticity in the pulmonary vein myocardium, which is the main triggering factor of atrial fibrillation.

(3) Risk stratification
Another sales-point of GWAS is the risk stratification of the diseases and its use for future personalized medicine. Based on GWAS data, we calculated AF risk score and classified them into 4 quartile groups. The highest risk group has 5.5 higher risk of AF development relative to the lowest risk group (left panel in Figure 1). The risk stratification yielded around 60% sensitivity and specificity (right panel in Figure 1), which are not enough for personalized medicine, and further studies to increase odds ratio are needed.

3. Pathogenesis of ventricular fibrillation (VF) and sudden cardiac death
Despite extensive effort by many researchers for years, VF remains the main cause of sudden death, and the biggest challenge in arrhythmia research. Last year, we showed that genetic deletion of the His-Purkinje system-specific transcription factor in mice exhibited exercise-related ventricular tachyarrhythmias. This year, we searched for genetic disturbance of this transcription factor in patients with idiopathic VF, and found that the mutations of this factor are responsible for idiopathic VF, and a common variant is a modifier of causative gene mutations for idiopathic VF.

4. Use of iPS cells for arrhythmia research
In the past few years, we have aimed to use human iPS-derived cardiomyocytes (hiPS-CMs) for drug screening. hiPS-CMs include various types of cardiomyocytes, such as atrial, ventricular, and nodal types of cardiomyocytes, and exhibit relatively immature electrophysiological properties of cardiac cells, hindering high-quality drug screening. In order to generate mature ventricular-like hiPS-CMs, we over-expressed a gene into hiPS-CMs. The genetically-altered hiPS-CMs exhibited mature forms of action potentials and drug sensitivity. Our novel technique would be useful for evaluation of drug-induced alternation of repolarization processes in the human cardiomyocytes.

5. Use of state-of-art technology for cardiovascular research
(1) Use of motion vector technology for in vitro analysis of cardiac contraction
Motion vector technology created by Sony Co. (Dr. Matsui E. et al.) is the in vitro system to assay non-invasively contraction and relaxation speed of cardiac myocytes. We have tried to broaden its application to screening of cardiac toxicity of drugs. This year, we applied to examine cardiac toxicity of anti-cancer drugs.

(2) Use of 3-D cardiac simulator (UT-heart) for screening of cardiac toxicity of drugs
Prof. Hisada T. et al. in the University of Tokyo have developed 3-D cardiac simulator (UT-heart). We have tried to broaden its application to screening of cardiac toxicity of drugs. This year, we examined 10 standard drugs (high risk, intermediate risk, and no risk).

(3) Education

School of Medicine
   2nd grade Introduction to Neurophysiology (2 units)
   2nd grade Physiology (6 units)
   3rd grade Cardiology (1 unit)
   4th grade Project semester
School of Health Care Medicine
   3rd/4th grade Cardiac physiology (8 units)
(4) Publications

[Original Articles]


2. Ihara Kensuke, Sasano Tetsuo, Sugiyama Koji, Takahashi Kentaro, Furukawa Tetsushi. CRISPR/Cas9ベクターのin vivo Generating Biological Pacemaker by CRISPR/Cas9 Based in Vivo Genome Editing. Scientific Meeting of the Japanese Circulation Society Abstract. 2017.03; 81 th; PE-036

3. Takahashi Kentaro, Sasano Tetsuo, Ihara Kensuke, Isobe Mitsuaki, Furukawa Tetsushi. 「Pannexin-1 Contributes to the Maintenance of Cardiac Function against Acute Pressure-overload as a 'Mechanosensor') Scientific Meeting of the Japanese Circulation Society Abstract. 2017.03; 81th; PE-439


5. Fukuda Shun, Kodama Masami, Nagamori Shushi, Isozumi Noriyoshi, Fujizuka Miki, Kita Satomi, Iwamoto Takahiro, Kanai Yoshikatsu, Furukawa Tetsushi, Kurokawa Junko. Roles of macromolecular complexes in calcium-sensitivity of the cardiac I-Ks channel JOURNAL OF PHARMACOLOGICAL SCIENCES. 2017.03; 133(3); S166

6. Fukuda Shun, Kodama Masami, Nagamori Shushi, Isozumi Noriyoshi, Fujizuka Miki, Kita Satomi, Iwamoto Takahiro, Kanai Yoshikatsu, Furukawa Tetsushi, Kurokawa Junko. Roles of macromolecular complexes in calcium-sensitivity of the cardiac IKs channel. Journal of Pharmacological Sciences. 2017.03; 133(Suppl.3); S166


10. Min Li, Yasunari Kanda, Takashi Asihara, Tetsuo Sasano, Yuji Nakai, Masami Kodama, Erina Hayashi, Yuko Sekino, Tetsushi Furukawa, Junko Kurokawa. Overexpression of KCNJ2 in induced pluripotent stem cell-derived cardiomyocytes for the assessment of QT-prolonging drugs. J. Pharmacol. Sci.. 2017.06; 134(2); 75-85


13. Li Min, Kanda Yasunari, Ashihara Takashi, Sasano Tetsuo, Nakai Yuji, Kodama Masami, Hayashi Erina, Sekino Yuko, Furukawa Tetsushi, Kurokawa Junko. Overexpression of KCNJ2 in induced pluripotent stem cell-derived cardiomyocytes for the assessment of QT-prolonging drugs. Journal of Pharmacological Sciences. 2017.06; 134(2); 75-85


[Books etc]

[Misc]
1. Tetsushi Furukawa. Arrhythmias originating from localized areas of the heart SEITAI NO KAGAKU. 2017.12: 68(6): 564-568

[Conference Activities & Talks]
1. Ihara K, Sasano T, Sugiyama K, Takahashi K, Furukawa T. Generating biological pacemaker by CRISPR/Cas9 based in vivo genome editing. The 81st Annual Scientific Meeting of the Japanese Circulation Society. 2017.03.23

2. Takahashi K, Sasano T, Ihara K, Isobe M, Furukawa T. Pannexin-1 Contributes to the Maintenance of Cardiac Function against Acute Pressure-overload as a ‘Mechanosensor’. The 81st Annual Scientific Meeting of the Japanese Circulation Society. 2017.03.23


4. Jun Takeuchi. 2-defined factors are essential for the production of functional cardiomyocytes with the selective innervation. 2017 Keystone Symposia Conference X7: Molecular Mechanisms of Heart Development 2017.03.28

5. Jun Takeuchi. Direct cardiomyocyte specification and differentiation by the defined factors. 2017 Weinstein Cardiovascular Development and Regeneration Meeting 2017.05.04 Hilton Columbus Downtown, Columbus, Ohio

6. Jun Takeuchi. Cardiac developmental signaling and programming by the defined factors. 2017 Keystone Symposia Conference X7: Molecular Mechanisms of Heart Development 2017.03.28


Epigenetic Epidemiology

Professor: Masaaki MURAMATSU
Associate Professor : Noriko SATO
Assistant Professor : Chihiro Imai
Adjunct Instructor : Tomio Arai

Graduate Student: Fujitani, Tay Zar Kyaw, Tadaaki Katsuta, Shilpa Pavethynath, Maidina Abudushataer, Ake Ko Ko Minn Yuiri Tsubota, Zong Yuan, Naomi Hichiwa, Jin Xin
Research Resident: Arisa Nakata

(1) Outline

Many common chronic diseases are multifactorial in that they are caused by multiple genetic and environmental factors. By applying the technology and information of human genome to epidemiological studies, we aim to clarify the role of genetic polymorphisms, epigenetic changes, as well as their interaction with environmental factors, which may contribute to the development of these diseases.

(2) Research

Our research subjects are as follows.

1. Gene-environment interaction that affects the onset of metabolic syndrome and its related phenotypes.
2. Genetic factors that affect the severity of pathological atherosclerosis.
3. Responder vs non-responder of prodrugs and polymorphisms of drug metabolizing enzymes.
4. Severe cutaneous adverse response (Stevens-Johnson’s Syndrome) and HLA genotypes.
5. The role of epigenetic regulation and fetal programming in common diseases.

(3) Education

Masaaki Muramatsu:Holistic Study of Disease Prevention Ⅰ
Masaaki Muramatsu:Environmental/Social Health
Masaaki Muramatsu:Negotiation and Debate in English
Noriko Sato, Masaaki Muramatsu: Bioscience Ⅰ
Noriko Sato: Molecular and Cellular Biology
Noriko Sato: Introduction to Human Molecular Genetics
(4) Lectures & Courses

We focus on common diseases such as diabetes, hypertension, obesity, metabolic syndrome, and atherosclerosis which are caused by multiple genetic and environmental factors, and aim to decipher these factors as well as their interactions by applying the technology and information of human genome to epidemiology. Our goal is not only to identify disease genes and polymorphisms but also to elucidate gene-environment interactions that contribute to the onset and progression of the diseases. Epigenetic changes in common diseases are also in our scope. A new project has been started to study methods for educating genome-based health literacy by employing information generated from personal genome sequences.

(5) Publications

[Original Articles]


[Misc]


[Conference Activities & Talks]

1. [Molecular Epidemiology : SATO Noriko] Noriko Sato, Hideki Takimoto, Motoko Okamitsu, Tay Zar Kyaw, Chihiro Imai, Nay Chi Htun, Satoshi Yago, Tomoko Aoyama, Seijiru Yamaguchi and Naoyuki Miyasaka. Study design: the evaluation of interindividual differences in neonatal epigenome - the BC-GENIST project. the 21st World Congress of Epidemiology, International Epidemiological Association 2017.08.21 Saitama, Japan

2. [Molecular Epidemiology : SATO Noriko] Hideki Takimoto, Motoko Okamitsu, Noriko Sato, Tay Zar Kyaw, Nay Chi Htun, Chihiro Imai, Yuiri Tsubota, Reiko Tajiri-Shiral, Satoshi Yago, Tomoko Aoyama, Naoyuki Miyasaka. Dietary intakes from 3-day weighed dietary records among pregnant participants in
the Birth Cohort - Gene and ENvironment Interaction Study of TMDU (BC-GENIST). the 21st World Congress of Epidemiology, International Epidemiological Association 2017.08.21 Saitama, Japan
RIKEN Molecular and Chemical Somatology

Visiting Professor  
Soichi Kojima

Visiting Professor  
Mikiko Sodeoka

Visiting Professor  
Nobumoto Watanabe

Visiting Professor  
Yoshiki Yamaguchi

Visiting Professor  
Ichiro Taniuchi

Visiting Professor  
Motomasa Tanaka

Visiting Lecturer  
Nobuhiko Miyasaka

Visiting Lecturer  
Ambara R. Pradipta

Visiting Lecturer  
Takeshi Nakano

Visiting Lecturer  
Kosuke Dodo

Visiting Lecturer  
Ryo Endo

Visiting Lecturer  
Akiko Tane

Visiting Lecturer  
Yutaka Furutani

Visiting Lecturer  
Qin Xian-Yang

Visiting Lecturer  
Tetsuya Koide

Graduate Students  
D3  Sayoko Yamasaki

Kruthi Sharamjeet Suvarna

D2  Mengqian Li

D1  Chih-Hao Shen

(1) Research

Molecular and Chemical Somatology is an interdisciplinary field to understand basis of Bioorganic Chemistry, Chemical Biology, Structural Biology and Molecular Immunology and Molecular Neuroscience as well as their applications to Medicine and Biology by dealing with variety of molecules that regulate cellular functions including low molecular weight organic compounds, proteins, sugars, and hormones. Students will hear and discuss about outlines and/or latest topics on discovery, structure, synthesis, biology, and management of these key molecules/factors, and deepen their understanding of this new study field.
(2) Education

1) Synthetic Organic Chemistry
   • Design and synthesis of bioactive molecules based on synthetic organic chemistry and chemical biology research.

2) Chemical Biology
   • Discovery, target identification and analyses of mechanism of action of bioactive compounds that regulate biological function.

3) Molecular Cellular Pathology
   • Clarification of pathogenesis of diseases at molecular and cellular levels utilizing bioprobes.

4) Structural Biology
   • Analyses of structure and functions of bioactive glycoproteins and related proteins

5) Molecular Immunology
   • Regulatory mechanisms for lymphocyte development

6) Molecular Neuropathology
   • Molecular basis of neuropsychiatric diseases

(3) Publications

[Original Articles]


[Review Articles]

[Books]

[Conference Activities & Talks]
2. Kojima, S. “Genomic and Nongenomic Actions of Acyclic Retinoid on Deletion of MYCN+CD133+ Liver Cancer Stem Cells ” Xiamen University AFPS2017·Asian Federation for Pharmaceutical Sciences 2017, Xiamen, China, November, 2017

5. Taniuchi, I. “Regulation of T cell development in the thymus by transcription factors” Symposium in honor of Ellen Rothenberg: The Molecular Developmental Biology of Lymphocytes. Los Angeles, USA, April, 2017.


Metallic Biomaterials

Takao HANAWA Prof
Yusuke TSUTSUMI Senior Assoc Prof
Maki ASHIDA Assist Prof
Peng CHEN Assist Prof
Hisashi DOI Assist Prof
Akira UMISE Assist Prof
Shukan OKANO Technical Support Staff
Noriko NAKAISHI Technical Support Staff
Tomoko SETOGUCHI Secretary

(1) Outline

1. Bio-functionalization of metals with surface modification
   Bio-functionalization of metals is investigated with surface treatment techniques, such as molecule immobilization and anodic oxidation. These surface treatments make it possible to inhibit protein adsorption, platelet adhesion, and biofilm formation, and to enhance wear resistance and hard-tissue compatibility.

2. Development of novel alloys and porous composites for biomedical applications
   Novel alloy systems for biomedical applications are designed from the viewpoints of mechanical properties and biocompatibility. Co-Cr-Mo alloys having high strength and ductility for dental applications are developed. The porous alloys having low Young’s modulus are obtained with selective laser melting technique.

3. Development of Zr-based alloys for minimizing MRI artifacts
   Zr-based alloys with low magnetic susceptibility, high strength and corrosion resistance are investigated for minimizing MRI artifact by controlling their microstructure and constituent phase for aneurysm clips, artificial joints, and dental implants, etc.

4. Effort to minimalize metal allergy
   Countermeasure techniques for metal ion release from metallic biomaterials which causes metal allergy are investigated. Novel reagents of patch testing for the detection of sensitization to metal ions are developed.

(2) Lectures & Courses

Metallic biomaterials play an important role as medical devices. Our laboratory mainly deals with effects of crystal structure, process, and thermal treatment on mechanical properties (e.g. strength or toughness). We also focus on structure and property of nanometer-scaled surface phenomena: Formation of living tissue on metals, especially, reactions between biomolecules or cells and metals, changes in surface oxide layers in living tissues, and electrochemical property of metallic biomaterials. The aim of the education is perfect understanding of metallic biomaterials, enabling students to select a proper material for medical treatments or researches.

(3) Publications

[Original Articles]

2. Takada R, Jinno T, Tsutsumi Y, Doi H, Hanawa T, Okawa A. Inhibitory effect of zirconium coating to bone bonding of titanium implants in rat femur Mater. Trans.. 2017.01; 58(1); 113-117


[Misc]


[Conference Activities & Talks]

1. Hanawa T. Surface modification of metals with biofunctional molecules to add biofunction. International Workshop: From Amazon Biomolecules to Medical Devices 2017.02.16 Manaus, Brazil

2. Hanawa T. New alloys, process and surface modification techniques for medical implants. EPFL-TMDU Joint Symposium 2017.03.10 Lausanne, Switzerland


5. Chen P. Nanotechnology in implant dentistry and bone regeneration. 1st International Symposium on Precision Medicine and Biomedical Technologies 2017.06.04 Quanzhou, China

6. Hanawa T. Next generation implant surface. The 12th International Workshop on Biomaterials in Interface Science 2017.08.04 Sendai, Miyagi, Japan


12. Hanawa T. Next generation implant materials and surfaces. Biomaterials International 2017 2017.08.21 Fukuoka, Japan


14. Hanawa T. Reaction of yttria-stabilized zirconia surface with water and Hanks’ solution. 28th Annual Conference of European Society for Biomaterials (ESB 2017) 2017.09.04 Athens, Greece

15. Hanawa T. Biofunctionalization of metals meeting clinical demand. 20th Roumanian International Conference on Chemistry and Chemical Engineering (RICCCE 2017) 2017.09.06 Poiana Brasov, Roumania


19. Hanawa T. Surface oxide layer and topography for next generation implants. TACT2017 2017.10.15 Hualien, Taiwan

20. Hanawa T. Effect of topography of titanium surface on adhesion and differentiation of mesenchymal stem cells. The 6th Asian Biomaterials Congress (ABMC6) 2017.10.25 Kerala, India


(1) Outline

(1) Development of Electrovector ceramics
Some ceramics, such as a hydroxyapatite, are able to be ionically polarized by thermoelectrical treatments. Consequently, the polarized ceramics have large and time-durable induced electrostatic charges on their surfaces. The effects of the induced charges profoundly dominate the proximate few millimeter regions. We named the effects “Electrovector effects” and develop “Electrovector ceramics” defined as ceramics emitting the Electrovector Effects.

(2) Control of electrical space on Electrovector ceramic
To translate the Electrovector ceramics into practical applications for medical devices, electrical space on Electrovector ceramics should be suitably controlled under the poling process. We are evaluating the poling mechanisms of some bioceramics, based on the various disciplines. In particular, we are putting emphasis on the relationship between the origin of electrical space and the crystal structure on the surface of the polarized bio-ceramics. The crystal defect, crystal distortion and fine change of ion composition of Electrovector ceramics polarized under various conditions are systematically investigated.

(3) Manipulation of biological responses by Electrovector ceramics
The electrostatic energies of the Electrovector effects aforementioned dominate the limited proximate areas and can control reactions locally. Therefore, the Electrovector ceramics can manipulate biological responses in a target space by both of the surface character and the electrostatic energies of the Electrovector ceramics at ion and tissue levels. We have demonstrated that the Electrovector ceramics enhanced protein adsorption, proliferation, adhesion, and differentiation of cultured cells on the ceramics as well as osteoconductivities in vivo by molecular biological and immunological detections.

(4) Development of applicable devices by ceramic technologies
We apply the Electrovector ceramics aforementioned to implant systems, such as artificial bones, bone joints, tooth roots, and are developing implantable devices with autograft-like osteoconductivities. We are undergoing improvements of sol-gel method for hydroxyapatite thin film coating and materials for vascular regeneration. We are extending our researches based on ceramic technologies farther, such as a control of oral environment, an improvement of oral esthetics, more effective and precise diagnosis systems for clinical laboratory medicine.

(2) Publications

[Original Articles]


[Books etc]


[Conference Activities & Talks]


2. Kosuke Nozaki, Takayuki Endo, Naohiro Horiuchi, Kimihiro Yamashita, Kazuaki Hashimoto, Keiji Itaka, Akiko Nagai. Electrical and structural evaluation of sodium ion doped beta-tricalcium phosphate. The Tenth International Conference on the Science and Technology for Advanced Ceramics (STAC-10) 2017.08.02


[Patents]

1. Material for controlling organisms and for selective adsorption of protein, cement and biomaterial, Patent Number: EU 00104225.8-2107

2. METHOD FOR CONTROLLING ORGANISMS AND MATERIAL THEREFORE, METHOD FOR SELECTIVE ADSORPTION OF PROTEINS AND MATERIAL THEREFORE, CEMENT MATERIAL AND BIOMATERIAL, Patent Number: US6777214B1
Organic Biomaterials

Professor: Nobuhiko YUI  
Assistant Professor: Atsushi TAMURA  
Assistant Professor: Yoshinori ARISAKA  
Researcher: Masahiko TERAUCHI  
Secretary: Nanae NISHI

(1) Research

1. Design of Dynamic Biomaterials Surfaces
Biomaterials surfaces with dynamic properties are designed by utilizing a molecularly movable architecture of polyrotaxanes, and examined their effects on a variety of interactions with living body.

2. Modulation of Cellular Functions by Dynamic Ligand-Polymers
Biologically active ligands are introduced into cyclic molecules in polyrotaxanes, and examined the effects of their movability on multivalent interactions with receptor proteins and the subsequent events including intracellular metabolisms.

3. Modulation of Cellular Functions by Complexation of Intracellular Functional Supermolecules with Biomolecules
Cytcocleavable polyrotaxanes to form complexes with biomolecules such as nucleic acid and protein are designed and their cellular functions are evaluated.

4. Cytcocleavable Polyrotaxanes as Molecular Therapeutics for Congenital Metabolic disorders
Cyclodextrins released from cytcocleavable polyrotaxanes specifically at lysosomes are effective to reduce excess cholesterol accumulation in lysosomes as well as Amerolate impaired autophagy in lysosomal disorders.

(2) Publications

[Original Articles]


5. Atsushi Tamura, Moe Ohashi, Kei Nishida, Nobuhiko Yui. Acid-induced intracellular dissociation of \( \beta \)-cyclodextrin-threaded polyrotaxanes directed towards attenuating phototoxicity of bisretinoids through promoting excretion. Molecular Pharmaceutics. 2017.12; 14(12); 4714-4724

[Books etc]

[Misc]
3. Akihiko Kikuchi, Nobuhiko Yui, Stuart L Cooper, Kazunori Kataoka. In memory of Professor Teiji Tsuruta; great mentor in polymeric biomaterials. J Biomater Sci Polym Ed. 2017.08; 28(10-12); 879-880

[Conference Activities & Talks]
1. Nobuhiko Yui. Directing Cell Fate via Supramolecular Characteristics of Polyrotaxanes. EPFL-TMDU joint Biomaterials & Bioelectronics Symposium 2017.03.10 Lausanne, Switzerland
10. Yuma Yamada, Shinnosuke Daikuhara, Atsushi Tamura, Kei Nishida, Nobuhiko Yui, Hideyoshi Harashima. Validation of autophagy induction via the mitochondrial delivery of polyrotaxane by a MITO-Porter. The 2nd International Symposium on Biomedical Engineering 2017.11.09 Tokyo Institute of Technology, Meguro-ku, Tokyo, Japan
11. Atsushi Tamura, Nobuhiko Yui. Design of $\beta$-cyclodextrin-threaded acid-labile polyrotaxanes for the treatment of Niemann-Pick type C disease. 9th Asian Cyclodextrin Conference (9ACC) 2017.12.15 National University of Singapore, Singapore


13. Kentaro Morita, Taishi Higashi, Xia Song, Jing-ling Zhu, Jun Li, Atsushi Tamura, Nobuhiko Yui, Keiichi Motoyama, Hidetoshi Arima. One-pot synthesis of polycatenanes containing cyclodextrins. 9th Asian Cyclodextrin Conference (9ACC) 2017.12.15 National University of Singapore, Singapore

Medicinal Chemistry

Professor Hirokazu TAMAMURA, Ph.D.
Associate Professor Wataru NOMURA, Ph.D.
Assistant Professor Takuya KOBAYAKAWA, Ph.D.
Support Researcher Ami MASUDA
Technical Assistant Satoko KIKUCHI
Assistant Kayo KANADA, Miho TANABE, Tomoe KAMEI
Adjunct Lecturer Motoyoshi NOMIZU

Graduate students
D3 Shohei TAKETOMI, Kiju KONNO, Kei TOYAMA, Yuzuna HONDA, Maxwell SAKYIAMAH
D2 Daisuke MATSUMOTO, Daisuke MIYAKI
M2 Kento EBIHARA, Tsukasa HASHIMOTO
M1 Tomoki KISHI, Shunsuke SAWAMURA, Kohei TAKAHASHI

External Collaborators
Yuko YAMADA, Takumi KAMIMURA, Masaki KURAKAMI

(1) Outline

Research in the lab is mainly focused on two topics: 1) development of artificial enzymes for regulation of gene functions and (2) exploration and analyses of cellular functions by methods based on peptide chemistry. Students will learn how to design research, experimental techniques, and analysis methods of research data. Research themes are related to multiple research fields such as molecular biology, chemistry, chemical biology, and synthetic biology.

(2) Research

Drug-discovery templates for conformational restriction, which enable pharmacophores of bioactive compounds (ex. peptides) to be suitably disposed in three-dimensional space, are being developed. Drug discovery for the chemotherapy of cancer, AIDS, Alzheimer’s disease, rheumatoid arthritis, SARS, etc. is being performed based on targeting several receptors, enzymes, etc.

Bio-probes that specifically recognize each receptor or enzyme are being developed for research on chemical biology involving imaging and sensing.

3. Structural analysis of the interactions between receptors/enzymes and their ligands.
Using X-ray crystal structural analysis, the mechanism of signal transduction operated by binding of ligands to receptors/enzymes is being analyzed.

Utilizing DNA sequence-specific recognition of zinc finger protein, technologies for DNA recombination, modifications, and DNA labeling are being developed.
(3) Education

Practice
Goals/Outline:
Presenter reports about the recent topics related to molecular biomedicine from Journals. The report must come with the backgrounds and motivations of research fields. Research designs, experimental methods, data analyses, and perspectives for future development will be discussed about the topics. Students are also encouraged to attend to lectures for the graduate course and discuss about the topics with lecturers.

Available programs:
Lectures for the graduate course: as occasion
Journal Club: Every Thursday from 15:00 to 16:30

Lab
Goals/Outline:
Research in the lab is mainly focused to two topics; 1) development of artificial enzymes for regulation of gene functions and (2) exploration and analyses of cellular functions by methods based on peptide chemistry. Students will learn how to design research, experimental techniques, and analysis methods of research data. Research themes are related to multiple research fields such as molecular biology, chemistry, chemical biology, and synthetic biology.

Available program:
Lab meeting (progress report): every week, about 1 hour per person (will be announced)

(4) Lectures & Courses

Format:
Small group

Venue:
Practice: Third laboratory room (603) at Institute of Biomaterials and Bioengineering
Lab: Laboratory of Medicinal Chemistry (602) at Institute of Biomaterials and Bioengineering

Grading:
Practice: Attendance and report
Lab: Progress of research and report

(5) Publications

[Original Articles]


[Books etc]


[Conference Activities & Talks]

1. Hashimoto T, Nomura W, Ohura I, Tamamura H. Improved split DNA methylase activity by optimization of assembly on target sites. Keystone Symposia Precision Genome Engineering 2017.01.08 Breckenridge, USA
3. Matsumoto D, Nomura W, Tamamura H. Controllable genome editing by chemically inducible split site-specific nucleases. Keystone Symposia Precision Genome Engineering 2017.01.08 Breckenridge, USA
7. Tamamura H. Rigid bivalent ligands of the chemokine receptor CXCR4 and their anti-cancer metastasis activity. KCS Biochemistry Division Summer Workshop 2017.06.27 Jeju, Korea
9. Nomura W, Matsumoto D, Hashimoto T, Sugii T, Tamamura H. Development of chemical-inducible artificial transcription factors based on sequence-specific DNA binders. the 254th ACS National Meeting and Exposition 2017.08.20 Washington DC, USA
11. Tamamura H. Synthesis of chloroalkene dipeptide isosteres as peptidomimetics and their biological application. 12th Australian Peptide Conference 2017 2017.10.17 Noosa, Australia
(1) Research

1. Carcinogenesis and molecular mechanism
2. Functions of cancer-associated genes and their alterations
3. Genomic, epigenomic and proteomic analysis of cancer and personalized medicine
4. Tumor microenvironment
5. Cancer stem cells/non-coding RNA/signaling pathway
6. Molecular target/drug delivery/diagnosis and therapy

(2) Education

To learn knowledge and skill for cancer research, students attend lectures and seminars, and attend and/or practice research meeting, journal club, scientific meeting, etc. These practices will enable students to develop an ability to conduct their studies as an
independent cancer researcher in the future. To obtain good skills to carry out experiments that are required for cancer research, students belong to one of our research groups, and conduct their own studies under the guidance of the instructor and/or staff. Students perform various experiments involved in genetics, gene technology, biochemistry, cellular biology, molecular biology, physiology, experimental animal, pathology, genomic/epigenomic/proteomic analysis, imaging, next generation sequencing, etc.

(3) Publications

[Original Articles]


11. Nagasato M, Rin Y, Yamamoto Y, Henmi M, Hiraoka N, Chiwaki F, Matsusaki


[Reviews Articles]


[Conference Activities & Talks]


Cellular and Molecular Medicine

associate professor Yumiko Oishi MD., Ph.D
assistant professor Sumio Hayakawa Ph.D
assistant professor Shinichiro Hayashi Ph.D(-July 2017)

(1) Outline

Cardiovascular disease, as a consequence of the obesity related metabolic syndrome, remains a significant cause of morbidity and mortality in industrialized societies. A major effort of our laboratory has been to investigate the molecular mechanism of an initiation and progression of metabolic syndrome from the viewpoint of transcriptional regulation. Since macrophages contribute to all phases of the pathogenesis of atherosclerosis, we have extensively studied the macrophage diversity that respond to various stress within tissue environment. Additionally, it is recognized that sarcopenia (skeletal muscle loss with) is important for the pathogenesis of metabolic syndrome. The long term goals of our current study are to elucidate: 1) the mechanism of the link between cellular metabolism and immune response of macrophage 2) the mechanism of chronic inflammation that leads to metabolic syndrome, and 3) the mechanism responsible for pathogenesis of sarcopenia and skeletal muscle degeneration.

(2) Research

1. Mechanisms of Coordinated regulation of inflammatory response and lipid homeostasis in macrophage

Chronic low-grade inflammation has been recognized as a key contributing factor in the onset and progression of metabolic syndrome and atherosclerosis. As a multifunctional effector cell, macrophage play pivotal roles in both the enhancement and resolution of this inflammatory process. By utilizing molecular biology technique, lipidomics and bioinformatics, we found that the lipid homeostasis is coordinately regulated with inflammatory response in macrophage. TLR4 activation rapidly, and transiently inhibits Liver X receptor (LXR) signaling, and subsequently activates Sterol regulatory element-binding protein (SREBP). In the late phase of inflammation, LXR and SREBP work together to increase anti-inflammatory fatty acid synthesis, necessary for a resolution of inflammation. Thus, transcriptional/signaling network involving LXR and SREBP play a pivotal role in the regulation of lipid homeostasis and cellular function. By elucidating the crosstalk between cellular function and metabolism, we would be able to accumulate beneficial knowledge to develop novel therapeutic strategy targeting macrophages for the prevention and treatment of metabolic syndrome.

2. Mechanism of skeletal muscle degeneration

Skeletal muscle consume 40% of total energy, playing a key role for the pathogenesis of metabolic syndrome. Sarcopenia is the degenerative loss of skeletal muscle mass, quality and strength associated with aging. Although the causes and mechanisms of sarcopenia still remains unclear, one of the hypotheses is reduction of the number of satellite cells, stem cells in adult muscle, and failure of satellite cell activation. We identified KLF5 as a novel factor that play a pivotal role in skeletal muscle degeneration. Klf5 is a Zinc-finger transcription factor involved in the self-renewal and proliferation of embryonic stem cell and cancer stem cell. KLF5 is transiently induced in the myoblast during differentiation and it plays critical role for muscle degeneration and repair. Although Klf5 is not expressed in the quiescent satellite cells, its expression is dramatically increased in the satellite cells with age. Now we are testing the hypothesis whether the dysregulation of Klf5 causes a malfunction of satellite cells.
(3) **Education**

Lecture: Doctoral Program, Life Science and Technology Track #6110, Bioscience I
Lecture: Master’s Program, Medical and Dental Science and Technology Track, Molecular biology
Lecture: School of Dentistry, Second grade, Basic molecular mechanisms of life
Lecture: School of Medicine, Third grade, Public health

(4) **Publications**

[Original Articles]


[Conference Activities & Talks]

1. Yumiko Oishi. SREBP1 contributes to resolution of pro-inflammatory TLR4 signaling by reprogramming fatty acid metabolism. 11th International Symposium of the Institute Network 2017.01.26 Tokushima, Japan

2. Yumiko Oishi. Coordinated regulation of inflammatory response and fatty acid metabolism in macrophage. Transborder medical research center international symposium, Tsukuba University 2017.06.17 Tsukuba, Japan
Lifetime Oral Health Care Sciences

Professor Shinichi ARAKAWA
Junior Associate Professor Keiko KONDO
Assistant Professor Masayo YASUDA
Specially Appointed Assistant Professor Natsumi NAKAMURA
Graduate Student Anongwee LEEWANANTHAWET, Yuko INOUE
Resident Wataru ONO, Masayuki TOI

(1) Outline

Main objective of Lifetime Oral Health Care Sciences is to understand and learn how oral health care contributes to the preservation of general health and healthy life expectancy. Students also learn the newest knowledge on oral pathology and oral health promotion, and are trained to master the modality of oral health care.

Regarding research, the effects of the functional waters to organism and clinical application of them were investigated.

(2) Research

1) Clinical and basic studies on Ozone ultrafine-bubble water (NBW3) : antimicrobial activity and effects to eukaryotic cells (induction of anti-oxidant capacities and wound healing activities etc.)
2) Study on virulence factors of periodontopathic bacteria
3) Development of education system for dental (oral) hygienists to prevent oral diseases
4) Development of assessment program in technical education for dental (oral) hygienists

(3) Education

Main objective of Lifetime Oral Health Care Sciences is to understand and learn how oral health care contributes to the preservation of general health and healthy life expectancy. Students also learn the newest knowledge on oral pathology and oral health promotion, and are trained to master the modality of oral health care.

(4) Lectures & Courses

Main objective of Lifetime Oral Health Care Sciences is to understand and learn how oral health care contributes to the preservation of general health and healthy life expectancy. Students also learn the newest knowledge on oral pathology and oral health promotion, and are trained to master the modality of oral health care

(5) Clinical Services & Other Works

Oral care clinic provides prevention of oral diseases, such as dental caries or periodontal diseases for maintaining patients’ oral and general health in a lifetime.
(6) **Clinical Performances**

Oral care clinic provides prevention of oral diseases, such as dental caries or periodontal diseases for maintaining patients’ oral and general health in a lifetime.

(7) **Publications**

**[Original Articles]**


2. Shinichi Arakawa, Mitsuru Sugisawa, Anongwee Leewanthawet. Application of ozone nanobubble water (ONBW) to peri-implantitis treatment *Dentistry*. 2017.12; 7(12);

**[Misc]**


**[Conference Activities & Talks]**

1. 荒川真一. Clinical Application of Ozone Nano-Bubble Water (NBW3) to Peri-implantitis Treatment. The 24th International Conference and Exhibition on Dentistry & Oral Care 2017.04.17 Dubai, UAE

2. Shinichi Arakawa. Clinical application of Ozone nano-bubble water -periodontitis & peri-implantitis-. 2017.04.19 Dental College, Gulf Medical University (UAE)

3. The clinical and educational effects of the newly-introduced interprofessional clinical practice. 2017.05.12

4. The clinical and educational effects of the newly-introduced interprofessional clinical practice. 2017.05.13


**[Awards & Honors]**

1. Advanced Education System Development(Kanako Noritake), Japanese Dental Education Association, 2017.07
Oral Care for Systemic Health Support

Professor KABASAWA Yuhji

(1) Outline

(1) Education
We teach the knowledge and skills necessary for oral health activities through classes in charge. Specifically, we will teach about the relationship between oral health and general health such as perioperative oral function management and periodontal disease and diabetes. In addition to teaching health assessment of the oral and maxillofacial area, we will acquire basic knowledge and skills through vital signs measurement practice, emergency life-saving activity practice, which is one of general health evaluation indicators.
Furthermore, we lecture on the pathology, pathology, diagnosis and treatment related to mandibular oral cavity disease, and teach necessary knowledge on oral health education, prevention of oral diseases of people with basic diseases in the medical field.

(2) Research
We will conduct research to support maintenance and promotion of health by oral health. Especially contribute to people’s health and well-being through research on perioperative oral cavity function management, research on oral care of people with underlying diseases, research on regeneration of jawbone with FGF-2, etc.

(3) Clinical
In order to maintain and promote general health through oral health, we cooperate with each outpatient at the dentistry hospital and do dental prophylactic treatment of the patient and oral health education at oral care outpatient. In addition to oral care for inpatients at dental and medical hospital while working in cooperation with nurses, nutritionists, pharmacists and others, they practice oral care according to the condition of patients as a member of team medicine.

(2) Research

1. Oral health care of patients with oral cancer, cleft lip and palate and other oral diseases
2. Oral health related QOL of patients with oral cancer, cleft lip and palate, dry mouth
3. Basic research of tooth brush, peeling sponge and tooth paste
4. Morphological, functional research, and oral health of patients with cleft lip and palate
5. Research for safety in supplements in oral functions

(3) Lectures & Courses

From the standpoint of oral health and general health, educate dental hygienists who can contribute to people’s health and welfare by teaching the knowledge and skills necessary for oral health care centering on oral medicine education.

(4) Clinical Services & Other Works

Oral care department, in cooperation with each outpatient in the dental school attached hospital, in order to maintain and improve the general health through oral health, do patients’ dental preventive measures and oral
health education in oral care outpatient. In addition, we do oral care for hospitalized patients in the dentistry department and medical hospital affiliated hospitals, we receive consultation about patient oral care from ward nurses, and instruct oral care methods according to patient condition. In oral surgery unit, we are engaged in diagnosis, treatment, oral health guidance etc of various oral disease patients.

(5) Clinical Performances

Based on knowledge of oral medicine through oral care department, we are conducting perioperative oral function management with more specialized expertise.
Preventive Oral Health Care Sciences

Professor Kayoko SHINADA
Assistant Professor Hiromi OTSUKA
Part-time lecturer Atsushi OHYAMA
Graduate Students Master Course
Tomomi ABE,
Makoto KAWANO,
Chie YOSHIZU,
Shin Yujeong,
Liao Shin Ru,

(1) Outline

In order to cultivate students’ abilities to prevent and detect oral diseases at an early stage, which are important to maintain and improve the nation’s health, we help students acquire deep academic knowledge and high standard skills in preventive oral health care such as skills to check over the condition of oral cavities. Additionally, we help students develop skills to provide oral health counseling and oral health promotion, and nurture human resources who can actively contribute the development of oral health promotion.

(2) Research

1) Preventive Oral Health Care Sciences
   ① Incident factors and preventive methods on dental caries
   ② Incident factors and preventive methods on periodontal disease
   ③ Incident factors and preventive methods on oral malodor
   ④ Incident factors and preventive methods on other oral diseases

2) Development of education system for the patients to prevent oral diseases and for dental hygiene students.

3) Development of new assessment programs in technical education for dental hygienist students.

(3) Clinical Services & Other Works

In our Oral Health Care Clinic, dental hygienists support patients’ oral health care, and prevent dental caries and periodontal diseases, for the patients to maintain their oral health for the entire lifetime.

(4) Publications

[Original Articles]

Reverse Reactions of Secondary Alcohol Dehydrogenase for Breath Isopropanol and Acetone as Potential Volatile Biomarkers of Diabetes Mellitus. Anal Chem. 2017.11; 89(22); 12261-12268

[Books etc]

[Conference Activities & Talks]

[Awards & Honors]
1. Advanced Education System Development(Kanako Noritake), Japanese Dental Education Association, 2017.07
Oral Hearth Sciences for Community Welfare

Professor Junichi FURUYA
Junior Associate Professor Keiko ENDO
Graduate Student Michiyo OBANA
Graduate Student Chiaki MATSUBARA
Graduate Research Student Junji TOKUNAGA

(1) Outline

The role of Department of Oral Health Sciences for Community Welfare is to develop education, practice, research for turning out dental profession who can play an important role as profession of oral function and eating in medical care and welfare of super-aging society. All of our research and education is based on daily medical and dental care so that we can produce medical and dental professions who can work globally and locally.

The department is particularly focusing on improving oral health such as mastication, swallowing, dentures and oral hygiene through dysphagia rehabilitation, diet modification support, multi-disciplinary team approach so that the department contributes to prevent and improve aspiration pneumonia, malnutrition, and quality of life. Recently, we're also focusing on oral function of stroke patients and community cooperation, oral function of dementia and MCI patients and dental care, and dentures and swallowing in team approach.

All educational and research activities are based on clinical practice and experiences so that knowledge and skills of oral function will be acquired. Concretely, oral functional rehabilitation and oral hygiene care are performed as oral health management for hospitalized and institutionalized patients, and out patient in clinic. In addition, we supply multi-disciplinary team approach as a member of NST (Nutrition Support Team), PCT (Palliative Care Team), Oral hygiene care team in medical hospital of TMDU, and Visiting Dysphagia Rehabilitation Team.

(2) Research

1. Mastication and swallowing, nutrition, enjoyment of eating in older people
2. Dysphagia rehabilitation and oral health sciences in home-visiting dentistry
3. Oral function and general health, oral health care, and welfare for stroke and dementia patients
4. Dysphagia rehabilitation for older people and disabled people, exercise, nursing-care, and welfare
5. Preoperative oral health and oral hypo-function in Frailty care, Palliative care, Nutrition support care

(3) Education

Gerodontology
Welfare for older people
Nursing-care for older people
Prosthodontics
Home visiting dentistry
Community dental care
Social work
etc
(4) Publications

[Original Articles]
1. Keiko Endo. Elderly dietary education 2017.01;

[Conference Activities & Talks]
1. Koichiro Matsuo, Hiroshi Taniguchi, Kazuharu Nakagawa, Junichi Furuya, Manabu Kanazawa, Shunsuke Minakuchi. The changes in tongue pressure, grip strength and nutritional status during perioperative period in cancer patients. The 25th annual meeting of Dysphagia Research Society 2017.03.03
2. Onodera S, Furuya S, Yamamoto H, Hara A, Aki S, Tamada Y, Matsuki K, Itsukaichi A, Kondo H. Impacts of complete dentures on oropharyngeal movements during bolus processing. 95th general session of international association of dental research 2017.03.25 San Francisco
3. Masayo Sunaga, Hiromi Otsuka, Junichi Furuya, Yumi Hoshino, Atsuhiro Kinoshita. Development and evaluation of computer-assisted learning material regarding oral health care methods for elderly persons requiring long-term care as inter-professional education material for dental hygiene students. 39th Asia Pacific Dental Congress 2017.03.25 Macau, China
6. Michiyo Obana, Chiaki Matsubara, Keiko Endo, Junji Tokunaga, Junichi Furuya, Tomohisa Ohno, Yasunori Sumi. Oral moisturizing method and oral hygiene care; a simulation study. The 82nd Annual meeting of the Stomatological society 2017.11.19 Tokyo, Japan
Oral Health Care Education

Professor Naomi Yoshida
Junior Associate Professor Yuki Ohara

(1) Research

1) Research on oral health behavior
2) Research on oral health management
3) Research on frailty and oral frailty
4) Research and development of education methods in dental hygienists education

(2) Education

Oral health care education is a special field of study which deals with the establishment of theoretical and practical skills to contribute to the development of health. Educational objectives of Oral health care education in the graduate course are to foster human resources who will be able to implement health promotion programs in collaboration with other career or residents in many fields.

(3) Clinical Services & Other Works

In oral health care clinics, dental hygienists support patients’ oral health care, and prevent dental caries and periodontal diseases for the patients to maintain their oral and general health in the entire lifetime.

(4) Publications

[Original Articles]

[Conference Activities & Talks]


[Awards & Honors]

1. Advanced Education System Development(Kanako Noritake), Japanese Dental Education Association, 2017.07
Basic Sciences of Oral Health Care

Junior Associate Professor Yujiro Sakamoto

(1) Outline

Graduate School of Medical and Dental Sciences has been reorganized in April 2012, and the section of Basic Sciences of Oral Health Care was established in Medical and Dental Science and Technology master’s program course.

(2) Research

1) Basic medical and dental studies for oral health care
2) Basic study on clinical application of oral health care
3) Gross anatomical study of head and neck region

(3) Education

Purpose of Education

Basic sciences of oral health care is a branch of morphological sciences, developmental biology, pathology and the neurosciences to understand the structure and function of human body and its pathological conditions. Students are taught in more detail about the normal tooth anatomy and occlusal function as well as the anatomy of the head and neck with specific attention to the skull, muscles, nerves, and arteries associated with the mouth and teeth. In addition, students are also taught the oral pathology and dental pharmacology and pharmaceutics.

Subjects and contents.

- Structure and function of human body I and II: anatomy, histology, physiology, embryology, oral anatomy, oral histology, oral physiology.
- Mechanism of disease and promotion of recovery process: pathology, oral pathology, microbiology, immunology, pharmacology.
- Dental Pharmacology and Pharmaceutics.
- Graduation thesis:

(4) Publications

[Original Articles]

1. Sakamoto Y. Configuration of the extrinsic muscles of the tongue and their spatial interrelationships. Surgical and Radiologic Anatom. 2017; 39(5); 497-506

2. Sakamoto Y. Morphological features of the branching pattern of the hypoglossal nerve. Anatomical Record. 2017; In press;

[Conference Activities & Talks]


2. Sakamoto Y. Gross anatomical observation of the spatial relations between the branches of the hypoglossal nerve. The 34th annual meeting American Association of Clinical Anatomists 2017.07.20 Minneapolis, USA.
Basic Oral Health Engineering

Professor Kazuhiro Aoki
Associate Professor Meiko Oki
Assistant Professor Shingo Kamijo

(1) Outline

Basic Oral Health Engineering is a department assigned to basic science field of oral health in three master course departments which were reorganized from the departments of Oral Health Engineering Course in 2015. The department is originated in Basic Oral Health Sciences. The department of Basic Oral Health Engineering aims to create a scientific foundation for the clinical applications based on interdisciplinary research between engineering and biology and/or interface studies between basic and clinical sciences. We believe that these research activities, which are focused on the region of the oral cavity, can contribute to attaining healthy and happy living conditions. We have the responsibility to train our students to be medical personnel who are eager to contribute to people's happiness through a broad range of educational courses from basic level courses to professional level courses, which integrate areas of study such as the structure and function of the human body, stomatognathic region, pharmacology and the research process.

(2) Research

Research Subjects
1) The development of surface coating materials for the prevention of plaque growth
2) Research related to the connection between oral bacteria and systemic health
3) The development of non-invasive methods of bone mass augmentation
4) The fabrication of facial prostheses using a three-dimensional rapid manufacturing method
5) Clinical studies of treatments for patients with maxillofacial defects
6) The development of materials for facial prostheses
7) The relationship between “medical care to support life” and the dental technician
8) The education of dental technicians using computer simulation training

(3) Lectures & Courses

Basic Oral Health Engineering is a department of oral health engineering which deals with the basic oral health sciences to perform evidence-based oral health care and prosthetic treatments to support people to promote oral health and improve quality of life. Main objective of Basic Oral Health Engineering in the undergraduate course is to provide students opportunity to study the structure and function of the human body, pharmacology, fabrication of dental and maxillofacial prostheses, dental CAD/CAM technology and research process.

(4) Clinical Performances

Clinical activities
· Maxillofacial prosthetic rehabilitation for patients with maxillofacial defects
· Making dental and maxillofacial prostheses
(5) Publications

[Original Articles]

1. Sasipin Lauvahutanon, Maho Shiozawa, Hidekazu Takahashi, Naohiko Iwasaki, Meiko Oki, Werner J. Finger, Mansuang Arksornnukit. Discoloration of various CAD/CAM blocks after immersion in coffee. Restorative Dentistry and Endodontics. 2017.01; 42(1); 9-18


8. Toru Takemoto, Yuji Kabasawa, Yusuke Higuchi, Yasuhiko Tabata, Kazuhiro Aoki, Yukihiko Tamura, Hiroyuki Harada. Combination of the RANKL-binding peptide W9 and bFGF induces bone regeneration in the rat calvarial defect model. Dent Oral Craniofac Res. 2017.12; 4(3); 1-7


[Conference Activities & Talks]

1. Shingo Kamijo, Kumiko Sugimoto, Meiko Oki, Tetsuya Suzuki . Investigation of the needs for prostheses and dental technicians in home-visit dental care in Japan. 6th International Congress of Dental Technology 2017.05.27 New Taipei City, Taiwan

2. Kazuhiro AOKI. Roland gave me a seed of my research. The 59th Annual Meeting of Japanese Association for Oral Biology 2017.09.16 Matsumoto Dental University

[Others]

1. The Wnt agonist R-spondin 3: an unexpected negative regulator of bone formation, 2017.11 Special lecture for PhD course student
   Dr. Kenichi Nagano Department of Oral Medicine, Infection and Immunity, Harvard School of Dental Medicine
Oral Biomaterials Development Engineering

Professor
Junior Associate Professor
Assistant Professor
Graduate student (Master course)
Graduate student (Master course)
Graduate student (Doctor course)

Hidekazu TAKAHASHI
Tohru YASUE
Naohiko IWASAKI
Yuko NAKAJIMA (until March)
Yusuke YAMAMOTO (from April)
Patcharanun CHAIAMORNSUP (Advanced Biomaterials)

(1) Outline

Basic knowledge of dental materials and devices for oral health engineering are provided for student. Basic exercise for dental materials and prosthetic training are also provided. Development and evaluation of new dental materials are preformed.

(2) Research

1. Evaluation of various factors on mechanical properties of teeth substance.
2. Evaluation of fatigue properties of dentin and dental materials using miniature testing pieces
3. Measurement of characteristics of dental ceramic materials and establishment of new testing methods for dental ceramics
4. Measurement of precise deformation using non-contact methods
5. Development of new composite resin with similar machinability of dentin
6. Study on dental root fracture mechanism
7. Application of various types of fiberglass for dentistry
8. Evaluation of composite resin mechanical properties and improvement their bonding efficiency to various materials.
9. Evaluation of impact force absorption of mouthguard and face protect materials

(3) Education

Dental material science is not only one of basic medical and dental science but also one of clinical dental science. In our department, we will educate students to obtain practical knowledge of the dental materials and devices used in dentistry and to improve skill how to deal with these materials and devices. Our goals of education are to achieve high quality of dental practice with well-understanding dental material and devices. The aim for education is to obtain the basic knowledge of dental material science and technology. The lecture is simultaneously provided with the laboratory instructions within the limit of the possible.

(4) Lectures & Courses

Dental material science is not only one of basic medical and dental science but also one of clinical dental science. In our department, we will educate students to obtain practical knowledge of the dental materials and devices
used in dentistry and to improve skill how to deal with these materials and devices. Our goals of education are to achieve high quality of dental practice with well-understanding dental material and devices. The aim for education is to obtain the basic knowledge of dental material science and technology. The lecture is simultaneously provided with the laboratory instructions within the limit of the possible. Presentation not only domestic but also international meeting is strongly encouraged.

(5) Clinical Services & Other Works

Participation in various congresses are strongly recommended. Assistance for standard publication is also cooporated. Especially, Prof. Takahashi, head of Oral Biomaterials Engineering acts as the chairperson of ISO TC106 Dentistry/SC9 Dental CAD/CAM systems for publishing ISO standards.

(6) Publications

[Original Articles]

1. Sasipin Lauvahutanon, Maho Shiozawa, Hidekazu Takahashi, Naohiko Iwasaki, Meiko Oki, Werner J. Finger, Mansuang Arksornnukit. Discoloration of various CAD/CAM blocks after immersion in coffee. Restorative Dentistry and Endodontics. 2017.01; 42(1); 9-18


[Books etc]


[Conference Activities & Talks]


7. Mechanical properties of recent composite resin blocks for CAD/CAM. 2017.10.14

8. Hidekazu TAKAHASHI, Naohiko IWASAKI, Tetsuya SUZUKI. FLEXURAL PROPERTIES OF RECENT COMPOSITE RESIN BLOCKS FOR CAD/CAM. 3rd ANNUAL MEETING of the IADDM 2017.12.09 Berlin, Germany
Oral Prosthetic Engineering

Professor Tetsuya SUZUKI
Junior Associate Professor Masaomi IKEDA
Research Associate Maho SHIOZAWA

(1) Outline

Oral Health Information Technology educates deepen understanding of the production of the dental prosthesis using the latest computer science and cultivate basics power to new technology development. This course cultivates the ability to offer high quality medical technology taking advantage of expertise or knowledge. And the purpose of this section is to educate professional dental technologists who has ability to apply newly developed materials and technologies and who is able to contribute in not only clinical situation but also research institution or educational organization at international levels. Presently, the latest technologies such as dental implant and dental CAD/CAM etc became popular by the development of materials and the progress in technologies among dental treatment. Therefore, it is necessary to understand and lean knowledge about newly developed materials and technologies for properly control the dental laboratory works. Furthermore, It is necessary that the communication skill for report information about the materials and technologies to dentists and dental hygienists. Based on these evidences, it is an education in which specialists are raised to not be bound by classification as technologist and have ambition.

(2) Research

1) The advanced technology which utilized a CADCAM system.
2) The education of dental technician which utilized computer simulation training.
3) Relation of *medical care to support life* and the dental technician.
4) Evaluation of newly developed materials.

(3) Education


(4) Publications

[Original Articles]

2. Sasipin Lauvahutanon, Maho Shiozawa, Hidekazu Takahashi, Naohiko Iwasaki, Meiko Oki, Werner J. Finger, Mansuang Arkornmukit. Discoloration of various CAD/CAM blocks after immersion in coffee. Restorative Dentistry and Endodontics. 2017.01; 42(1); 9-18


[Conference Activities & Talks]


3. Shingo Kamijo, Kumiko Sugimoto, Meiko Oki, Tetsuya Suzuki. Investigation of the needs for prostheses and dental technicians in home-visit dental care in Japan. 6th International Congress of Dental Technology 2017.05.27 New Taipei City, Taiwan

4. Tetsuya Suzuki. Efficient and prospective teeth arrangement for complete dentures. The 6th International Congress of Dental Technology 2017.05.27 Taiwan (New Taipei City)

5. Takahashi H, Sumida K, Iwasaki N, Suzuki T. Effects of porcelain thickness and type of alloys on color appearance of porcelain-fused-to-metal restoration. The 6th International Congress of Dental Technology 2017.05.27 Taiwan (New Taipei City)

6. Dhaifallah Alqarni, Keiichi Hosaka, Teerapong Mamanee, Masatoshi Nakajima, Masaomi Ikeda, Junji Tagami. Effect of different surface treatments on repair uTBS of composite bonded to resin matrix after water exposure. The 10th World Congress of International Federation of Esthetic Dentistry 2017.09.14 Toyama


11. Hidekazu TAKAHASHI, Naohiko IWASAKI, Tetsuya SUZUKI. FLEXURAL PROPERTIES OF RECENT COMPOSITE RESIN BLOCKS FOR CAD/CAM. 3rd ANNUAL MEETING of the IADDM 2017.12.09 Berlin, Germany
Patients died of chronic liver diseases, including liver cancer, are about 40,000 persons per a year in Japan. Liver transplantation remains the only effective treatment available to patients with end-stage liver diseases. Because of a serious shortage of donors for allogeneic liver transplantation, an alternative therapy is needed. Prevention of hepatocarcinogenesis and hepatic fibrosis is also necessary for patients with chronic hepatitis, and the development of effective treatment for progressive liver diseases has been quite essential. We believe that the central role of clinical departments in the graduate school of TMDU is to establish basis for the innovative medical treatment in the next generation. To achieve our mission, both basic research lead by clinical concepts and development of novel therapeutics established upon basic research are required.

Our section is a donation-funded department collaborating with the Department of Gastroenterology and Hepatology in TMDU. Most of basic research projects, education for students, and clinical contributions including multicenter studies are collaboration with the Department of Gastroenterology and Hepatology in TMDU. The goal of our education is to promote students to become a well-developed hepatologist, and also a leading expert in the field of Hepatology and Gastroenterology.

Research

Our principle is to achieve a research evoked from various clinical problems, and also directed to launch innovative therapeutic procedures to the daily clinical practice.

We focus on the basic studies of molecular mechanism regulating development, pathophysiology, progression, and therapeutic resistance of hepatocellular carcinoma (HCC). We also focus on the development of novel disease models using human induced pluripotent stem cells, the research for molecular mechanisms regulating liver tissue regeneration and hepatic fibrogenesis, the study for molecular mechanisms regulating differentiation of hepatic stem/progenitor cells, analysis of mechanisms regulating escape of hepatitis viruses from innate immune systems in host cells, and factors for therapeutic resistance against antiviral agents.

Research projects

- Research for mechanism regulating development, pathophysiology, progression, and therapeutic resistance of HCC, based on molecular biology and genome informatics
- Development of novel disease models using human induced pluripotent stem cells to elucidate the pathophysiology of liver diseases
- Research for molecular mechanisms regulating liver tissue regeneration and hepatic fibrogenesis
- Research for molecular mechanisms regulating differentiation of hepatic stem/progenitor cells
- Analyses of molecular mechanisms regulating escape of hepatitis viruses from innate immune systems in host cells, and clinical factors for therapeutic resistance against antiviral agents.

### (3) Education

Primary goal for education in our section is to train highly educated and experienced clinician-researchers in the field of hepatology. Our goal for education of graduate students is to produce clinical researchers thinking from a wide perspective and to bring up leaders of the next generation in hepatology.

### (4) Lectures & Courses

Our lectures and courses are collaboration with the Department of Gastroenterology and Hepatology in School of Medicine, TMDU. We also educate clinical residents in Medical Hospital of TMDU and graduate students of the Department of Gastroenterology and Hepatology, in TMDU in collaboration with such department.

### (5) Clinical Services & Other Works

For the treatment of patients with diseases of liver, biliary duct, and pancreas in Medical Hospital of TMDU, we collaborate with the Department of Gastroenterology and Hepatology in TMDU. In the clinical section, we pursue development and application of highly advanced technologies, including novel procedures, for sophisticated diagnosis and treatment of diseases of liver, biliary duct, and pancreas. We also operate a lot of multicenter study collaborating with the Department of Gastroenterology and Hepatology in TMDU. We participate in four research projects for treatment and eradication of hepatitis virus funded by Japan Agency for Medical Research and Development (AMED). We published a lot of studies in peer-reviewed international journals and presented the recent works in a lot of international and domestic conferences as described below.

### (6) Clinical Performances

For the treatment of patients with diseases of liver, biliary duct, and pancreas in Medical Hospital of TMDU, we collaborate with the Department of Gastroenterology and Hepatology in TMDU. We have recently established the outpatient department specialized for chronic hepatitis, cirrhosis, and HCC. We have operated a lot of multicenter study about efficacy of treatment against viral hepatitis, named as “Ochyanomizu Liver Conference”. More than 2000 patients with viral hepatitis were enrolled in such studies. We have clarified the clinical factors predicting accurately the therapeutic prognosis and risk for development of HCC. We are developing the screening programs for the early detection of HCC in patients with chronic hepatitis after eradication of viruses utilizing non-invasive elastography, novel serum markers, and dynamic contrast-enhanced ultrasonography. For the treatment of HCC, three-dimensional location and structure of tumors and vessels are evaluated by multilateral approaches using dynamic contrast-enhanced ultrasonography, Gd-EOB-DTPA enhanced MRI, and real-time virtual ultrasonography (RVS). We have reported the utility and safety of such therapeutic approaches. We are providing patients the appropriate therapeutic option based on collective multimodal therapeutic strategy in collaboration with departments of surgery and radiology.

### (7) Publications

[Original Articles]


2. Kentaro Matsuura, Hiromi Sawai, Kazuho Ikeo, Shintaro Ogawa, Etsuko Iio, Masanori Isogawa, Noritomo Shimada, Atsunasa Komori, Hidenori Toyoda, Takashi Kumada, Tadashi Namisaki, Hitoshi Yoshiji,
Naoya Sakamoto, Mina Nakagawa, Yasuhiro Asahina, Masayuki Kurosaki, Namiki Izumi, Nobuyuki Enomoto, Atsunori Kusakabe, Eiji Kajiwara, Yoshihito Itoh, Tatsuya Ide, Akihiro Tamori, Misako Matsubara, Norifumi Kawada, Ken Shirabe, Eiichi Tomita, Masao Honda, Shuichi Kaneko, Sohji Nishina, Atsushi Suetsugu, Yoichi Hiasa, Hisayoshi Watanabe, Takuya Genda, Isao Sakaida, Shuhei Nishiguchi, Koichi Takaguchi, Eiji Tanaka, Junichi Sugihara, Mitsuo Shimada, Yasuteru Kondo, Yosuke Kawai, Kaname Kojima, Massao Nagasaki, Katsushi Tokunaga, Yasuhiro Watanabe, Genome-Wide Association Study Identifies TLL1 Variant Associated With Development of Hepatocellular Carcinoma After Eradication of Hepatitis C Virus Infection. Gastroenterology. 2017.05; 152(6); 1383-1394


[Conference Activities & Talks]


stern cell–derived hepatic cells for analyses of changes in host-innate immune responses . AASLD The Liver Meeting 2017 2017.10.22 Washington D.C (USA)

Endowed Departments

Department of Advanced Therapeutics for GI Diseases

Professor Tetsuya NAKAMURA
Associate Professor Katsuyoshi MATSUOKA
Associate Professor Takashi NAGAISHI
Assistant Professor Michio ONIZAWA
Graduate Student Yuka MATSUMOTO (-03/2017), Shintaro AKIYAMA (-03/2017)

(1) Outline

The goal of our department is to develop novel therapeutic strategies for inflammatory bowel diseases (IBD) in humans. With multiple layers of support of corporations who wish to contribute to our mission, we have been focusing on IBD research from the clinical and basic science perspectives, providing an exceptional education program for graduate students at TMDU.

(2) Research

Our research activities focus on the key areas listed below. We have a particular emphasis on translational (bench to clinic) research on IBD.
- Research on the intestinal epithelium to develop regenerative medicine approaches for IBD
- The study of mucosal immunology to develop novel approaches for the diagnosis and treatment of IBD

(3) Education

We share our expertise and teaching program in graduate course education with the Department of Gastroenterology and Hepatology at TMDU. We are also involved in many programs designed for undergraduates.

(4) Lectures & Courses

Our goal is to create future leaders who are able to reach the highest level of quality in IBD research through the training of fellows and graduate/undergraduate students.

(5) Clinical Services & Other Works

We focus on developing highly advanced technologies, including novel procedures, for diagnosis and treatment of IBD in collaboration with the Department of Gastroenterology and Hepatology at TMDU. In addition, we have been playing a major role in nation-wide survey and multi-center studies on IBD, which is funded by the Japanese Ministry of Health, Labor and Welfare.
(6) **Clinical Performances**

- Development of new treatment protocol for IBD patients with stem cell therapy or immunomodulators.
- Development of minimally-invasive diagnostic modalities for inflammatory bowel diseases (i.e. MRE).
- Diagnosis and treatment of small intestinal lesions of inflammatory bowel diseases by double-balloon enteroscopy.

(7) **Publications**

[Original Articles]


5. Shinya Sugimoto, Makoto Naganuma, Yasushi Iwao, Katsuyoshi Matsuoka, Masayuki Shimoda, Shuji Mikami, Shinta Mizuno, Yoshihiro Nakazato, Kosaku Nanki, Nagamu Inoue, Haruhiko Ogata, Takanori Kanai. Endoscopic morphologic features of ulcerative colitis-associated dysplasia classified according to the SCENIC consensus statement. Gastrointest. Endosc. 2017.03; 85(3); 639-646.e2


7. Chiaki Maeyashiki, Shigeru Oshima, Kana Otsubo, Masanori Kobayashi, Yoichi Nibe, Yu Matsuzawa, Michio Onizawa, Yasuhiro Nemoto, Takashi Nagashima, Ryuichi Okamoto, Kiichiro Tsuchiya, Tetsuya Nakamura, Mamoru Watanabe. HADHA, the alpha subunit of the mitochondrial trifunctional protein, is involved in long-chain fatty acid-induced autophagy in intestinal epithelial cells. Biochem. Biophys. Res. Commun. 2017.03; 484(3); 636-641


17. Shintaro Akiyama, Wakana Mochizuki, Yoichi Nibe, Yuka Matsumoto, Kei Sakamoto, Shigeru Oshima, Mamoru Watanabe, Tetsuya Nakamura. CCN3 Expression Marks a Sulfomucin-nonproducing Unique Subset of Colonic Goblet Cells in Mice. Acta Histochem Cytochem. 2017.12; 50(6); 159-168

[Books etc]

1. Nagaishi T, Watanabe M. Crohn’s Disease and Ulcerative Colitis: from Epidemiology and Immunobiology to a Rational Diagnostic and Therapeutic Approach. 2017.03 (ISBN : 978-3-319-33701-2)

[Misc]

1. Tetsuya Nakamura, Mamoru Watanabe. Intestinal stem cell transplantation. J. Gastroenterol. 2017.02; 52(2); 151-157


[Conference Activities & Talks]

1. Watabe T, Nagaishi T, Hosoya A, Jose N, Tokai A, Kojima Y, Adachi T, Watanabe M. The lack of secreted IgA spontaneously induces the mucosal inflammation specifically in the ileum. DDW 2017 2017.05.09 Chicago (USA)


6. Matsuoka K, Watanabe M. Recent pivotal studies for IBD in Asians: current status and future directions. AOCC2017 2017.06.16 Seoul (Korea)


8. Hosoya A, Nagaishi T, Watabe T, Tsugawa N, Jose N, Kojima Y, Adachi T, Watanabe M. Verification of immunoglobulin A protection of intestinal mucosa from microflora. AOCC2017 2017.06.16 Seoul (Korea)


Department of Sleep Modulatory Medicine

Professor: Naohiko Inase
Associate Professor: Meiy Tamaoka
Lecturer: Toshihide Fujie (Respiratory Medicine)
Technician: Takao Miyoshi, Daito Funaki

(1) Research

1. Open-label trial of hyperbaric oxygen therapy on sleep quality
2. Development of the evaluation system for the efficacy of oral appliances on obstructive sleep apnea syndrome.
3. Development of Non-contact polysomnograph system.
4. The association between OSA and short term blood-pressure variability.
5. The association between OSA and interstitial pneumonia.
6. 24 hours SpO2 monitoring for patients with chronic respiratory failure

(2) Education

Education of sleep medicine for students, residents and technicians

(3) Clinical Services & Other Works

Clinical Center for Pleasant Sleep provides a variety of medical service for sleep disorder especially for sleep apnea syndrome.

- Out-patient Clinic
  Monday: AM  Dr. Terada (Pulmonary Medicine)
  PM  Dr. Fujie (Pulmonary Medicine)
  Tuesday: AM  Dr. Hirai (Psychiatry)
  Wednesday: AM  Dr. Miyazaki (Health Service Center)
  Thursday: AM  Dr. Tamaoka (Sleep Modulatory Medicine)
  PM  Dr. Tamaoka (Sleep Modulatory Medicine)
  Friday: AM  Dr. Uezato (Psychiatry)
  AM  Dr. Tateishi (Pulmonary Medicine)
  PM  Dr. Tateishi (Pulmonary Medicine)

- Outpatient visits: 5,712 (New:323) for FY 2017
- Examination: polysomnography: 129 patients for FY 2017

(4) Clinical Performances

We aim to establish personalized medicine for OSA in collaboration with the Dental Clinic for Sleep Disorders.
(5) Publications

[Original Articles]


2. Akihito Uezato, Mitsuhiro Enomoto, Meiyo Tamaoka, Mizue Hobo, Shusuke Inukai, Masayuki Hideshima, Yasunari Miyazaki, Toru Nishikawa and Kazuyoshi Yagishita. Shorter sleep onset latency in patients undergoing hyperbaric oxygen treatment Psychiatry and Clinical Neurosciences. 2017.01; 71(1); 73-74


[Conference Activities & Talks]

1. Shota Hayashi, Masayuki Hideshima, Naoki Ishihara, Tomohiro Kurashima, Shusuke Inukai, Yuuko Mitsuma, Shuhei Nakamura, Toshihide Fujie, Yasunari Miyazaki, Meiyo Tamaoka. Conversion from continuous positive airway pressure therapy to oral appliance therapy for obstructive sleep apnea in Tokyo Medical and Dental University Hospitals. 16th the Japanese Academy of Dental Sleep Medicine 2017.11.04 Yamaguchi, Japan
Department of Translational Oncology

< Department of Translational Oncology>
Associate Professor: Megumi ISHIGURO
Associate Professor: Toshiaki ISHIKAWA (concurrent)

(1) Outline

Department of Translational Oncology aims to establish the “personalized therapy” in chemotherapy for gastrointestinal cancers through identification of the predictive factors for chemo-responsiveness and prognosis.

(2) Research

Main themes of our research activities is identification of the predictive factors for chemo-responsiveness and prognosis by using our well-organized clinical database, fresh frozen and paraffin-embedded samples, and molecular biological technique, i.e. gene expression micro array analysis, and DNA copy number analysis.

(3) Publications

[Original Articles]


[Conference Activities & Talks]


3. Hanaoka M, Ishikawa T, Ishiguro M, Tokura M, Yamauchi S, Kikuchi A, Yasuno M, Uetake H, Kawano T. ATF6, a UPR related gene, expression in malignant conversion and progression of Ulcerative colitis (UC)-associated and non-UC-associated colorectal cancer.. Society of Surgical Oncology (SSO) 2017 Annual Meeting 2017.03.16 Seattle (USA)


Clinical Laboratory

General Manager
-Professor : Shuji Tohda

Associate Manager
-Junior Associate Professor : Tadashi Kanouchi

Assistant Professor : Miyako Murakawa
Assistant Professor : Ayako Nogami
Assistant Professor : Hideki Arima
Medical Staff : Shintaro Iida

(1) Outline

The Clinical Laboratory is a central clinical department that conducts laboratory tests in order to obtain information about the diagnosis, treatment, and prevention of diseases. Physiological tests such as electrocardiogram, echocardiography, pulmonary function tests, and electroencephalogram are also performed at our facility.

(2) Research

Our research subjects are
1) New genetic tests for hematological disorders,
2) Development of tests for molecular pathology and drug sensitivity of hematological malignancies,
3) Genotypic analysis of bacteria for monitoring those transmission in the hospital,
4) Development of electrophysiological diagnostic tests for peripheral neuropathies,
5) Clinical and electrophysiological study for amyotrophic lateral sclerosis,
6) Quality control of nerve conduction study,
7) Molecular mechanisms of treatment for hepatitis C.
8) Novel methods to analyze cardiac function using echocardiography.

(3) Education

We lecture on clinical laboratory medicine and give technical training on clinical laboratory tests and physiological function tests to not only the medical students and medical technologist students in the faculty of medicine of the university but also those in the other vocational school for medical technologists. We give a labo tour and practice to master course graduate students, too. We gave a general training for clinical laboratory medicine to nine junior residents of university hospital in 2017. We also held hands-on seminars of Gram staining, urinary sediment, cardiac and abdominal ultrasonography for the residents.
Clinical Services & Other Works

Clinical laboratory bears an important responsibility for advanced and high quality medical care. Our clinical laboratory is based on the principle of providing the speedy and high quality tests. The highest level of advanced tests, such as qualitative and quantitative analysis of various viral DNA by the PCR method, are also introduced here. In the night time and holidays, the clinical laboratory provides blood products for transfusion in cooperation with the blood transfusion service of the hospital. The updated information on antibiotic sensitivity of the pathogens in each ward is also provided online regularly. Together with the division of infection control and prevention, we monitor the nosocomial transmission of bacteria such as MRSA by genotypic analysis of those. Our clinical laboratory and blood transfusion service have received accreditation of ISO15189 (Medical laboratories - Particular requirements for quality and competence) in June 2014, and renewed it with the latest version in December 2016. It means that the clinical laboratory is an international standard on quality and that our hospital is allowed to conduct the international clinical trials. We give a lecture on laboratory tests at meetings of laboratory medicine-related societies.

Clinical Performances

We are developing new diagnostic methods collaborating with various clinical departments. We are also supporting them in their diagnostic procedure.

Publications

[Original Articles]


2. Yuki Okuhashi, Mai Itoh, Shuji Tohda. Hedgehog Stimulation Suppresses Clonogenicity and Activates NOTCH Signalling in T-lymphoblastic Leukaemia Jurkat Cells. Anticancer Res.. 2017.05; 37(9); 5005-5009


7. Erika Shiratori, Mai Itoh, Shuji Tohda. MYD88 Inhibitor ST2825 Suppresses the Growth of Lymphoma and Leukaemia Cells. Anticancer Res.. 2017.11; 37(11); 6203-6209
8. Mika Ohtaka, Mai Itoh, Shuji Tohda. BMI1 Inhibitors Down-regulate NOTCH Signaling and Suppress Proliferation of Acute Leukemia Cells. Anticancer Res.. 2017.11; 37(11); 6047-6053


10. Keigo Okada, Ayako Nogami, Shinya Ishida, Hiroki Akiyama, Cheng Chen, Yoshihiro Umezawa and Osamu Miura. FLT3-ITD induces expression of Pim kinases through STAT5 to confer resistance to the PI3K/Akt pathway inhibitors on leukemic cells by enhancing the mTORC1/Mcl-1 pathway Oncotarget. 2017.12; 9: 8870-8886

[Books etc]

[Conference Activities & Talks]

2. Chihiro Tani. Gene transfer by natural genetic transformation in Moraxella catarrhalis. The 90th Annual Meeting of Japanese Society for Bacteriology 2017.03.18

3. Mika Ohtaka, Mai Itoh, and Shuji Tohda. BMI1 inhibitors suppress cell growth and NOTCH signalling of acute leukemia cells. 46th Annual Scientific Meeting of the International Society for Experimental Hematology 2017.08.26 Frankfurt, Germany


Transfusion Medicine

Director (Lecturer) Michiko KAJIWARA
Assistant Director (Medical Technologist) Naoki OHTOMO
Section Chief Medical Technologist Keiko BABA
Assistant Section Chief Medical Technologist Yukiko OHISHI
Clinical Fellow Shihoko SUWA
Medical Technologist Yukari USUI
Medical Technologist Kaori OKUYAMA
Medical Technologist Shiho KOBAYASHI (-May, 2017)
Medical Technologist Chihiro TOYAMA
Medical Technologist Eriko FURUYA
Medical Technologist Miho Yamasaki (Aug 2017 -)

(1) Research

1) Practice of safe and appropriate transfusion therapy (including prevention of medical accident related transfusion)
2) Basic and clinical research of hematopoietic stem cell transplantation

(2) Lectures & Courses

Transfusion therapy is a supplementation of the blood component, but it also has aspects of cell therapy and transplantation. So, it is important to practice safe and appropriate transfusion therapy. Clinical tests of transfusion, such as blood type test, are most basic immunological test technique. The accurate understanding and practice of these tests is also necessary for the safety of medical treatment. From this point of view, we educate the students of school of medicine, school of allied health sciences, graduate school of medical and dental sciences, medical doctors, and co-medicals.

(3) Clinical Services & Other Works

Clinical Services (The result of 2017)

1) The amount of blood products used
   Red cell component products 13,035 Units (6,596 bags)
   Platelet concentration 28,396 Units (2,538 bags)
   Fresh frozen plasma 9,349 Units (4,275 bags)
2) Autologous blood collection and transfusion
   Autologous blood collection 292 cases (390times, 766Units)
   Autologous blood transfusion 265 cases (665 Units)
3) The number of clinical tests of transfusion
   Blood typing 10,810
   Anti red blood cell antibody test 5,393
   Cross match 10,258
4) Hematopoietic stem cell harvest
Central Clinical Facilities

- Autologous peripheral blood stem cell harvest: 13 cases, 13 times
- Allogenic peripheral blood stem cell harvest: 2 cases, 3 times
- Allogenic bone marrow harvest: 14 cases, 14 times

(Including Japan Marrow Donor Program donors)

5) Hematopoietic stem cell transplantation
(The evaluation and preservation of the stem cells were done in our department)

- Autologous peripheral blood stem cell transplantation: 8 cases, 8 times
- Allogenic peripheral blood stem cell transplantation: 2 cases, 2 times
- Allogenic bone marrow transplantation: 18 cases, 18 times
- Allogenic umbilical cord blood transplantation: 2 cases, 2 times

(4) Publications

[Original Articles]

1. Masatoshi Takagi, Yasuyoshi Ishiwata, Yuki Aoki, Satoshi Miyamoto, Akihiro Hoshino, Kazuaki Matsumoto, Akira Nishimura, Mari Tanaka, Masakatsu Yanagimachi, Noriko Mitsui, Kohsuke Imai, Hirokazu Kanehane, Michiko Kajiwara, Kanako Takikawa, Tsukasa Mae, Osamu Tomita, Junya Fujimura, Masato Yashara, Daisuke Tomizawa, Shuki Mizutani, Tomohiro Morio. HLA haploidentical hematopoietic cell transplantation using clofarabine and busulfan for refractory pediatric hematological malignancy. Int J Hematol. 2017.05; 105(5); 686-691


[Conference Activities & Talks]

1. Ryoto Yoshimoto, Ken Watanabe, Emi Uchida, Shihoko Suwa, Shuji Tohda, Masahiko Hatano, Miura Osamu, Tetsuya Fukuda. IVNSIABP/Ndi1 is highly expressed in refractory lymphoma as a novel therapeutic target molecule. The 79th Annual Meeting of the Japanese Society of Hematology 2017.10.20 Tokyo

2. Central venous catheter-related cylindrical thrombosis in right atrium after bone marrow transplantation for X-linked anhidrotic ectodermal dysplasia with immunodeficiency (XL-EDA-ID). 2017.11.09

3. A 7-year-old girl who maintains complete remission after multiple hematopoietic cell transplantation for frequent relapse. 2017.11.11
Center for Cell Therapy

Director: Tomohiro Morio (Dpt. of Pediatrics and Developmental Biology)
Vise Director: Ichiro Sekiya (Center for Stem Cell and Regenerative Medicine)
Quality control manager: Norio Shimizu (Center for Stem Cell and Regenerative Medicine)
Product manager: Michiko Kajiwara (Department of Blood Transfusion Medicine)
Technicians: Ayako Tsuji, Minhua Sun (to January 2017), Yuri Kohno
Technicians (From Collaborative Research): Takafumi Kato, Megumi Muraoka, Hiroaki Mori, Hiroshi Terakawa
Clerical Assistant: Akiko Hoshikawa, Jun Kusano

(1) Research

1. Development of innovative techniques for quality assurance of cell products
2. Development of a novel measure for rapid and sensitive detection of multiple pathogens
3. Development of multi-virus specific T lymphocytes for adoptive immunotherapy (Department of Pediatrics and Developmental Biology)
4. Research on a regeneration system of the cartilage bone from the synovial membrane (Department of Orthopedic Surgery)
5. Development of novel peptide-pulsed dendritic therapy for adult T-cell leukemia (Department of Immunotherapeutics / Department of Hematology)

We are planning to start multi-virus specific T cell therapy for opportunistic viral infection post hematopoietic cell transplantation and expanded colon epithelium for various bowel disorders following approval from the certified committee for regenerative medicine and from MHLW.

(2) Education

We provide assistance to prepare standard operation procedure (SOP) and offer on-the-job training for cell processing/manipulating procedures and that for quality assurance at the center. Facility for the education and training was recently installed at the CPC annex.

(3) Clinical Services & Other Works

The cell products currently prepared in our center include
#1 Synovium-derived mesenchymal stem cells
#2 Processed peripheral blood stem cells

(4) Clinical Performances

Our center in TMDU Medical Hospital was renovated and re-started operation as of March 2015. We have five independent cell processing rooms (class 10,000 clean rooms). All the rooms are equipped with a bio-safety
cabinet. The hardware as well as software used in our center fulfills all the guidelines that are required for the preparation of cell products of clinical grade.

### (5) Publications

#### [Original Articles]


16. Katagiri Kenta, Yu Matsukura, Takeshi Muneta, Nobutake Ozeki, Mitsuru Mizuno, Hisako Katano, Ichiro Sekiya. Fibrous synovium releases higher numbers of mesenchymal stem cells than adipose synovium in a suspended synovium culture model. Arthroscopy. 2017.04; 33(4); 800-810


18. Haruna Yokoyama, Shimpei Baba, Jun Oyama, Kengo Moriyama, Tomohiro Morio. Early hypoperfusion on arterial spin labeling may be a diagnostic marker for acute encephalopathy with biphasic seizures and late reduced diffusion. Brain Dev.. 2017.05; 39(8); 722

19. Mikio Shioda, Takeshi Muneta, Kunikazu Tsuji, Mitsuru Mizuno, Keiichiro Komori, Hideyuki Koga, Ichiro Sekiya. TNF α promotes proliferation of human synovial MSCs while maintaining chondrogenic potential. PLoS ONE. 2017.05; 12(5); e0177771


21. Masatoshi Takagi, Yasuyoshi Ishiwata, Yuki Aoki, Satoshi Miyamoto, Akihiro Hoshino, Kazuaki Matsumoto, Akira Nishimura, Mari Tanaka, Masakatsu Yanagimachi, Noriko Mitsuki, Kohsuke Imai, Hirokazu Kanegane, Michiko Kajiwara, Mari Tanaka, Hideyuki Koga, Tsukasa Mae, Osamu Tomita, Jyunya Fujimura, Masato Yashuara, Daisuke Tomizawa, Shuki Mizutani, Tomohiro Morio. HLA haploidentical hematopoietic cell transplantation using clofarabine and busulfan for refractory pediatric hematological malignancy. Int J Hematol. 2017.05; 105(5); 686-691


24. Yuji Kohno, Mitsuru Mizuno, Nobutake Ozeki, Hisako Katano, Keiichiro Komori, Shizuka Fujii, Koji Otabe, Masafumi Horie, Hideyuki Koga, Kunikazu Tsuji, Mikio Matsumoto, Haruka Kaneko, Yuji Takazawa, Takeshi Muneta, Ichiro Sekiya. Yields and chondrogenic potential of primary synovial meniscal stem cells are comparable between rheumatoid arthritis and osteoarthritis patients. Stem Cell Res Ther. 2017.05; 8(1); 115

Haploinsufficiency of TNFAIP3 (A20) by germline mutation is involved in autoimmune lymphoproliferative syndrome. J. Allergy Clin. Immunol.. 2017.06; 139(6); 1914-1922


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34. Hirokazu Kanegane, Akihiro Hoshino, Tsubasa Okano, Takahiro Yasaki, Taizo Wada, Hidetoshi Takada, Satoshi Okada, Motoi Yamashita, Tzu-Wen Yeh, Ryuta Nishikomori, Masatoshi Takagi, Kohsuke Imai, Hans D Ochs, Tomohiro Morio. Flow cytometry-based diagnosis of primary immunodeficiency diseases Allergol Int. 2017.06;


36. Eriko Grace Suto, Yo Mabuchi, Nobuharu Suzuki, Koji Suzuki, Yusuke Ogata, Miyu Taguchi, Takeshi Muneta, Ichiro Sekiya, Chihiro Akazawa. Prospectively isolated mesenchymal stem/stromal cells are enriched in the CD73(+ ) population and exhibit efficacy after transplantation. Sci Rep. 2017.07; 7(1); 4838

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40. Johanna Schepp, Janet Chou, Andrea Skrabl-Baumgartner, Peter D Arkwright, Karin R Engelhardt, Sophie Hambleton, Tomohiro Morio, Ekkehard Röther, Klaus Warnatz, Raif Geha, Bodo Grimbacher. 14 Years after Discovery: Clinical Follow-up on 15 Patients with Inducible Co-Stimulator Deficiency. Front Immunol. 2017.08; 8: 964


42. Hideyuki Koga, Toshifumi Watanabe, Masafumi Horie, Hiroki Katagiri, Koji Otabe, Toshiyuki Ohara, Mai Katakura, Ichiro Sekiya, Takeshi Muneta. Augmentation of the pullout repair of a medialmeniscus posterior root tear by arthroscopic centralization 2017.08; 6(4); 1335-1339


45. Tomohiro Yabushita, Satoshi Yoshioka, Yusuke Koba, Yuichirou Ono, Nobuhiro Hiramoto, Sumie Tabata, Munehiro Itou, Norio Shimizu, Keisuke Tomii, Takayuki Ishikawa. Successful Treatment of Herpes Simplex Virus (HSV)-1-associated Hemophagocytic Lymphohistiocytosis (HLH) with Acyclovir: A Case Report and Literature Review Blood. 2017.09; 130(12); 1456-1467

46. Ichiro Sekiya, Darwin J Prockop.. Beginning of an Unresolved Debate:Should Mesenchymal Stem Cells Be Expanded at Low Density to Preserve Early Progenitors? STEM CELLS 35Anniversary. 2017.09; 1; 36-37

47. Akira Endo, Miko Okamura, Shunsuke Yoshikawa, Yasuhiro Otomo, Tomohiro Morio. Multilateral Functional Alterations of Human Neutrophils in Sepsis: From the Point of Diagnosis to the Seventh Day. Shock. 2017.10;


58. Ryuichi Nakagawa, Kei Takasawa, Tzu-Wen Yeh, Kohsuke Imai, Kenichi Kashimada, Tomohiro Morio. Type 1 Diabetes Mellitus Associated with Activated Phosphoinositide-3-kinase Delta Syndrome, Type 2. J Diabetes. 2017.12;


62. Masayuki Nagasawa, Noriko Mitsuki, Yuki Aoki, Toshiaki Ono, Takeshi Isoda, Kohsuke Imai, Masatoshi Takagi, Michiko Kajiwara, Hirokazu Kanegane, Tomohiro Morio. Effect of reduced-intensity conditioning and the risk of late-onset non-infectious pulmonary complications in pediatric patients Eur. J. Haematol. 2017.12; 99(6); 525-531

[Misc]


2. Tomohiro Morio. Recent advances in the study of immunodeficiency and DNA damage response. Int. J. Hematol. 2017.10

3. Risa Nomura, Kentaro Miyai, Gen Nishimura, Kenichi Kashimada, Tomohiro Morio. Myhre syndrome: Age-dependent progressive phenotype Pediatr Int. 2017.11; 59(11); 1205-1206

[Conference Activities & Talks]

1. Ichiro Sekiya. Preclinical and Clinical Studies of Meniscus Regeneration by Synovial Stem Cells. Orthopaedic Research Society 2017 Annual Meeting 2017.03.19 SanDiego, USA

2. Naoto Watanabe, Mitsuru Mizuno, Jumpei Matsuda, Hisako Katano, Nobutake Ozeki, Koji Otabe, Keiichiro Komori, Yuji Kono, Kenta Katagiri, Takeshi Muneta, Ichiro Sekiya.. Decellularization of the meniscus by high hydrostatic pressure: temperature condition for removal of cell debris.. Orthopaedic Research Society 2017 Annual Meeting 2017.03.20 SanDiego, USA

3. Mana Naritomi, Mitsuru Mizuno, Hisako Katano, Koji Otabe, Keiichiro Komori, Shizuka Fujii, Nobutake Ozeki, Masafumi Horie, Kunikazu Tsuji, Takeshi Muneta, Ichiro Sekiya.. Recombinant peptide petaloid pieces enhance in vitro cartilage formation of mesenchymal stem cells. Orthopaedic Research Society 2017 Annual Meeting 2017.03.20 SanDiego, USA


6. Kenta Katagiri, Mitsuru Mizuno, Hideyuki Koga, Nobutake Ozeki, Yusuke Nakagawa, Yuji Kono, Koji Otabe, Masafumi Horie, Hisako Katano, Kunikazu Tsuji, Hideo Ono, Takeshi Muneta, Ichiro Sekiya.. Transplantation of Synovial Mesenchymal Stem Cells Enhances the Effect of Centralization with Suture Anchor and Promotes Meniscus Regeneration for Extruded Meniscus After Partial Meniscectomy in Microminipigs. Orthopaedic Research Society 2017 Annual Meeting 2017.03.22 SanDiego, USA

7. Yuji Kono, Mitsuru Mizuno, Kenta Katagiri, Koji Otabe, Nobutake Ozeki, Hisako Katao, Keiichiro Komori, Masafumi Horie, Kunikazu Tsuji, Mikio Matsumoto, Haruka Kaeo, Yuji Takazawa, Takeshi Muneta, Ichiro Sekiya.. Harvested cell number varies greater in RA than in OA after a suspended synovium culture. Orthopaedic Research Society 2017 Annual Meeting 2017.03.22 SanDiego, USA

8. Cell and Gene Therapy for Hematological Disorders. The 8th JSH International Symposium 2017 2017.05.01 Miyazaki, Japan

10. Ono S, Yanagimachi M, Okano T, Hoshino A, Takagi M, Imai K, Morio T, Kanegane H. Inflammatory Bowel Disease Associated with XIAP Deficiency can be cured by Hematopoietic Stem Cell Transplantation. ESID 2017 2017.09.12 Edinburgh, UK


15. Morio T. Investigation of Genetic Analysis for Primary Immunodeficiency Diseases. Asia Pacific Society for Immunodeficiencies(APSID) 2017.10.10 Hong Kong

16. Morio T. Hematopoietic Cell Transplantation for Primary Immunodeficiency Diseases.: Current Situation and Future Direction. Asia Pacific Society for Immunodeficiencies(APSID) 2017.10.10 Hong Kong


18. Central venous catheter-related cylindrical thrombosis in right atrium after bone marrow transplantation for X-linked anhidrotic ectodermal dysplasia with immunodeficiency (XL-EDA-ID). 2017.11.09

19. Central venous catheter-related cylindrical thrombosis in right atrium after bone marrow transplantation for X-linked anhidrotic ectodermal dysplasia with immunodeficiency (XL-EDA-ID). 2017.11.09

20. A case of T-cell lymphoblastic lymphoma/leukemia complicated by gait inability during combination chemotherapy with nelarabine. 2017.11.10

21. A 7-year-old girl who maintains complete remission after multiple hematopoietic cell transplantation for frequent relapse. 2017.11.11

22. A 7-year-old girl who maintain complete remission after multiple hematopoietic cell transplantation for frequent relapse of infant leukemia. 2017.11.11


[Patents]
1. METHOD FOR DETECTING MYCOPLASMA, Announcement Number : 3192878

[Awards & Honors]
1. Yusuke Nakagawa, Best Poster Presentation Award, Japanese Medical Society of America,Japan Society for the Promotion of Science, 2017.04
Cleanroom

Associate Professor SUNAKAWA Mitsuhiro
Assistant Professor MATSUMOTO Hiroyuki

(1) Research

1) The development of disposable hygienic materials for dental use.
2) The survey for the oral diseases in patients with HIV.
3) The survey for the relationship between the consciousness of the staff and students and the needle stick accident in the hospital.

(2) Education

The improvement of the nosocomial infection control system in the University Hospital, Faculty of Dentistry, Tokyo Medical and Dental University and the education of the actual infection control method to all staff and clinical course students.

(3) Publications
Center for Development of Devices and Drugs in Dentistry

Director Junji TAGAMI
Co-Director Hidekazu TAKAHASHI
Hideki HARASAWA
Naoko HARADA
Member Miwako WAGAI (CRC)
Kazuko KOJIMA (CRC)

(1) Outline

Center for development of devices and drugs in dentistry was established in April, 2004 and is committed to a wide range of activities, such as education, consultation for new devices and drugs application, and support for clinical trials in University Hospital of Dentistry.

(2) Education

We provide a program for the 3rd year students of the School of Dentistry, also for the 2nd year students of the School of Oral Health Care Sciences majoring in Oral Health Engineering to help them to gain fundamental knowledge of Pharmaceutical Affairs Act which is required for development and application of dental devices. Collaborating with the Institute of Biomaterials and Bioengineering, we lecture the 1st year students in Master’s Program at Graduate School of Medical and Dental Sciences on issues and systems related to the mission that many outcomes from studies about innovative dental devices and materials will be put into use without “device-lag”.

(3) Clinical Services & Other Works

1. Clinical trial supporting Services
In order to accomplish clinical trials successfully, we manage and support from planning, paper work to patient care as a main office of clinical trials in University Hospital of Dentistry.

2. Consultation Services
We provide consultation services about various issues concerning the Pharmaceutical Affairs Act, not only for pharmaceutical and dental companies but also for dentists and researchers in our University. By the supporting services of clinical trials, we hope that applicant will be able to form a protocol adequately and effectively, and to start the clinical trial swiftly.

(4) Clinical Performances

Consultation achievements
We managed and supported one clinical trial for dental device in 2017.
The 37 consultation services concerning dental devices were performed in 2017.

(5) Publications

[Original Articles]

1. Sasipin Lauvahutanon, Maho Shiozawa, Hidekazu Takahashi, Naohiko Iwasaki, Meiko Oki, Werner J. Finger, Mansuang Arksornmikut. Discoloration of various CAD/CAM blocks after immersion in coffee. Restorative Dentistry and Endodontics. 2017.01; 42(1); 9-18


3. Kento Sato, Keiichi Hosaka, Masahiro Takahashi, Masaomi Ikeda, Fucong Tian, Wataru Komada, Masatoshi Nakajima, Richard Foxton, Yoshihiro Nishitani, David H Pashley, Junji Tagami. Dentin Bonding Dura-


11. Saad A, Inoue G, Nikiido T, Ikeda M, MF Burrow, Tagami J. Microtensile Bond Strength of Resin-

12. Survey on the actual situation of oral antibiotics prescription for extraction and treatment other than extraction 2017.12; 36(3); 95-100


[Books etc]

1. Ken-ichi Tonami, Shizuko Ichinose, Kazunobu Sano, Naohiko Iwasaki, Hidekazu Takahashi, Shiro Mataki, Kouji Araki. Analysis of the dentin surface after Xe excimer lamp irradiation. The 95th General Session & Exhibition of the IADR 2017.03.22 San Francisco

2. Alireza Sadr, Juri Hayashi, Yasushi Shimada, Junji Tagami. Effects of Fiber Reinforcement on Composite Adaptation in Deep Cavities. 95th General Session & Exhibition of the IADR 2017.03.22

3. Juri Hayashi, Alireza Sadr, Tomohiro Takagaki, Tomoko Numata, Yasushi Shimada, Junji Tagami, Yasunori Sumi. 3D assessment of Bulk-fill Composites Gap Formation and Polymerization Shrinkage. 95th General Session & Exhibition of the IADR 2017.03.22

4. Amr SAAD, Go Inoue, Junji Atomura, Toru Nikaido, Junji Tagami. μ TBS of RM-GIC on demineralized root dentin with several conditioners. 95th General session & exhibition of the IADR 2017.03.22

5. Noda S, Kawashima N, Hashimoto K, Yamamoto M, Aramaki O, Tagami J, Okiji T. Effects of culture density on stem cell properties of human dental pulp stem cells. 2017.06.08


7. Junji Tagami. About composite resin restoration. 2017.06.21 Showa University


10. Junji Tagami. Direct bonding strategies in various clinical situations. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.30

11. Meet-the-Expert(Dental materials):Dental materials. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.31

12. Junji Tagami. Is bulkfill composite reliable?. IFEMA, Feria de Madrid, FDI Annual World Dental Congress 2017.08.31

13. Dhaifallah Alqarni, Keiichi Hosaka, Teerapong Mamanee, Masatoshi Nakajima, Masaomi Ikeda, Junji Tagami. Effect of different surface treatments on repair uTBS of composite bonded to resin matrix after water exposure. The 10th World Congress of International Federation of Esthetic Dentistry 2017.09.14 Toyama


22. Shin Rozan, Rena Takahashi, Toru Nikaido, Junji Tagami. The effect of resin coating technique on dentin bond strength and internal adaptation of CAD/CAM-fabricated inlays. The 147th Meeting of the Japanese Society of Conservative Dentistry 2017.10.27 Iwate, Japan

23. Ali Alqahtani, Go Inoue, Toru Nikaido, Junji Tagami. Effect of concentrations of potassium and sodium fluoride on micro-shear bond strength and inhibition of demineralization. 147st Hozon Gakkai 2017.10.27


27. Hidekazu TAKAHASHI, Naohiko IWASAKI, Tetsuya SUZUKI. FLEXURAL PROPERTIES OF RECENT COMPOSITE RESIN BLOCKS FOR CAD/CAM. 3rd ANNUAL MEETING of the IADDM 2017.12.09 Berlin, Germany

28. The evaluation of bond strength of calcium containing adhesive system to artificial demineralized dentin.

29. Toothbrushing timing after acidic drinks affects enamel loss in-situ. Boston, USA

[Awards & Honors]

1. Wilmer Souder Award, The International Association for Dental Research, 2017.03