Section of Oral Pathology

1. Staff and Students

Professor Akira YAMAGUCHI
Associate Professor (GCOE) Tadahiro Iimura
Lecturer Ken-ichi Katsube
Assistant Professor Kei Sakamoto
Tokunin Assistant Professor Yoshihiro Tamamura
Technician Miwako Hamagaki
Graduate Students
Ph.D. Course Kou Kayamori Shouichi Nakanishi
Lei Cao Tadanobu Aragaki (Maxillofacial Surgery)
Tasutku Kihara (Maxillofacial Surgery)
Kousuke Umehara (Removable Partial Denture Prosthodontics)
Tsutomu Matsumoto (Maxillofacial Orthognathics)
Yumi Terachi (Periodontology)
Akiko Himeno (Periodontology)
Ichiro Kadouchi (Orthopedic Surgery, Jichi Medical University)
MS Course Saki Ichikawa
Research Student Masafumi Ishikuro Masaya Eto
Zhao Xin
Secretary Noriko Yoshida

2. Purpose of Education

Oral Pathology section lectures the Module “Pathology” to 3rd grade students. This Module is comprised of two categories; General Pathology and Oral Pathology. Main objective of General Pathology is to provide students various opportunities and knowledge about general aspects of various diseases. Oral Pathology provides details of pathogenesis, pathophysiology and histopathological characteristics in various oral diseases.

3. Research Subjects

1) Clinico-patological research on oral and maxillofacial regions
2) Molecular mechanism of bone formation and bone regeneration
3) Roles of Notch signaling in skeletal formation and regeneration
4) Molecular mechanism of bone destruction by oral cancers
5) Evolutional changes in skeletal formation

4. Clinical Services

Our Dental Hospital has over 2,000 biopsy cases a year. Oral Pathology Section is involved in histopathological diagnosis of these biopsy cases.

5. Publications


Molecular Cellular Oncology and Microbiology

1. Staffs and Students (April 2008)

Associate Professor Takuma NAKAJIMA
Junior Associate Professor Kenji YAMATO
Assistant Professor Noritaka KAGAYA
Graduate Student Shinji ENDOH

2. Purpose of Education

Wide diversity of microbial residents in oral cavity including multiple sorts of pathogenic organisms shares the greatest population in our body. The oral cavity is also a major entrance for systemic pathogens such as bacteria and viruses and in addition, the surgical treatments of oral cavity can mediate the blood-transmitting infections. Concurrently, the major subjects for dentists including periodontal diseases and dental caries are caused by microbial infections. Resent research revealed that some oral infections contribute to triggering and deterioration of systemic disorders. Accordingly, dentists should be responsible for both patients and themselves to protect them from pathogenic infections. The education of Microbiology is, therefore the most essential subject for dentistry.

As a responsible department of education and research for basics of microbiology and host cell responses, all of our subjects are based on analyses of molecular cellular and biochemical mechanisms of the interaction between pathogen and host cell responses. The education for graduate students of our department is therefore giving knowledge for concrete approaches and techniques to elucidate both the molecular basics of the pathogenic mechanisms and the novel applications for treatment and/or diagnosis of infectious/oncogenic diseases. Our department participates in the education module “Infection and Immunity” for 3rd degree of undergraduate students of dentistry and share lectures and students’ lab. to educate general pathogenic microbiology including oral microbiology.

3. Research Subjects

1) Functional analyses for novel cell detaching factor, Forsythia detaching factor (FDF) from Periodontopathic bacterium Tannerella forsythia
2) Analyses for regulatory mechanisms of cellular integrity through formative control of promyelocytic leukemia-nuclear bodies (PML-NBs)
4) Mechanism of green tea catechin-induced apoptosis in oral cancer cells.
5) Research on the function of novel ERK2 binding proteins.

4. Publications

Original articles

7. Mahalingam M, Arvind R, Ida H, Murugan AK, Yamaguchi M and Tsuchida N. ERK2 CD domain mutation from a human cancer cell line enhanced anchorage-independent cell growth and abnormality in Drosophila. Oncology Reports,
Oral Restitution

Molecular Immunology

1. Staffs and Students (April, 2008)

Professor  Miyuki AZUMA
Assistant Professor  Masaaki HASHIGUCHI
Adjunct instructor  Hiroshi KIYONO  Fumihiko TSUSHIMA
Graduate Student  Jinhua PIAO
Yosuke KAMIMURA  Hiroko KOBORI
Narumon CHALERMSARP  Yujia CAO
Takeshi KINEBUCHI  Oto ARAMAKI (Cariology and Operative Dentistry)
Secretary  Hatsue TADANO

2. 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. Research Subjects

1) Roles of B7-CD28 and TNF-TNFR family costimulatory molecules
2) Lymphocyte functional molecules expressed on T cells and dendritic cells
3) Immune regulation by targeting costimulatory molecules
4) Dental and oral immunobiology
5) Immunoenhancing effects by phytochemicals

4. Publications

Original Article

8. Chalermsarp N, Azuma M. Identification of three distinct subsets of migrating dendritic cells from oral mucosa within the regional lymph nodes. Immunology (on line publication 2008 DOI: 10.1111/j.1365-2567.2008.03031.x)
Oral Radiation Oncology

1. Staffs and Students (April 2008)

Professor Masahiko MIURA
Tokunin Assistant Professor Satoko AOKI, Shigehiro ABE, Yoko MORI
Graduate Students (Doctor) Haruna KANEKO, Kaori IGARASHI, Mayuko Ishikawa
(Master) Kazuma FUKUDA
Research Associate Keisuke OHTA, Masahiro ISHIMA

2. Purpose of 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 opportunity 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.

3. Research Subjects

1) Signal transduction of insulin-like growth factor I (IGF-I) receptor
2) Tumor radiosensitization and antiangiogenic mechanism by sulfoglycolipids
3) Visualization of radioresponse by molecular imaging
4) Radiotherapy for oral cancer

4. Clinical Services

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.

5. Publications

Original article
Oral and Maxillofacial Surgery

1. Staffs and Students (April, 2008)
Professor
Ken OMURA

Junior Associate Professor
Hiroyuki HARADA, Yusuke NAKAJIMA

Tokunin Junior Associate Professor
Daisuke ITO

Assistant Professor
Minoru IKUTA, Keiichi MORITA,
Yuji KABASAWA, Hiroaki SHIMAMOTO,
Eriko MARUKAWA, Hidetaka MIYAZAKI,
Masaru SATO

Graduate Student
Kathawut TACHASUTTIRUT,
Ayako NEGISHI, Nami KOIDA,
Hideaki HIRAI, Yusuke HIGUCHI,
Yuri KURIBAYASHI, Chanwit PRAPINJUMRUNE,
Yasuko HANABATA, Atsushi UESUGI,
Kenji INOMATA, Kanako MATSUMOTO,
Takuma KUGIMOTO, Kiyoshi SATO,
Yukinobu TAKAHASHI, Mitsuhiro YOSHIMOTO

2. 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.

3. 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 early detection of oral cancer by mouth washing.
5) Clinical study on skeletal and dental changes after distraction osteogenesis in patients with cleft lip and palate.
6) Clinical study on maxillomandibular skeletal and dental changes after orthognatic surgery.
7) Study on neurosensory disturbances using the heat flux technique.
8) Clinical study on pre-surgical nasoalveolar molding in patients with cleft lip and palate.
9) Clinical study on alveolar bone grafting with segmental osteotomy.
10) Multidisciplinary treatment of temporomandibular disorders.
11) Clinical and experimental studies on bone regeneration using β-TCP and/or platelet rich plasma.

4. Clinical Services
The Oral and Maxillofacial Surgery Clinic examines yearly more than 5000 new patients with various diseases arising in oral and maxillofacial regions. The clinic has diplomat 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.

5. Publications
Original Article


Oral and Maxillofacial Radiology

1. Staffs and Students (April, 2008)

Professor          Tohru KURABAYASHI
Junior Associate Professor Mizue IDA, Naoto OHBAYASHI,
                    Norio YOSHINO
Assistant Professor  Akemi TETSUMURA, Shin NAKAMURA,
                    Hiroshi WATANABE, Kiyoshi OKOCHI
Hospital Staff      Ami KURIBAYASHI, Akiko IMAIZUMI
Secretary           Izumi MOTOHASHI
Graduate Student    Mohammad Abdul MOMIN, Mustafa Alkhader,
                    Yoshikazu NOMURA

2. Purpose of Education

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. Research Subjects

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.

4. Clinical Services

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.

5. Publications

Original Article

Anesthesiology and Clinical physiology

1. Staffs and Students (April, 2008)

**Professor** Mashiro UMINO

**Associate Professor** Hikaru KOHASE

**Junior Associate Professor** Shigeharu JINNO

**Assistant Professor** Fumihiro YOSHIKAWA, Tomoyuki MIYAMOTO, Ryo WAKITA

**Hospital Staff**
- Yuhko IKUSAWA, Kae SHIMOMACHI
- Aya YOSHINO, Yuka OHNO
- Saori OHGAMI, Keiko OGATA
- Hitomi KUNIMORI, Youhei FUKUMORI
- Tatsuo SANADA, Shizuka HAYASHI
- Tomoka Mastumura

**Secretary** Kanae TANIMURA

**Graduate Student** Kenzou MAKINO, Kiyoshi KAMIYA, Yukiko BABA, Haruka HAIDA

**Research Student** Toshio MASUDA, Yoko SHIRAISHI, Katsunori MOTOHASHI, Nobuyuki KONDOU, Yoko IKEDA, Hiromi IZUMIKAWA, Wakako SUMIMOTO, Kunio AISAKI

2. Purpose of Education

Main objective of Anesthesiology and Clinical Physiology in the graduate course is to provide students inevitable knowledge and skills of general and local anesthesia, management of medically complicated patients in dental clinical setting and oro-facial pain treatment. The subjects including general anesthesia, local dental anesthesia, sedation methods, CPR training are scheduled in the 5th grade students. The Students can learn respiratory and cardiovascular physiology, nature of genera anesthetics, local anesthetics, intravenous anesthetics, muscle reluctant agents. As Psyco- sedation was frequently used in dental clinical setting, the students can learn and acquire the theory and technical aspects of sedation. The students can learn the pharmacological and complicated aspects of local anesthetics and practice how to handle the local anesthesia including the conduction block and infiltration anesthesia in oral region. The students can learn the theory of CPR and AHA CPR guidelines, and practice and acquire the BLS, ACLS sequence.

3. Research Subjects

1) Develop of non-invasive drug delivery system
2) Elucidation of relationships between noxious stimulation and autonomic nervous systems
3) Elucidation of cause of neuropathic pain and develop of its' treatments
4) Elucidation of mechanism of diffuse noxious inhibitory controls
5) Clinical research of psyco-sedation and systemic management in dental clinical setting.

4. Clinical Services

Anesthesiology and clinical physiology provide general anesthesia and sedation for oral maxillofacial surgery, management of medically complicated patients with psycho-sedation, daycare general anesthesia for handicapped patients, emergency treatment in dental hospital, and non invasive local anesthesia.

5. Publications

**Original Article**


Oral Restitution


Review Article

Book
Orofacial Pain Management

1. Staffs and Students (April, 2008)
   Professor Masahiko SHIMADA
   Assistant Professor Yoko YAMAZAKI
   Hospital Staff Tomoko TAKAHASHI Yuko ANDOH
   Graduate Student Daisuke TOMIZAWA

2. Purpose and Education
   Orofacial Pain Management is a branch of dental science which deals with dental anesthesiology. Main objective of orofacial pain management in the graduate course is to provide students opportunity to study the pain, abnormal sensation, sensory paralysis, abnormal movement and motor paralysis in the orofacial area and the treatment for the patients of orofacial pain.

3. Research Subjects
   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

4. Clinical Services
   Orofacial Pain Clinic is concerned with the pain, abnormal sensation, sensory paralysis, abnormal movement and motor paralysis. Management of orofacial pain clinic is pharmacotherapy, nerve block, stimulation of the peripheral nerves including acupuncture and psychotherapies.

5. Publication
   Original Article
Diagnostic Oral Pathology

1. Staffs and Students (Apr. 2008)
Associate Professor  Norihiko OKADA
Hospital Staff  Mai NISIOKA  Yuuichi YAMADA
              Kiyoko NAGUMO  Kana IIDA
              Hiroe Kobayasi  Akino INOUE
Graduate Student  Shigeo KAWAI

2. Purpose of Education:
Diagnostic Oral Pathology is functioning as a central clinical laboratory for clinical examination in the dental hospital, which deals with hematological, biochemical, bacteriological, pathological samples, and human blood for autologous transfusion. The purpose of education is teaching the undergraduate students in the dental school the clinicopathological, pathological problems and techniques for diagnoses. Main objects of education to the graduate students in the diagnostic oral pathology are provide them opportunities to study advanced diagnostic skills for their studies. For example, immunohistochemical, and electronmicroscopic techniques for pathological research, hematology, and immunology are also involved. Another purpose of education is training young pathological doctors to get enough skills to make a diagnosis of the many biopsy cases and operation materials.

3. Research Subjects:
   1. Clinicopathological and pathological studies of the neoplasms in the oro-facial regions.
   2. Clinico-bacteriological analyses of the infectious disease in the orofacial regions.
   3. Immunological and pathological studies of the various oral mucous membrane diseases.

4. Clinical Services:
Diagnostic Oral Pathology provides the results of hematological (43,620 items in 2008), biochemical and immunochemical (206,833 items in 2008), and pathological examinations (2,433 samples in 2008) clinically, and these results of the examinations may contribute to medical and dental treatments for the patients.

5. Publications:
Original Article

Case Report
Developmental Oral Health Sciences

1. Staffs and Students (April, 2008)

Professor Yuzo TAKAGI
Junior Associate Professor Yoshiaki ONO, Zenzo MIWA
Assistant Professor Yoshiaki HASHIMOTO, Michiyo MIYASHIN,
Haruko FUJITA, Mizuho MOTEGI
Hospital Staff Ori ITO, Jyunko TSUKAMOTO,
Naho ISHIBASHI, Kyoko KIKUCHI,
Satoko KAKINO
Secretary Toshiko HIROSE
Graduate Student Yukiko SHINDO, Sriarj WANTIDA,
Naoto YANO, Yuki IMAMURA,
Kanae WADA, Mohammad Naser AHAMMED,
Yuriko IWABUCHI, Akira OHIRA,
Naoko UEHARA, Sun MEINA,
Isidro Sharon YAMBAO, Natsumi TSUCHIHASHI,
Yukie NAKAJIMA

2. Purpose of Education

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. 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.

3. 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 the new materials for endodontic treatment of deciduous and immature permanent teeth
5) Basic research on clinical pediatric dentistry

4. Clinical Services

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

5. Publication

Original Article


Orthodontic Science

1. Staffs and Students

Professor Kunimichi Soma (-March)
Associate Professor Masatake Hisano (-March)
Junior Associate Professor Yoshiro Matsumoto, Eiji Fukuyama,
Zuisei Kanno (April-)
Assistant Professor Zuisei Kanno (-April), Sawa Kaneko,
Mariko Horiuchi, Tadachika Yabusita,
Jun Hosomichi, Ippei Watari (April-)
Graduate Student Yuji Ishida (-March), Miho Ozaki (-March),
Maki Takei(-March), Hu Fang-Wei (-March),
Termsuknirandorn Saewadee (-March),
Chang siripun Chidsanu, Takayoshi Ishida,
Hiroko Ohmori, Naoki Shibutani,
Wattanachai Tanapan, Jung Hang Sul,
Rina Katayama, Emi Sakou,
Mai Shibata, Abbasy Mona Aly Abd-Ellatif,
Koji Honda, Yukiko Kuroda,
Satomi Naitou, Yasuhir0 Shimizu,
Yumi Arai (April-), Risa Usami (April-),
Chiho Katou (April-), Ikuko Kure (April-),
Maya Hiranuma (April-), Mariko Mizumachi (April-)

2. Purpose of Education

Orthodontics 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.

Subjects of Education:

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.

3. 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
4. Clinical Service

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 \textit{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 \textit{Super-Elastic Ti-Ni Alloy Wire}, and following \textit{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.

With the cooperation of related field, we also 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.

5. Publications.

1. Staffs and Students (April, 2008)

Professor: Junji Tagami
Associate Professor: Masayuki Otsuki
Junior Associate Professor: Toru Nikaido, Masatoshi Nakajima
Assistant Professor: Takako Yoshikawa, Yasushi Shimada, Yuichi Kitasako, Ryuzo Kishikawa, Nanako Iwamoto, Go Inoue, Eitetsu Cho
Tokunin Assistant Professor: Khairul Matin
Hospital Staff: Keiichi Hosaka, Tomohiro Takagaki, Meu Ariyoshi, Takehiro Takaoka
Technical assistant: Alireza Sadr, Maan M Nayif
Secretary: Shiori Ogi, Tomoko Okura
Foreign Researcher: Yi-Ling Tsai
Research Student: Shinji Ogura, Mineo Kijima, Yuka Takano, Kaoruko Tanaka, Toshiaki Hirano, Shigeyuki Nagai, Tomomasa Nomura, Hiroshi Sato, Hiroyuki Takanashi, Yumiko Fujita
Intern: Takako Ide, Tomoko Mizutani, Rena Maruoka, Mariko Ui, Masahiro Ono, Ayano Ishikawa

2. Purpose of Education

The 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.

3. Research Subject

Mechanism of dentin bonding
Adhesive of resin restoration systems to tooth substance and other restorative materials
Structure, diagnosis and treatment of dentin caries
Physico-chemical and manipulative properties of restorative materials
Durability of restorative materials
Pulpal response to restorative materials
Improvement of various restorative techniques for direct and indirect restorations
Improvement of various esthetic treatment techniques
Caries risk assessment and prevention of recurrent caries

4. Clinical Service

Operative Dentistry clinic provide restoration of teeth with fillings for dental cavities, trauma and tooth wear, and root canal treatments.

5. Publications

Original Article


Fixed Prosthodontics

1. Staffs and Students (April, 2008)
Professor Hiroyuki MIURA
Associate Professor Keichi YOSHIDA
Assistant Professor Hideya HAMANO, Ayako TOKUDA, Chiharu SHIN, Kosuke NOZAKI
Hospital Staff Masaya YOSHIMINE, Miho HASHIMOTO, Muneari MIYASAKA
Secretary Yoshiko UCHIDA
Graduate Student Shiho OTAKE, Kumiko KAWASHIMA, Yuji FUKUI, Chalida NAKALEKHA, Kenichi Goshima, Jinbao MA, Naosuke KUMAGAE

2. Purpose of Education
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. Research Subjects
1) Occlusion and Mastication (mandibular position, mandibular movement, articulator, masticatory efficiency)
2) Influence of occlusal contact on stomatognathic system including periodontal tissues. (Tooth displacement, distortion of alveolar bone, occlusal contact, proximal contact etc.)
3) Clinical application of All-Ceramic CAD/CAM FPDs.
4) Influence of occlusal height for an important prosthesis on the periodontal tissues of the antagonist.
5) Application of laser welding in crown and bridge restorations.
6) Influence of dental materials for periodontal tissues and biological body.
7) Functional analysis of abnormal stomatognathic function

4. Clinical Services
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 desesses 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.
5. Publications

Original Article


Pulp Biology and Endodontics

1. Staffs and Students (April 2008)

Professor
Hideaki SUDA

Associate Professor
Chihiro KOBAYASHI, Mitsuihiro SUNAKAWA

Junior Associate Professor
Atsushi TAKEDA, Hidemaru IKEDA

Assistant Professor
Arata EBIHARA, Nobuyuki KAWASHIMA, Hiroyuki MATSUMOTO, Takatomo YOSHIOKA, Reiko WADACHI, Noriyuki SUZUKI

Hospital Staff
Tomoatsu KANEKO, Izumi KIKUCHI, Hitomi ISHIMURA, Satomi TAKAHASHI, Yohsuke HAYASHI, Hidetoshi SAEGUSA

Graduate Student
Takahiro HANADA, Sachio YAHATA, Satoshi WATANABE, Carlos Gabriel ADORNO-QUEVEDO, Jing XU, Jun KAWAMURA, Yu KOIZUMI, Chizuko KOKUZAWA, Hitoshi SAKAUE, Toshihiro YOSHIOKA, Bolortuya GOMBO, Uraiwan CHOKUCHANACHAISAKUL

2. Purpose of Education

The aim of the course is to train and educate graduate dental students so that they can act as leading clinical scientists, researchers or practitioners of endodontics in the world. 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 pulp biology, neuroscience, bacteriology, immunology and material 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. The graduates from this course are expected to popularize new principles and techniques on endodontics among general dental practitioners and endodontic specialists.

3. Research Subjects

1) Defense systems in the dental pulp tissues
2) Elucidation of periapical pathosis and regulation of periapical bone destruction
3) Developmental mechanisms of dentin/pulp complex and horizon of its regeneration
4) A study on the root canal irrigation
5) A study on the development of the new apex locator
6) A study on the strain of the root canal dentin
7) The application of medicine to endodontics
8) The safety control in dentistry
9) Application of laser to endodontics
10) Electrophysiological approach to enamel, dentinal tubules and odontoblasts
11) Neuro-scientific research for the toothache
12) Logistic regression equation to screen for vertical root fractures using cone-beam CT (3DX)
13) Global Center of Excellence (GCOE) Program
   “International Research Center for Molecular Science in Tooth and Bone Diseases”

4. Clinical Services

Pulp Biology and Endodontics is in charge of the Endodontic Clinic in our Dental Hospital, and offers the global standard of endodontics to our patients. The representative treatments provided in our clinic are as follows:

- Diagnosis and treatment of pulpal and periapical diseases
- Protective procedures for the dental pulp
- Nonsurgical endodontic treatment
- Surgical endodontic treatment
- Bleaching discolored teeth
- Restoration of endodontically treated teeth
The latest development of endodontics is amazing as seen in root canal instrumentation by super-elastic NiTi rotary files, root canal length measurement with newly developed electronic apex locators, diagnosis by cone beam computed tomography, and microendodontics by using a surgical microscope. Especially, microendodontics has dramatically changed conventional “blind” endodontics into more predictable endodontics by efficient and reliable procedures under a lightened and magnified view. Also, we seek to provide evidence-based endodontic treatment based on our clinical research.

5. Publications

Original Article


Book

Advanced Biomaterials

1. Staffs and Students (April, 2008)
Associate Professor       Hidekazu TAKAHASHI
Assistant Professor      Hideo NAKAMURA
Research Associate       Naohiko IWASAKI
Graduate Student         Reza FAZAL
Research Student         Mitsufumi AKAKURA
Research Student         Ken-ichi BABASONO

2. Purpose of 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 is to achieve high quality of dental practice with well-understanding dental material and devices.

The aim for undergraduate 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.

The main program for graduate student is composed of the lecture and laboratory instructions for understanding physical and chemical properties of new materials and technology for dental use. Recent researches in our department will be also introduced.

3. Research subjects:
   2. Effect of immersion condition on mechanical properties of teeth substance.
   5. Development research of new gypsum investment for high melting alloy.
   6. Evaluation of physical properties of dental gold alloy casting.
   7. Corrosion behavior of dental gallium alloy.
   8. Bonding behavior of dental ceramic to dental alloy casting, especially titanium casting.

4. Publications
Original Articles
### Organic Biomaterials

1. **Staffs and Students (April, 2008)**

**Professor**
Kazunari AKIYOSHI

**Associate Professor**
Yoshiiro SASAKI

**Assistant Professor**
Akihiko WATANABE, Nobuyuki MORIMOTO, Shinichi SAWADA

**Research stuff**
Wakiko ASAYAMA

**Secretary**
Nanae NISHI

**Graduate Student**

Yayoi OZAWA, Setsuko YAMANE,
Tai HIRAKURA, Yuki MORITANI,
Sayaka TOITA, Koki KAMIYA,
Kozue EBIHARA, Asako SHIMODA,
Hironobu SUGIURA, Haruko TAKAHASHI,
Yoko TADA, Atsushi MUROTA,
Yuka YAMAMOTO, Junichi YASUOKA,
Yuji TSUCHIDO

2. **Purpose of Education**

Courses: Biomaterials, Advanced Medical Materials, Advanced Organic Materials

3. **Research Subjects**

1) Nanogel engineering for drug delivery system and tissue engineering
2) Chaperoning engineering for control of function of biomacromolecules
3) Liposome and membrane protein engineering towards *de novo* cell
4) Development of hybrid biomaterials

4. **Publications**

**Original Article**


2. Purpose of Education

In order to develop technology which may contribute to the advance in the medical science, lectures on functional molecules from basic to advanced knowledge on molecular design for specific purpose, mainly concentrated on medical application would be executed. Theories on functional molecules and overviews on medical system would be lectured in Graduate School of Medical and Dental Sciences. Students would have chances to learn about Genomics and Bio-intelligent system in Graduate School of Biomedical Science.

3. Research Subjects

1) Decellularization of native tissue for regenerative medicine

In order to obtain a novel scaffold which can be applied for regenerative tissue, ultra-high pressurization method was developed for the complete elimination of the cells and inactivation of the viruses.

2) Inducing molecular aggregation using ultra-high pressurization

The basic and applied science on molecular aggregation triggered by hydrogen bonding at over 6,000 atm is studied. This technique is being applied for hybridization of DNA with polymer for drug delivery system.

3) Bio-interface

To investigate how the materials interact with biological cues such as phospholipids, proteins, or cells, precisely controlled surface via atomic transfer radical polymerization was prepared. The basic research on physical and biological properties of this surface is being investigated.

4) Control of cell functions by physical stimuli

Using physical stimuli such as nano-vibration or pressure, the technology for the control of cell functions such as the proliferation and differentiation is being developed.

5) Search for novel drugs based on medicinal plants

There are countless natural medicines portions which are not revealed so far. By screening novel drugs originated from Brazil, China, or Japan area for the cancer or dementia treatments the novel bioactive compounds are isolated and being investigated.

6) Development of high functional adhesive

For the development of stable adhesive for precious metal and resin, high functional monomer possessing adhesivity to the precious metal is being developed.

4. Clinical Services

The development of functional molecules can provide novel materials for the clinical application such as blood vessel,
cornea, skin, or bone. Unlike the conventional materials which have been used in clinics so far, it would be possible to promote or suppress specific biological response using functionalized materials. Furthermore, the screening essential drug compound for certain purpose, it would help the patients to be treated with higher efficiency and less pain.

5. Publications

Original Article


Removable Partial Denture Prosthodontics

1. Staffs and Students (April, 2008)

Professor: Yoshimasa IGARASHI
Associate Professor: Hiroshi MIZUTANI
Junior Associate Professor: Masayuki HIDESHIMA, Kenji FUEKI
Assistant Professor: Masayuki SATOU, Takeshi UENO, Ichirou MINAMI, Teruyasu NAKAMURA, Jyurou WADACHI, Kumiko ARIDOME, Syusuke INUKAI
Tokunin Assistant Professor: Ryunosuke KAZAMA (since October)
Hospital Staff: Tomohiro ANDO, Eiko YOSHIDA, Mieko YOSHIMURA, Masahiro Ona, Takeyoshi SUGIURA
Secretary: Haruka MATUURA
Graduate Student: Kyouko TUCHIYA, Yoshiaki SHIMURA, Hiroshi FURUMOTO, Kouji NAGATA, Masahito OOIDA, Kouta OKANO, Yuka ABE, Kazuki ISHIHATA, Yoshiyuki SAKAI, Jyunishirou WADA, Kousuke UMEHARA, Aiichirou AO, Yuuki IWAKI, Kengo FUJIKI, Keita YODA

2. Purpose of Education

Removable partial denture prosthodontics is a branch of Oral Health Science that deals with replacement of missing teeth and oral tissues to restore and maintain oral form, function, appearance, and health. Main objective of removable partial denture prosthodontics is to provide students in the graduate course opportunity to master standard method of diagnosis, technical skill, applied skill in lectures and practical works. Students are also taught on how to adapt removable prosthesis in the mouth with missing teeth from a biological and science and engineering standpoints.

3. Research Subjects

1) Association between food mixing ability and electromyographic activity of jaw-closing muscles during chewing of a wax cube.
2) Evaluation of Implant over dentures.
3) Assessment of the Pronunciation in Subjects with Sound Dentition.
4) Influences of Fixed Metallic Abutments on MRI Artifacts.
5) Adhesive Force of Magnetic Assembly maxillary to Denture Base with Self-Curing Resin.
6) Effect of direct retainer and major connector designs on RPD and abutment tooth movement dynamics.
7) Chewing ability's association with oral health-related QoL in prosthodontic patients.
8) The relationship between missing occlusal units and oral health-related quality of life in SDA patients.
9) Influence of the arrangement of the magnetic attachments in the remaining dentition upon the denture mobility.

4. Clinical Services

Patients with missing teeth have increased in step with the aging of the population, so improving their quality of life has been required. Dental prosthesis clinic provides removable partial dentures to patients with missing teeth by the best treatment technique. The dentures are individually designed from mobility of dentures, oral sense, pronunciation and aesthetic points of view.

5. Publications

Original Article

Oral Implantology and Regenerative Dental Medicine,
Dental Implant Clinic

1. Stuffs and Students
Professor Shohei KASUGAI
Associate Professor Makoto SHIOTA
Junior Associate Professor Noriko TACHIKAWA
Assistant Professor Hisatomo KONDO, Shinji KURODA
Hospital Stuffs Toru KANAI, Hidemichi KIHARA, Kyoko TAKAFUJI, Hidemi NAKATA, Tatsuya FUJIMORI, Yoko YAMAGUCHI
Secretary and Technical Assistant Michiko SUZUKI
Graduate Student Shigehisa OKABAYASGI, Mitsumune ODA, Hiroshi KOBAYASHI, Takahiro NAKAMURA, SAMEE Mayurach, Maho OZEKI, Kazuhiro KON, Tetsu MACHIDA, Katsuichihiro MARUO, Norihide UENO, Junhi PARK, Myat NYAN, Malik Ismail HUDIEB, Junichi KIMURA, Yuki DATE, Kanako NORITAKE, Hisham Khalifa ROJUBANI, Reena RODRIGUEZ, Srilatha BHARGAVA, HAO Jia, Tokuo AKINO, Tomoko NAGATOMO, Masaki FUJII, Akiko HURUICHI, Osama ZAKARIA

2. Purpose of Education
The current dental implant treatment is very predictable and it has several advantages compared to the treatments with bridges or removable dentures. Main objective of oral Implantology in the undergraduate course is to provide students opportunities to study basic knowledge about dental implant treatment: the characteristics and whole procedure of this treatment from examination, diagnosis and treatment planning which are followed by dental implant surgery, prosthetic treatment and maintenance. The graduate course provides recent and advanced levels of knowledge of dental implant treatment. The training course of dental implant treatment provides trainees opportunities to learn much deeper knowledge and skill of dental implant treatment by giving them chances to assist the clinical stuffs in dental implant treatment. The graduate course of oral Implantology and regenerative dental medicine gives students chances to learn recent concept of tissue engineering and to predict the future of this attractive scientific and clinical field in the active discussions.

3. Research Subjects
(1) Examination of patients received dental implant treatment
(2) Development of dental implant
(3) Diagnosis and treatment planning in dental implant treatment
(4) Treatment of implatitis
(5) Regeneration of bone and periodontal tissues

4. Clinical Services
We treated edentulous patients with dental implants in Dental Implant Clinic, Dental Hospital. We installed approximately 1,800 implants from April 2008 to March 2009. Number of the patients in the Dental Implant Clinic is increasing every year because of the increase of the aged population and the predictability of the treatment. Furthermore, since dental implant treatment is invasive than conventional treatments, patients prefer to be treated in big hospitals rather than private dental offices. Our clinical cases are from simple cases to extensively-advanced cases including fully edentulous cases including bone reconstruction and/or augmentation. Notably, clinical cases of complications of patients, who were treated in other clinics, are increasing recently.
5. Publications

Original Articles


Complete Denture Prosthodontics

1. Staffs and Students (April, 2008)

Professor
Shunsuke MINAKUCHI

Assistant Professor
Tatsuro UCHIDA, Yukiko FUJINAMI,
Norihisa AKIBA, Yoshinori Kaiba,
Manabu KANAZAWA

Hospital Staff
Natsumi AOYAMA, Yusuke SATO,
Takuya TOKITA, Soichiro IMAMURA,
Kei OHYA, Yuta KASUGA

Graduate Student
Maiko IWAKI, Mai Okubo,
Yuki KUMAMOTO, Yuuki HIRAJIMA,
Akinobu AZUMA, Masanao INOKOSHI,
Yuriko KOMAGAMINE, Shin TAKESHITA,
Hiroshi KATASE

2. Purpose of Education
Complete denture prosthodontics is a discipline which contributes to better quality of life for edentulous patients by full mouth reconstruction treatments with complete denture prosthesis. The purpose of education is to get the knowledge about the dynamic state of soft tissues around dentures during oral functions, occlusion, and technical skills required to fabricating complete dentures.

3. Research Subjects
1) Relationship between denture treatment and body function
2) Palatal coverage disturbance in masticatory function
3) Stress analyses of implant overdenture
4) Factorial analysis of complete denture prosthesis
5) Resilient denture lining material
6) CAD/CAM system for fabricating complete dentures
7) Evaluations of masticatory performance using color-changeable chewing gum

4. Clinical Services
Complete denture prosthodontics clinic provides edentulous patients with planned prosthodontic treatments, and maintains the restored function for long periods. In addition, we set original criteria and objectively evaluate effect of our prosthetic treatments.

5. Publications
Original Article
Maxillofacial Anatomy

1. Staffs and Students (April, 2008)
Professor
Yasuo YAMASHITA
Associate Professor
Tatsuo TERASHIMA
Assistant Professor
Shun-ichi SHIKANO Tatsuhiko ABE
Technical Official
Toshimitsu YAMAMOTO Michi MATSUBARA

2. Purpose of Education
Main educational purpose of maxillofacial anatomy in graduate course is to provide students opportunity to understand the function of various oral organs in a morphological viewpoint and ability to evaluate various vital phenomenon encountered in medical practice.

3. Research Subjects
1) Mechanism of epithelial attachment of junctional epithelium in human gingiva.
2) Comparative histology and embryology of teeth.
3) Observation on the structural features of oral mucous
4) Anatomical names of the structures of human skeletal system.
5) Biological analysis of root formation of mouse molars by long-term organ culture method.
6) Mechanisms of enamel formation in amelogenesis imperfecta rat (ami).
7) Role of the dental sac in the formation and the development of the dental and periodontal tissues.
8) Morphological researches on Sinus maxillaris.
9) Studies on regeneration of jawbone
10) Anatomy for dental implant

4. Publications

Original Article

Review Article

Book

Special Lecture
2. Terashima T: Structure of wall around the oral cavity and pathway to oral cavity of the nerve and artery. Nihon Dental College, 1, Sep,2008.
Cognitive Neurobiology

1. Staffs (April, 2008)
Affiliate Professor Atsusi IRIKI
Associate Professor Miki TAOKA
Junior Associate Professor Hisayuki OJIMA
Assistant Professor Michio TANAKA
Secretary Masae HIYOMORI

2. Education
1. Fundamentals of sensory organ and nervous system
   Somatosensory, visual, auditory and chemical senses are basic sensory modalities of humans. Stimuli arising from the environment are detected by sensory organs, and processed and transmitted through sensory nervous system. Finally, sensory information is conveyed to the brain. The objects of this study are understanding the anatomy of peripheral nervous system and the physiology of sensory processing in subcortical nervous system.

2. Practical course for physiology
   This course contains four experiments, 1) electrophysiology of somatosensory cortex, 2) reflexes of eye movements, 3) electromyograms of masticatory muscles, 4) autonomic control and automaticity of the heart. The objects of this practical course is to understand the basic physiological mechanism of human adaptive behaviour, the fundamentals of experimental techniques and how to present the results of experiments.

3. Central nervous system
   Understanding the environment and planning appropriate actions are major functions of human brain. The main objects of this study are understanding the mechanisms of sensation and integration of information processing in the brain.

3. Research Subjects
   1) Brain mechanisms of symbol manipulation.
   2) Neuronal mechanisms of tactile recognition.
   3) Neuronal mechanisms of multimodal processing in the primary auditory cortex.

4. Publications
   Original Article

   Review Article

   Book
Molecular Craniofacial Embryology

1. Staffs and Students

Professor  
Sachiko Iseki

Associate Professor  
Masa-Aki Ikeda

Assistant Professor  
Masato Ota

Part-time Lecturer  
Shumpei Yamada, Shigeru Okuhara, Kaori Kondo, Ayako Mikura

Graduate Student  
Juan Liu (Gerodontology), Takashi Nuri (Osaka Medical College Plastic and Reconstructive Surgery), Ryousuke Nagaoka (Maxillofacial Surgery), Yuki Date (Oral Implantology and Regenerative Dental Medicine), Khandakar Abu Shameem MD. Saadat (April—)

Foreign Researcher  
Solachudin J. A. Ichwan (~March), Olivier Philippe (April~)

2. Purpose of education

Section of Molecular Craniofacial Embryology studies molecular mechanisms of craniofacial morphogenesis including regulation of cell proliferation and differentiation, and apply these achievements to regenerative medicine. Main objective of our section in the graduate course is to provide students with opportunities to define the research topic by themselves with the advice of laboratory staffs. Students can learn research laboratory techniques according to their projects, ways to make strategies, and scientific English writing.

3. Research subjects

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 their stemness
4) Regulation of gene expression in cell growth and stress response
5) Nuclear architecture and function in regulating gene expression
6) Dysregulation of tumor suppressors in oral cancer

4. Publications

Original articles


2008.

Review Article


Cellular Physiological Chemistry

1. Staffs and Students (April, 2008)

Professor Ikuo Morita
Associate Professor Ken-ichi Nakahama
Junior Associate Professor Hiroshi Fujita, Takako Hase, Chieko Yokoyama
Assistant Professor Kotaro Kato
Tokuninn Assistant Professor (COE) Olga Safronava

Graduate Student Bhattacharjee Rajib, Yoko Aoi,
Praween Wayakanon
Research Student Wanida Techawattanawisal, Nakalekha Chalida,
Jizhong Yuan, Jun-ichi Tsugawa,
Jiying Wang, Noriaki Shimada,
Atsuko Taki, Noriko Oshima

Professor (Nano Medicine DNP) Mayumi Abe
Assistant Professor (Nano Medicine DNP) Motohiro Komaki, Tomoko Yoshida
Associate Professor (Natural Resources & Physiological Chemistry) Takahiro Sato
Assistant Professor (Natural Resources & Physiological Chemistry) Masako Akiyama

2. Purpose of Education
For undergraduate students. We have some classes in biological chemistry for the third grader. In these classes, the students should understand basic biochemistry and physiology under healthy/diseased conditions.

For graduate students. These students can choose the one of themes in our lab. These students are expected to solve the problems by themselves. However, appropriate suggestions will be given by at least three supervisors whenever you want.

3. Research Subjects
1. Regulatory mechanism of angiogenesis and application to regenerative medicine
2. Bone remodeling and cell communication
3. Inflammation under hypoxic conditions (epigenetic control of gene expression)
4. Life of gap junction

4. Publications

Original Article

Oral and Maxillofacial Surgery

1. Staffs and Students (2008)

Professor
Teruo AMAGASA

Associate Professor
Hiroshi IWAKI
Junichi ISHII

Junior Associate Professor
Satoshi YAMAGUCHI
Naoya ARAI (until February)

Assistant Professor
Narikazu UZAWA
Yutaka SATOU
Hiroyuki YOSHITAKE
Yasuyuki Michi
Kazuto KUROHARA (from March)

Hospital Staff
Takashi MISHIMAGI
Kouichi NAKAKUKI
Yoshio OHYAMA
Yasuhiro YUKI
Youhei TSUTAKI (from April)
Mie MOCHIZUKI
Mieh SUZUKI
Misa HOSOKI (until March)
Yuko KATSUKI (from April)
Aya KAWAMATA (from April)
Aya ITOU (until March)

Graduate Student
Hanna IGARASHI (until March)
Yuko KATSUKI (until March)
Aya KAWAMATA (until March)
Erina NAKAMURA (until March)
Kenichirou (until March)
Natsuko TAKATSUKA
Nobuyoshi TOMOMATSU
Keiichi HAMADA
Tadanobu ARAGAKI
Begun Asuma
Hiroaki Satou
Junichi TSUGAWA
Nobuhiro KATAOKA
Keiko MAEDA
Tasuku KIHARA
Yasuhiro KURASAWA
Ryousuke NAGAOKA
Tomomi SAKUMA
Chieko MICHIKAWA
Hiroyuki NAKACHI
Paksinee Kamolratanakul
Junya AOYAGI
Hiroyuki ENDOU (from April)
Daisuke MIYAJIMA (from April)
Yoshimi NAKATA (from April)
Erika OHUE (from April)
Jun SUMINO (from April)
Takashi WATANABE (from April)
Jose maria seiyi SHINDOI ARAKAWA (from April)

2. Purpose of Education
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. 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.

4. 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.

5. Publication
Original Article
Maxillofacial Orthognathics

1. Staffs and Students (April, 2008)
   Professor Keiji MORIYAMA
   Associate Professor Shoichi SUZUKI
   Junior Associate Professor Takashi ONO, Naoto SUDA
   Assistant Professor Yoshiyuki BABA, Tsuji OBA, Takuya OGAWA
   Graduate Student Takato INOKUCHI, Mitsu HATTORI, Akiko MINATO, Shinta Wirahadi KUSUMAH, Ganburged GANJARGAL, Ng Inn WO, Hideki KAMATA, Hiroyuki SUZUKI, Nana OKAMOTO, Kaori TAKECHI, Rina HIKITA, Tsutomu MATSUMOTO

2. Purpose of Education
   The goal of the Education program in Maxillofacial Orthognathics is to provide an education related to craniofacial growth and development, and stomatognathic function in order to develop proficiency in improvement of a wide variety of malocclusions and malformations.
   Fourth and fifth dental students will attend lectures and clinical laboratories, and fifth and sixth students will participate in the patient care clinic to acquire a broad range of general knowledge of a wide variety of malocclusions and malformations, and involvement of treatment. Tutorial lessons will be also provided students as a part of clinical lecture so that it supports them to understand cleft lip and/or palate and other congenital craniofacial conditions.
   The Graduate Program provides the biological science education related to the control mechanism of patterning and morphogenesis in the craniofacial region using molecular genetics and morphological analysis through patients born with cleft lip and/or palate and other congenital craniofacial conditions. It also provides the clinical education of orthodontics necessary support to gain an appreciation of their role in the team approach to comprehensive patient care.

3. Research Subjects
   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) Evaluate changes in soft tissue following maxillofacial surgery using 3D images

4. Clinical Services
   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.

5. Publications
   Original Article


Maxillofacial Prosthetics

1. Staffs and Students (April, 2008)

Professor
Hisashi TANIGUCHI

Junior Associate Professor
Yuka SUMITA

Assistant Professor
Toshiaki IIDA, Mariko HATTORI

Hospital Staff
Yuko TERUYAMA, Mai MURASE

Secretary
Yuki SAKURAI

Graduate Student
Ken INOHARA, Takafumi OTOMARU, Naoko MINAMISAWA, Taiji HOSHIAI, Nafees Uddin CHOWDHURY, MD. Ziauddin, Masatake HOJO, Chang Qingan, Rie TODA, Jien MORIMATA

Special Student
Mihoko HARAGUCHI, Chiaki KADOTA, Ayako HAGINO

2. Purpose of Education

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.

3. Research Subjects

1. Diagnosis and treatment for patients with maxillofacial defects
2. In vivo application of modal analysis for maxillofacial prosthodontics
3. Acoustic analysis of speech
4. Medical and dental art

4. Clinical Services

Maxillofacial Prosthetic clinic provides the restoration of functional and esthetic disorders of maxillofacial areas that are caused by congenital developmental or acquired diseases by means of the high-advanced dental and medical cares.

5. Publications

Original Article

Review Article

Dentistry for Persons with Disabilities

1. Staffs and Students (April, 2008)
   Associate Professor  Tsuneyoshi YAMAZAKI
   Junior Associate Professor  Osamu SHINOZUKA
   Junior Associate Professor (Part-time)  Minoru INADA, Yasuka KUSUMOTO, Yohei TAKEUCHI
   Hospital Staff  Takae SAKAMOTO, Syohei TAMURA, Mariko WATANABE
   Graduate Student  Taisuke FUJIBAYASHI, Moriyuki NAKAMURA, Naoki HAYASHI, Norihiko KANAKUCHI
   Research Student  Hiromichi MIYAZAKI, Manami ARIFUKU

2. Purpose of Education
   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 medical problems.
   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. Research Subjects
   1) General research about the dentistry for persons with disabilities
   2) Oral bacteria and systemic illness
   3) Oral biofilm formation and elimination (Drug Delivery system)
   4) Oral stimulation and cerebral function
   5) Development of the paste for the dry mouth
   6) Development of the welfare apparatus (Toothbrush with irrigation and suctioning capabilities, e-Brush II®, etc)
   7) Oral care by e-Brush II®
   8) GINGIVAL overgrowth of the pharmacogenic
   9) Development of the clinical pathway of the systemic illness
   10) Microanalysis of the salivary chemical component
   11) Functional water
   12) Dental phobia

4. Clinical Services
   The clinical purpose of our section 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, mental retardation, autism, etc.
   2) The patients requiring systemic support are internal impediment, dental phobia, etc.

5. Publications
   Abstract
Metallic Biomaterials (Metals)

1. Staffs and Students (April, 2008)

Professor Takao HANAWA
Associate Professor Naoyuki NOMURA
Assistant Professor Hisashi DOI, Yusuke TSUTSUMI
Tokunin Assistant Professor Yasuko SEKI
Secretary Toshie NAKANISHI
Researcher Svitlana KOPYL, Emilia PECHEVA
Graduate Student Kei OYA, Yuta TANAKA,
Madoka MURAKAMI, Suyalatu,
Hitomi HIRUMA, Yuko TANAKA,
Ryota KONDO
Research Student Kenichi IIYAMA

2. Purpose of Education

We aim to understand the structure and character of nano-layers formed on metals surface, the formation of body tissues on materials. Especially, we focus the reaction between biomolecules and cells on metals with the evaluation of nano-scale change of surface oxides layer. The goal of our laboratory is to select appropriate biomaterials for various medical cares by understanding crystal structure, processing, heat treatment, mechanical properties such as strength and toughness, and electrochemical character of metallic biomaterials.

3. Research Subjects

1) Bio-functionilization of metals with surface modification
2) Development of novel alloys for biomedical applications
3) Development of porous metals composites with mechanical compatibility
4) Development of Zr-based alloys for minimizing MRI artifacts

4. Publications

Original Article


Review Article

2. Tsutsuzumi Y: Effects of Pd and Pt on corrosion behavior of Zr in simulated body fluid. The Journal of Dental


**Book**


**5. Others**

**Invited lecture**


11. Hanawa T: Biofilm formation on orthopedics implants and infection, Plasma ion forum, Kyoto, April 2008.


Patent

Award
1. Staffs and Students

Professor
Kazuo TAKAKUDA

Assistant Professor
Yoshiiisa KOYAMA, Masahiro NAGAI

Research Assistants
Hiroko MATSUMOTO, Seiji ASODA,
Tomoyouki KAWAI, Takayuki ARITA,
Takao IRIBE, Kazunori UEDA,
Hiroyuki KADONO, Yuki SAITO,
Hiroshi YANAGIDA, Teruaki YOSHIDA,

Graduate Students
Satoshi ONO, Yutaka FUKUDA, Masahiro WATANABE,
Tomoyuki KAWAI, Atsushi MITA, Tetsuro WATANABE,
Takao IRIBE, Takashi KITAO, Kimihiro OKANO,
Hiroshi YANAGIDA, Ryo KOKUBUN,
Tomoyuki KAWAI, Yuki SAITO,
Hiroyuki KADONO, Teruaki YOSHIDA,
Hazuki KOSHITOMAE, Ryo KOKUBUN,
Yutaka FUKUDA, Masahiro WATANABE,
Atsushi MITA, Tetsuro WATANABE,
Takashi KITAO, Kimihiro OKANO,
Ryo KOKUBUN, Katsunari MURAKAMI

2. Purpose of Education

The class is for the understanding of fundamental concepts of mechanics, and introduction to the advanced studies including the biomechanics of living bodies, tissues, and cells. Some applications to the basics of medical devices with mechanical functions are also discussed.

3. Research Subjects

1. Remodeling of structural and supporting tissues under mechanical stimuli

Biomechanical studies on structural/supporting tissues such as bones, ligaments and tendons are carried out. In particular, to elucidate the adaptation mechanism of these tissues, the effects of controlled mechanical stimuli applied to living cells and tissues are investigated.

2. Development of Bone Regeneration Device with Bioabsorbable Organic/Inorganic Composite Materials

Devices for bone regeneration with the use of bioabsorbable Organic/Inorganic Composite materials are developing. In vitro and animal experiments are carrying out for pre-clinical experiments. Furthermore, bone regeneration mechanism when implanting Organic/Inorganic composite materials is examined by in vitro and in vivo tests.

3. Development of Regeneration Devices for Soft Tissues with the use of bioabsorbable materials

Regeneration technology for structural/supporting tissues such as ligaments, tendons, dura mater, peripheral nerves and small blood vessels are investigated utilizing bioabsorbable polymers. Our strategy is based on the regeneration by the self-healing mechanism achieved through the optimum milieu provided by biomaterials. We already have promising results in the animal experiments for the cases of dura mater and peripheral nerves.

4. Development of Soft and Flexible Resin Base Dentures for Elderly Persons

We are developing innovative soft and flexible resin base dentures those are able to moderate the stimulation to mucous membranes and give the patients to get the moderate masticatory force for elderly persons. As the soft and flexible materials for the denture base, we have developed copolymer of 2-ethylhexyl methacrylate and methyl methacrylate that shows relatively hard properties or very soft properties depending on the amount of the contents. By utilizing these new materials, we are now designing new soft and flexible resin base dentures with gradient functions.

4. Publications

Original Articles


**Presentations**


Clinical Anatomy

1. Staffs and Students (April, 2008)
Associate Professor   Keiichi AKITA
Research Associate Kumiko YAMAGUCHI
Graduate Student Kosuke MATSUNAGA, Naoki MATSUOKA, Atsuo KATO

2. Purpose of 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.

3. Research Subjects
1) Anatomical study of the shoulder joint and rotator cuff.
2) Analyses of the lamination in the masticatory muscles with special reference of nerve supply
3) Embryological study of the differentiation of cloaca and surrounding muscles.
4) Cadaveric study of the female pelvis for the gynecologic oncology and colposcopy

4. Publications
Original Article
Plastic & Reconstructive surgery

1. Staffs and Students (April, 2008)
   Junior Associate Professor  Hiroki Mori
   Assistant Professor (Hospital Staff)  Masumi Suzuki
   Graduate Student  Petros R., Hilati A

2. Purpose of 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. Research Subjects
   Basic research
   1. Various vascularized tissue transfer
   2. Development of wound dressing using Chitosan
   3. Development of artificial nerve
   Clinical research
   1. Cleft lip and palate
   2. Microtia
   3. Sensory recovery of transfer tissue
   4. Breast reconstruction
   5. Skin cancer
   6. Esophagus reconstruction

4. Clinical Services
   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), LASERs, cutaneous malignant tumor, skin ulcer, breast reconstruction, head and neck reconstruction, facial palsy, axillary osmidrosis.

5. Publications
   【Original article】
Head and Neck Surgery

1. Staff s and Students

Professor: Seiji Kishimoto
Assistant Professor: Satoshi Shirakura (March), Ryosuke Kamiyama (April)
Hospital Staff: Tomomasa Hayashi (April)
Secretary: Mariko Toa
Graduate Student: Ryuichi Hayashi (March), Mituru Ebihara, Toru Ugumori, Tomomasa Hayashi, Masakazu Miyazaki

2. Purpose of Education

In the Department of Head and Neck Surgery, our goal is to deliver the highest possible clinical care for patients with benign and malignant tumors of the head and neck.

Postgraduate residents participate in a variety of head and neck surgeries. Weekly clinical rounds help to extend the experience beyond the operating room. Tumor conference is held weekly with a lively interdisciplinary discussion including otolaryngology, plastic surgery. They are also offered opportunity to participate in various clinical research projects.

3. Research subjects

1) Anatomy of the skull base.
3) Clinical application of new device of endoscopic examination.
4) Surgical treatment of pediatric head and neck tumors.

4. Clinical Services

Our team treats patients with tumors of the thyroid gland, salivary glands, oral cavity, larynx, pharynx, paranasal sinus, and skull base, and sarcomas of the soft tissue and bone.

5. Publication

Original Article


Review Article

Book

International Congress

2. Tsunoda, S Kishimoto: Digital image enhanced for detailed endoscopic observation: possibility of the early detection for otolaryngological lesions. 12th Japan-Korea Joint Meeting of Otorhinolaryngology-Head and neck Surgery, Nara, April, 2008
Diagnostic Radiology and Oncology

1. Staff and Students (April to December, 2008)

Professor
Hitoshi Shibuya

Associate Professors
Isamu Ohashi and Ichiro Yamada

Lecturers
Kaoru Hanafusa and Mitsuhiro Kishino (Spt.〜),
Ryuji Ishida (~Aug.),

Research Associates
Kazunori Kubota, Rin Chaou,
Fumio Ayukawa (~Spt.) Yoshio Kitaizume (Oct.〜),
Keiji Hayashi

Hospital Staff members
Kazuma Toda, Takaya Takeguchi (~Oct.),
Akira Toriihara, Satoko Arai (~Nov.),
Shuichiro Nakaminato (~June),
Akiyuki Matsuhisa, Daisuke Amano

Graduate Students
Piao Yong Nan, Boldo Bayahkhuu,
Abulajiang Tayier and Rahman MD Khalilur

Research Students
Kiyomi Amemiya and Yoshiaki Katada

2. Purpose of Education

The Diagnostic Radiology and Oncology section covers the fields of diagnostic radiology, nuclear medicine, radiation oncology and biology, and radiation physics. The objectives of our institution of the graduate course are to study radiological medicine from the area of human anatomy and pathology, physiology, and clinical medicine. Our section is composed of over 60 members; about 40 of them are serving as heads or rotating staff members of general hospitals in the metropolitan area and approximately another 20 of them are studying and working as members of the university and/or university hospital staff. Postgraduate courses are made to study basic/clinical radiation medicine in order to obtain license as a specialist from the Japan Radiological Society (JRS). JRS specialist licenses are granted in two fields: diagnostic radiology and radiation oncology. Doctors of our section are also expected to obtain PH.D. degree and 34 students have obtained a degree of PH.D. under the guidance of Prof. Shibuya.

3. Clinical Services and Research Subjects

A. Diagnostic Radiology

CT section:
After the introduction of two sets of multi-slice CT machines (MDCT: 64 arrays), number of patients examined has been markedly increased, and MDCT has enabled CT angiography of coronary artery as well as the cerebral artery. MDCT has offered a chance of on the day examination and early image diagnosis of disease. The clinical CT studies for liver diseases have offered the chance to get doctor degree for three doctors.

MRI section:
Two sets high speed MRI (1.5T) are enable to detect early findings of cerebral infarction by DWI (diffusion weighted image). Calculation of apparent diffusion coefficients (ADCs) of the kidney and liver has provided data for studying the physiology and pathology of these parenchymatous organs.

Interventional Radiology:
TAE (trans-catheter arterial embolization) for liver cell carcinoma and PTA (percutaneous trans-catheter angioplasty) for peripheral arterial occlusive disease have been routinely done to-date. Emergency angiography can be carried out at any time at any time as occasion calls.

Ultrasonography:
Breast disease and soft tissue ultrasonography is performed in the radiological center. Combined ultrasonography and MRI examinations have provided precise information for the diagnosis and treatment of breast cancer.

B. Nuclear Medicine

On Nov. 2006, two sets of PET/CT examination have been introduced and started operation. About 15 patients a day are examined using 18F-FDG/CT. SPECT examinations have been performed in about 10 cases of disease every day. Clinical data obtained in the diagnosis of head and neck and breast cancer have offered the chance to study pathology of head/neck cancer and breast cancer.
C. Radiation Oncology

Low-dose rate brachytherapy for head/neck as well as prostate cancer is a unique character of head radiation oncology section. The 720 new patients referred for radiotherapy in 2008 included 250 cases of head and neck cancer patients, 120 prostate cancer patients and 110 breast cancer patients. Over 140 oral/oropharynx cancer patients were treated by brachytherapy in 2008. The results of brachytherapy were compatible to the results obtained by surgery, and post-treatment quality of life was better than after surgery.

We are now conducting gene analyses of oral cancers, and comparisons between tumor gene expression and the results of treatment are providing new information in regard to the treatment of head and neck cancers.

4. Manuscript


5. Congress


Biostructural Science

1. Staffs and Students (as of April, 2008)

Professor
Yoshiro TAKANO

Associate Professor
Makoto J TABATA

Assistant Professor
Otto BABA, Masayuki YOSHIMI
Yoko SHUDA (on leave for child care)

Technician
Hachiro ISEKI

Secretary
Yuichiro NAKAI

Graduate Student
Yi LI, Kazunori HIGUCHI,
Hiroto NAKAYAMA, Takuya NOTANI,
Masud AHMAD, Devi Sewvandini ATUKORALA

Research Students
Hitoshi TAMAKI, Nobuyuki TAKAHASHI,
Jun-ichi MATSUNARI

2. Purpose of Education

[Undergraduate Education]
Provide dental students with the essential knowledge and methods of studies necessary to understand fundamentals of structure and function of the human body, based primarily on macroscopic- and microscopic anatomy (Histology), including dissection lab works which lasts nearly 3 months. Emphasis is placed on the structure and function of oral and maxillofacial regions including teeth, periodontal tissues, salivary glands and temporomandibular joints, as well as muscles and nerves related to these structures. These comprise major part of the largest teaching module of the 3rd-year dental education curriculum and are expected to build solid basis for future studies of advanced dental science and clinical medicine.

[Graduate School]
Provide graduate students with updated information of mechanisms of biological mineralization, structural features, as well as ontogenic and evolutional aspects of the development of biological hard tissues, and give a lab course of essential methods for structural analyses of hard tissues, particularly of teeth and periodontal tissues.

3. Research Subjects
The mechanisms of dental and periodontal tissue formation and their regeneration is the central focus of our research. Followings are rough description of current research subjects in our laboratory.

1) Biological mineralization.
2) Induction and/or regeneration of dental and periodontal tissues.
3) Reaction-diffusion phenomenon in biological systems
4) Origin and evolution of tooth
5) Molecular mechanisms of tooth development
6) Role of dentin matrix proteins in the development of root and periodontal tissues
7) Sensory apparatus in masticatory systems.

4. Clinical Services

5. Publications

Original Article


Review Article

Book

Awards

Abstracts

[International Meetings]


[Domestic Meetings]
1. Takano Y: 石灰化機構から象芽細胞と骨芽細胞の異同を探る、日本解剖学会シンポジウム: 象芽細胞と骨芽細胞の違いを考える、第113回日本解剖学会学術大会、平成20年3月27日～29日、大分大学

2. Inohaya K, Takano Y, Kudo A: Analysis of the Dharma-medaka mutant, which shows a defect in formation and/or maintenance of intervertebral region. 第41回日本発生生物学会 2008年5月28日～30日、徳島

3. Inohaya K, Takano Y, Kudo A: 脊椎骨融合を示すダルマメダカ変異体の原因遺伝子の解明 Analysis of the Dharma-medaka mutant, which shows a defect in formation of vertebral column、日本動物学会第79回大会 9月5日～7日福岡大学


[Invited Lectures]

2. Takano Y: Role of odontoblasts and osteoblasts in mineralization of dentin and bone, Symposium on odontoblasts


Pharmacology

1. Staffs and Students (April, 2008)

Professor Keiichi OHYA
Associate Professor Hitoyata SHIMOKAWA
Assistant Professor Yukihi TAMURA
Assistant Professor Kazuhiro AOKI
Technologist Mariko TAKAHASHI
Secretary Chikako KIDO
Graduate Student SOYSA Hennadige Niroshani Surangika

Wantida SRIARJ (Developmental Oral Health Science)
ALLES Chrisman Neil Roshan Alexander
Nobuyoshi TOMOMATSU (Maxillofacial Surgery)
Kenichi NAGANO
Hiroyuki NAKACHI (Maxillofacial Surgery)
Naoki HAYASHI (Dentistry for Persons with Disabilities)
Toshimi SATO

2. 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 body 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. Research Subjects

1) Drug effects on the formation mechanism of teeth and bone
2) Pharmacological analysis of bone resorption mechanism
3) Development of inhibitors for bone resorption and their clinical trials
4) Toxicity of heavy metals in mineralized tissue

4. Publications

Original Article

Tissue Regeneration

1. Staff (April, 2008)
Associate Professor Tamayuki SHINOMURA

2. Purpose of Education
Our laboratory is interested in the molecular mechanisms underlying the formation and maintenance of connective tissues including cartilage and periodontal tissues. Our goal is to control the restoration and regeneration of the tissues. To achieve this goal, we are focusing on extracellular matrix molecules specifically expressed in the tissues and transcription factors regulating their expressions. Therefore, in our graduate course, we provide students opportunity to study molecular biology and extracellular matrix biology.

3. Research Subjects
1) Study on transcription factors necessary for the maintenance of chondrogenic phenotype.
2) Study on novel genes actively expressed in periodontal tissues.
3) Study on the molecular dynamics of extracellular matrix in connective tissue.

4. Publications
Original Article
1. Staffs and student (April, 2008)

Professor Masaki Yanagishita
Associate Professor Miki Yokoyama
Junior Associate Professor Yasuhiro Kumei
Assistant Professor Katarzyna Anna Podyma-Inoue
Technical staff Kazue Terasawa
Graduate student Takahiro Masa

2. Purpose of education

Extracellular matrix is a critical constituent of multicellular organisms by functioning as scaffold for body structures and providing internal environment for cell activities. Our section focuses on the research and education on molecular composition, biological functions and pathological processes involving extracellular matrices.

3. Research subjects

a. Studies on the biological functions of heparan sulfate proteoglycans
b. Roles of sphingolipid metabolism on cell death progression
c. Localization of transmembrane proteins on the plasma membrane
d. Sensing and response mechanisms of cells toward gravity

4. No clinical services

5. Publications

[Original article]

[Review article]

[Proceeding]

[Book chapter]
6. Presentation at meetings

1. Sachiko Takehara, Masaki Yanagishita, Katarzyna A. Podyma-Inoue, Masayuki Ueno, Kayoko Shinada and Yoko Kawaguchi. “Comparison of glycosylated and total salivary proteins between halitosis and non-halitosis patients”. The 8th International Conference of Asian Academy of Preventive Dentistry, November 6 - 8, 2008, Jeju, Korea


7. Invited lecture

1. Masaki Yanagishita, “Roles of nucleotide sugar transporters in the formation of extracellular matrix”. Annual Meeting for the Tumor Biology Research Group, Faculty of Medicine, University of Tromsø, September 22-24, 2008, Skibotn, Norway.
Cell Signaling

1. Staffs and Students (April, 2008)

Professor Hiroshi TAKAYANAGI
Associate Professor Toshio HONGO
Assistant Professor Masahiro SHINOHARA, Tomoki NAKASHIMA, Satoru HARUMIYA
Tokunin Associate Professor Masatsugu OHORA
Tokunin Assistant Professor Takako KOGA
Graduate Student Mikihiro HAYASHI, Abdul Alim AL-BARI

2. 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 and osteoblasts, but also on the osteoimmunology, which is a new integrated field of bone homeostasis and immunology. 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. Research Subjects

1) Function and transcriptional regulation of NFATc1, a master regulator of osteoclast differentiation
2) Transcriptome and Proteome of cytokine-induced genes
3) Regulation of bone homeostasis by immunoglobulin receptors
4) Functional analysis of genes by gene manipulations, RNAi and gene-disrupted mice
5) Development of clinical application by experimental animal disease models

5. Publications

[Original Article]

[Review Article]
2. Hiroshi Takayanagi: Bone and Immune System. Annual Meeting of Korean Endocrine Society 2008.11.8 Jeju, Korea
5. Hiroshi Takayanagi: Use of mouse genetics in bone biology and osteoimmunology. EMBO Practice Course on "Anatomy and Embryology of the Mouse" 2008.9.10, Zagreb, Croatia
Periodontology

1. Staffs and Students (April, 2008)

Professor
Yuichi IZUMI

Associate Professor
Hisashi WATANABE

Lecturer
Shigeru ODA, Satsuki HAGIWARA

Research Associate
Makoto UMEDA, Toshiyuki NAGASAWA,
Shinichi ARAKAWA, Akira AOKI,
Hiroaki KOBAYASHI

GCOE AI Supper Students
Karine Antonine, Noriko EBE,
Aleksic Verica, GA Rajakaruna,
Aslam AL Mehdi

Graduate Students
Nami HASEGAWA, Ikufumi SATO,
Tomonari SUDA, Yukiko BANDO,
Maiko FUJIMURA, Keiko TANAKA,
Hidetomo ONISHI, Norio AOYAMA,
Chie KOBAYASHI, Chihiro HARUTA,
Tatsuro KOYANAGI, Takaumi SUZUKI,
Yoichi TANIGUCHI, Mayu TERACHI,
Hiromi NANBARA, Ayae HAYAGUMO,
Akiko HIMENO, Bharti PARIKSHA

Hospital Staff:6, Research Student:21,
Registered dentist:21, Foreign researcher:3

2. Purpose of Education

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.

3. Research Subjects

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

4. Clinical Services

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

5. Publications

Original Article


Review Article


Book

Department of Bioceramics

1. Staffs and Students (April, 2008)

Professor Kimihiro YAMASHITA  
Associate Professor Akiko NAGAI  
Assistant Professor Yumi TANAKA Miho NAKAMURA  
Graduate Student Rumi OKABAYASHI Hideki SAGAWA, Yuki IMAMURA,

2. Purpose of Education

Bioceramics such as hydroxyapatite and tricalcium phosphate have been clinically applied for inorganic substitutions in orthopedic and dental field. Main objective of bioceramics in the graduate course is to provide students opportunity to study ceramic materials science such as structure and synthesis, and also study materials characterization technology. Students are also taught on investigation of osteoconductive mechanism by bioceramics.

3. Research Subjects

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) Local control of electrical space by electrovector ceramics

The electrical strength and distribution formed by electrovector ceramics are detected by materials scientific, electrochemical and crystal chemical methods. The mechanism of electrical polarization, especially the defect formation and the crystal deformation induced by fluctuation of ionic distribution in electrovector ceramics, and establishment of control technology in electrovector ceramics.

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.

4. Publications

Original Article

4. Okura T, Takahashi T, Monma H, Yamashita K. Effect of Substitution of Si with V and Mo on Ionic Conductivity of
Hard Tissue Engineering

\[ Na_5YSi_3O_{12} \text{-type Glass-Ceramics, Solid State Ionics, 179: 1291-1295, 2008.} \]


Book


Proceeding


Invited presentation


Presentation


Award
Cell Biology

1. Staffs and Students
   Professor Takao NAKATA (from July)
   Associate Professor Akihiro INOUE
   Technical Staff Satoko NAKAMURA (from January)

2. Education
   We teach cell biology II to 1st year medical students, cell structure II to 2nd year medical students, and histology to 3rd year medical students. Cell biology II deals with excitatory cells, and serves as introduction to neuroscience. In cell structure II and histology, we deal with histology of human body. The courses are composed of the 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.

3. Research
   We are now setting-up our laboratory.
Medical Biochemistry

1. Staffs and Students (April, 2008)
Professor       Yutaka Hata
Assistant Professor  Kentaro Nakagawa
Assistant Professor Mitsunobu Ikeda
Other two staffs and five students

2. Purpose of Education

1) Undergraduate

We organize “Molecular Biology and Human Genetics” and “Medical Biochemistry”. The students are requested through these courses to obtain a comprehensive integrated knowledge of human molecular genetics, to learn why the knowledge of biochemistry is important for understanding how health is maintained, and to understand which molecular and biochemical events cause human diseases and underlie the rational treatments.

2) Graduate and others

We are studying the cell adhesion-related signaling pathway, which is involved in the regulation of cell proliferation, cell polarity, and apoptosis. This pathway is well conserved from fly to human. The mutations of some 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. We give lectures about our current studies to graduate students and others, and provide graduate students with the opportunity to participate in them, so that they can be interested in this pathway, which should play an important role in various human diseases and could be a new therapeutic target.

3. Research Subjects

1) Study on RASSF proteins
2) Study on mammalian Hippo signaling
3) Study of nuclear Dbf2-related kinases

4. Clinical Services

N/A

5. Publications

Original Article

1) Threonine 74 of MOB1 is a putative key phosphorylation site by MST2 to form the scaffold to activate nuclear Dbf2-related kinase 1. Hirabayashi, S., Nakagawa, K., Sumita, K., Hidaka, S., Kawai, T., Ikeda, M., Kawata, A., Ohno, K., Hata, Y.  Oncogene 27: 4181-4192 (2008)

Section of Orthopedic Surgery

1. Staffs and Students (April, 2008)
Professor Takeshi MUNETA
Assistant Professor Young-Jin JU
Tokunin Associate Professor Ichiro SEKIYA
Tokunin Assistant Professor Tomoyuki MOCHIZUKI
Tokunin Junior Associate Professor Kunikazu TSUJI (from November)
Hospital Staff Kenji HARA, Toshiyuki MORITO
Graduate Student Masaya HAYASHI, Yuko SEGAWA, Hiroshi ASANO, Naoyuki HIRASAWA
Tomohiko TATEISHI, Masayuki SHIMAYA, Toshifumi WATANABE, Toru TAKAHASHI
Toshifumi WATANABE, Naoyuki HIRASAWA, Tomosumi HORIE, Takashi MIYAMOTO
Junya YAMAZAKI, Mika YAMAGA, Tomomasa NAKAMURA, Shigenori YAGI, Shiro SUZUKI

2. Purpose of Education

We are working with the section of Orthopedic and Neurosurgery 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. Research Subjects

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. Novel treatment strategy for cuff tear

4. Clinical Services

We are dealing with problems of lower extremities caused by sports-related injuries as well as degenerative process. We focus on the treatment with intensive conservative treatment strategy with self-performance, less invasive treatment strategy using synovial mesenchymal stem cells, double-bundle ACL reconstructions and novelly development total joint for patients with end stage knee and hip problems.

5. Publications

Original Articles


Health Promotion

1. Staffs and Students

Professor: Takehito Takano
Assistant Professor: Masashi Kizuki, Masafumi Watanabe
Tokunin Assistant Professor: Asako Igarashi (till November), Tomoko Inose (from April)
Graduate Student: Miki Watanabe, Tomoko Inose (till March), Le Thi Thu Hien (till September), Satoshi Suyama, Hemat Shafiqullah, Ayako Morita, Keoprasith Bounserth Serth, Pham Luu Hong (from October), Stephen Kibusi Mathew (from October), Chiemi Kajiwara (till March), Mari Uchimura (from April)

Research Student

2. Purpose of Education

Graduate School Programs

The objective of postgraduate education in the field of public health is to pursue professional qualifications of high caliber who exhibit leadership in the advancement of public health and promotion of health on an international scale. The department helps students attain knowledge, skills, attitude, and experiences that are necessary to become a competent public health specialist. With the expansion of the new graduate programs in the university, greater attention is now given to making commitments and contributions in the international arena. Presently, the phrase “think globally and act locally” has become a global movement. The advancement of public health demands an increase in professionals who possess a global perspective yet appreciate the importance of local activities.

[Master Programs]: Masters degree students receive a systematic intensive training that leads to the acquisitions of broad expertise in the fields of public health, immunology, and medicine of health promotion. This program now consists of students with backgrounds in various majors.

[Doctor 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. A rich variety of educational activities are arranged in the course of the program. These include, among others, individual discussion sessions with professors and other faculty members, field investigations, 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 research and confirmation on each of their progress.

[PHL (Public Health Leaders) Program]: Students in the PHL program achieve in attaining the skills required for public health professionals with an international perspective, particularly 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.

[Master of Medical Administration : MMA]: The MMA Program provides a highly leveled and broad interdisciplinary educational curriculum that prepares enrolled students for services not only as business professionals, but as qualified specialists in the field of medical administration. The classes for this program are offered during the evening hours because it is designed primarily for employed adults and others alike.

Public Health Education Program for Medical School Student

The Graduate School of Medicine aims to prepare its medical students for future careers as physicians who will recognize the societal importance of their medical services and have the ability to fulfill both the scientific and social roles of their possessions.

[International Society and Medicine]: The Medical Education at Tokyo Medical and Dental University can be broken down into three fields. They are 1) experimental, 2) clinical, and 3) social medicine. Social medicine emphasizes on the social aspects of medicine, which primarily has to do with the mechanisms of health, the occurrences of diseases, prevention methods, and the role of healthcare. It strives to identify the causes and mechanisms underlying the health problems confronting society, as well as to engineer solutions backed by a systematic and organized approach. Changes in the
modern social atmosphere of medicine and healthcare are closely linked to several changes within the international society. Furthermore, there is a rapid increase in the globalization for medicine and healthcare, which in turn, reinforces the needs for international perspectives, especially within the realm of social medicine. Lectures and tutorials are taught by instructors specialized in various fields; such as public health, medical zoology, parasitology, forensic medicine, policy research, and social psychology.

[Social Medicine]: The Social Medicine department follows the Medical Education Core Curriculum as its base, and also uses it as a benchmark study for the national examination for medical practitioners. Studies covered in this curriculum include critical issues that may or may not be new, but are relevant to the field of social medicine.

[Public Health]: The Public Health education program is comprised of courses in public health, researches on public health related topics, off-campus internships pertaining to public health, and small group seminars. The topics in the Public Health education are the following:


The courses in the Public Health education program are limited in time, and thus, cannot cover all the topics listed above in full detail. Nonetheless, in demands presented by the national exam for medical practitioners, their post-graduate research, and for their future roles as physicians, students will need to thoroughly study the subjects on their own. In addition to these and counting, there is close to one hundred different topics that can be considered as topics for student’s research papers. In this paper, each student will be expected to develop and analyze an in-depth understanding about the subject they choose from the list. As part of the research, students will gather requisite materials and documentation, conduct surveys, analyze data, and prepare reports based on their topic. Internships and participation in small group seminars involve students working in small teams to investigate common subject matters. These programs are designed to help students reinforce their ability to engage in multifaceted investigations concerning with specific problems in the field of public health. Furthermore, students are to actively pursue in independent study, apply scientific reasoning, and be able to present their reasoning and conclusions to a broader audience in a structure that is comprehensive and explicit. Classes are taught by Tokyo Medical and Dental University Graduate School professors in the field of environmental, social, and clinical medicine.

3. Research Subjects

1) Urban environments, lifestyles, and health
2) Urbanization and its impact on health in developing countries
3) Socioeconomic conditions, social inequalities, and health
4) Standards and determinants of health
5) Monitoring and evaluation of healthy cities development
6) Information technology applications in Public Health
7) The utilization of geographic information systems for Public Healthy policies
8) The measurement of disease infection risks in urban societies
9) The lifestyles and growth of children in urban areas
10) End of Life in the community healthcare system

4. Publications

Original Article


Environmental Parasitology

1. Staffs and Students (April, 2008)

Professor            Nobuo OHTA
Associate Professor   Nobuaki AKAO
Junior Associate Professor Takashi KUMAGAI
Assistant Professor   Misato TOMODA
Secretary             Mariko HATO
Graduate Student      William Koffin Anyan, Keisuke NAKAYAMA,
                      Takenori SEKI, Kei KITAMURA,
                      Bethel Kwasa-Bentum, Toshie TANIGUCHI,
                      Takashi AKIYAMA, Zongfan JIN,
                      Noriko IMAI

2. Purpose of Education

Undergraduate course: The range of disciplines represented at the section of Environmental Parasitology is very broad and inter-disciplinary research is a feature of much of our activities. There is a spectrum of diseases that could be studied and a wide range of major topics you could choose from which include: Protozoology, Helminthology, Medical Entomology, Vecto-borne Nosography and Poisonous Zoology. We have close interaction with scientists in different research teams of Tropical Medicine, International Health Care, Preventive Medicine and Public Health not only in the Division of Public Health of the Tokyo Medical and Dental University but are also in collaboration with scientists in other Universities or Institutes across Japan. The Section also has strong overseas links that provide a channel for field studies as well as international collaborations in developed and developing countries.

Graduate course: Along with the advancement and expansion of world transport systems has been an increasing human exchange across borders, and increased awareness to Medical researchers of the day that global view is an important factor for medical sciences that deal with human health development. From international perspective our eventual goal is to establish and disseminate knowledge on environmental health care based on Parasitology and deepen our relationship with developing countries.

3. Research Subjects

1) Infectious Immunity on Schistosomiasis
2) Molecular Epidemiology of Tropical Diseases
3) Pathobiological Studies on Zoonotic Helminthiasis
4) Spatial Epidemiology of Parasitic Diseases

4. Clinical Services

The section has considerable expertise in the diagnosis of human parasites and provides a service to physicians helping to diagnose parasitic infections.

5. Publications

Original Article

Review Article


Book
Forensic Medicine

1. Staff and Students

Professor Koichi UEMURA
Assistant Professor Takeshi FUNAKOSHI
Graduate Student Kyoko UCHIDA, Akina NARA, Eriko OCHIAI, Haruka NAKAYAMA

2. 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. Research Subjects

1) Toxicology
2) Alcohol medicine
3) Forensic pathology
4) Medical law

4. 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.

5. Publications

Original Article

International Health and Medicine

1. Staffs and Students (April, 2008)

Associate Professor Keiko Nakamura, MD, PhD
Assistant Professor Kaoruko Seino, MMs, PhD
Graduate Student Fujiko Yamada, MD; Dorjsuren Bayarsaikhan, MPH; Rie Nakajima, MMs; Nyambayar Khaliun, MD; Koeut Pichenda, MD, MPH; Sunsanee Mekrungrongwong, MPH; Moala Anaseini Radinakelo, Suresh Babu Munuswamy, MD, MPH

2. Purpose of Education

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.

By the end of the completion of the doctoral course, the participants are expected to be able to
• Assess health and well being of the population at local, national, and international settings,
• Assess the evidence to show effectiveness of health interventions, programs and strategies,
• Think strategically to develop local, national, and international policies,
• Manage projects leading to successful completion
• Demonstrate leadership in local, national, or international public health programs
• Communicate properly by listening, presenting, writing, and negotiating
• Pursue a full-cycle of academic public health research
• Facilitate learning of staff, students, and colleagues, and
• Practice and respect professional ethics in socio-culturally diverse environment.

Master Programs
Masters degree students receive systematic intensive training that leads to the acquisition of broad expertise in the fields of public health, immunology, and medicine of health promotion. This program is open to students who have majored in any field.

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. A rich variety of educational activities are arranged in the course of 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.

Public Health Leaders (PHL) Program
Students in the PHL program 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.

Master of Medical Administration (MMA) Program
The MMA program provides a broad interdisciplinary and high-level curriculum that prepares enrolled students for services not only as business professionals, but as qualified specialists in medical administration. The classes for this program are offered during the evening hours because the program is designed primarily for employed adults.

3. Research
The department’s major research interest is to elucidate physical, social, economic and cultural factors determining
inequity in health. The research investigates local, national and international policy and programs to redress health inequalities. The department works closely with WHO and other international agencies to help develop guidelines of scientific evaluation and recommended practices.

Major Research Topics:
1) Measuring population health to identify inequity in health and determinants thereof
2) Use of geographic information systems for evaluation of public health
3) Transfiguration of ecosystem and its interaction with human health
4) Socio-cultural factors determining health
5) Outcome and process evaluation of health development programs
6) Use of information technology to improve public health

4. Publications

[Conferences]

[Awards and recognitions]
[International collaboration programs]

[Collaboration with local and national public health programs]
1. Nakamura K. Statistics Committee, Expert Member, Cabinet Office, Japanese Government
2. Nakamura K. Member of Tokyo Metropolitan Government Urban Planning Council
3. Nakamura K. Commission on effective implementation of Healthy Cities in Ichikawa in the context of WHO Healthy Cities network, Ichikawa City
4. Nakamura K. Commission on optimal application of Healthy Cities in Owariasahi City, Owariasahi City
5. Nakamura K. Community lecture, WHO Healthy Cities Wayo-kai, Ichikawa City
6. Nakamura K. Special lecture, Japan Chapter of the Alliance for Healthy Cities, Tajimi City
7. Nakamura K. Evaluation Committee of Specific Program of Health Guidance, Ichikawa City
Oral Health Promotion

1. Staffs and Students (April, 2008)

Professor: Yoko KAWAGUCHI
Associate Professor: Norio Shimura (until March)
Junior Associate Professor: Kayoko SHINADA (from April)
Assistant Professor: Kayoko SHINADA (until March)
Hospital Staff: Masayuki UENO (from April)
Graduate Student: Tomohito YANAGISAWA (from April)
Research Student: Motoko ARIAKE

Graduate Student: Tomohito YANAGISAWA, Ryoko ITO
Sayaka YOKOYAMA, Chisato MORI
Mari OHNUKI, Takashi ZAITSU
Pham Anh Vu THUY, Patcharaphol SAMNEING
Akiko OHSHIRO, Susumu TAKEUCHI
Melissa ADIATMAN

Research Student: Sachiko TAKEHARA

2. Purpose of Education

1) Graduate School, 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, lifestyle, health policy and social condition, and can conduct innovative, academic and international research on oral health for maintaining and improving oral health.

2) Graduate School, International Oral Health Cooperation

The educational purpose is to foster dental professionals who can conduct innovative, academic and international research that can contribute to health promotion in an international society, and can work as a leader of the international health cooperation.

3) Undergraduate 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 fourth and fifth year dental students, in cooperation with other departments.

3. 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

4. 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.

5. Publications

Original article


Sports Medicine/Dentistry

1. Staffs and Students (April. 2008)

   Associate Professor       Toshiaki UENO
   Assistant Professor       Toshiyuki TAKAHASHI, Hiroshi CHUREI
   Hospital Staff            Atsushi OISHI
   Graduate Student          Chie IHARA, Shiho NAKANO, Sachiko FUJINO, Tomofumi TAKAHATA, Keisuke ABE, Atsushi OISHI
   Research Student          Kayoko YOKOTA, Naoko OTABE

2. Purpose of Education

   Sport medicine/dentistry is a branch of medical and dental sciences which deals with the clinical management of oral health of athletes and sports-active people and the safety measures of sports-related traumatic injuries and disorders. Main objective of sports medicine/dentistry in graduate course 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, 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.

3. Research Subjects

   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
   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) Relations between mastication and occlusion and brain functions

4. Clinical services

   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.

5. Publications

   Original Articles

   Review Articles

6. Presentations

stabilization of posture stance. IADR/CADR 86th general session, Toronto, Canada, July 2-5th, 2008.

thermoforming materials underwater environment. IADR/CADR 86th general session, Toronto, Canada, July 2-5th,
2008.


7. Grants and Fellowships
   1) Aquarius Grant (Japanese Olympic Committee & Coca-Cola Grant, 2008). Ueno T, Nakano S, Takahashi T,
      Toyoshima Y, Kawahara T.

8. Awards and Honors
   1) JASD Award (Japanese Academy of Sports Dentistry, 2008). Fujino S, Takahashi T, Ueno T.
Molecular Epidemiology

1. Staffs and Students (April, 2008)
Professor Masaaki MURAMATSU
Associate Professor Noriko SATO
Assistant Professor Shinobu IKEDA
Adjunct Instructor Koichi MIYAKI, Jun KANNO
Secretary Hiroko BABBA
Graduate Student Kako TAKEI, Thang OO, Koichi FUJIMOTO, Hiroshi MATSUKURA, Akiko HORI, Kohei TAMURA, Kenta FUKUSHIMA
Research Resident Yixuan SONG

2. Education
Many common diseases such as diabetes, hypertension, obesity, metabolic syndrome, and atherosclerosis are caused by multiple genetic and environmental factors. We 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. New projects to study the role of epigenetic changes in common diseases have also been started.

3. Research Subjects
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.

4. Publications
Original Article


Health Care Management and Planning

1. Staffs and Students (April, 2008)

Professor
Kazuo KAWAHARA

Graduate Student
Atsuumi KAWAUCHI Motohiro SHIMIZU
Katsumi FUJITANI Lagrada Leizel Paalan (~September)
Kofii Kouakou Alain Ahmed Mohammad Munsure
Takako SANO Kohei AOSHIMA
Hidelito TAKENAKA Youichi SHIMA
Daiske IKEDA Eiko SHIMIZU
Ayano KUNIMITSU Souichirou MOCHIZUKI
Takeo NAKADA Takeo NIGA
Sayori FUJIMOTO Mutsumi UESUGI
Kenjiro IDE Toru NAKAMURA
Sawako OKAMOTO Keiko YOSHIDA
Takashi KAWAI Ayako IDE
Research Student
Wakako KUSHIRO Yuri KINOSHITA

2. Purpose of Education

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.

3. Research Subjects

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 analyses and policy 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) Local healthcare system

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 medical 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.

4. Clinical Services
   None

5. Publications

Original Article

Review Article
   None

Book
   None
Health Care Economics

1. Staffs and Students (April, 2008)
Professor Koichi KAWABUCHI
Assistant Professor Isao IGARASHI
Graduate Student Taeko FUKUOKA, Seisuke FUKUOKA,
Tewarit SOMKOTRA, Xian Xiu LIU,
Diah Ayu Maharani, Shinichi SEKI,
Takanori TSUCHIYA, Thunthita WISAIJOHN,
Hironori INOUE, Toshifumi KAWAHARA

2. Purpose of Education
The purpose is to provide students with education and training in theoretical as well as practical approaches necessary in conducting economical analysis of various phenomena and reality found in healthcare field.

3. Research Subjects
1) Economical evaluation of heavy ion radiotherapy
2) Economical analysis of the prevention program for metabolic syndrome and counter-programs against onset and progress of age-related conditions
3) Competition and efficiency in dental care
4) Development of management index and benchmarks using DPC data
5) Comparative research between hospitals on the outcome of Acute Myocardial Infarction

4. Publications
Original Article

Review Article
Dental Education Development

1. Staff and Students
   Professor                         Ikuko MORIO
   Junior Associate Professor       Jun TSURUTA
   Graduate Student                 Daisuke MATSUYAMA (till March 2008)

2. Purpose of 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 PBL-tutorial, the students’ research project, and the electives including various English courses for dental students.

3. Research Subjects
   1) Comparative study of medical/dental education in Japan and overseas.
   2) Study of research projects for medical/dental students
   3) Development of English education programs for medical/dental students
   4) Development of multimedia teaching materials for medical/dental students
   5) Development of Japanese language learning materials for international students

4. Publications
   Original Article
Division of Research Development

1. Staffs and Students (April, 2008)
Professor Kozo TAKASE

Graduate Students
Doctor course
Yuko UCHIDA Hiromasa SAKAGUCHI
Yuji HIGASIDE Naoko MIAKE

Master course (Master of Medical Administration)
Keisuke IWASE Katsunori KUBOTA
Naoko TAKASIMA Kei YASUDA
Ayumi YAMAGUCHI Keisuke YOSIHARA
Koji IKEDA

2. Education
1) Hospital Information Management
2) Medical Informatics
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) Medical Engineering special program with Tokyo Institute of Technology
8) Health Promotion Policy program (General Medicine, Risk Management in Medicine) with Hitotsubashi University

3. Research Subjects
1) Development of Medical Information System
2) Introduction of Clinical Pathway in hospital
3) Medical law suit and professional information
4) Quality management of medical law suit
5) Organizational logic for hospital
6) Health care policy and rational
7) Management of medical information and privacy
8) Safety management in dental practice

4. Clinical Services
Department of Medical Informatics in University Hospital
Logistics management in University Hospital
Information Safety in the University

5. Publications etc.
<All publications written in Japanese>
Health Care Informatics

1. Staffs and Students (April, 2008)

Associate Professor  Kiyohide FUSHIMI
Graduate Student  Hidenori IMAI, Sayuri SHIMIZU, Shinobu KAMATA, Hiroyo KUWABARA, Takahiro INOUE
Emi SATO, Daisuke SATO, Chihiro TAKAHASHI, Ayako ODA

2. Purposes of Education

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

3. Research Subjects

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.

4. Publications

Original Article
Educational System in Dentistry

1. Staffs and Students (April, 2008)
   Professor            Kouji ARAKI
   Junior Associate Professor (non-full time)
                  Hiroki KATAOKA
   Secretary            Satomi ITOH
   Graduate Student    Yuriko YASUKAWA  Teruyo KUROSA

2. Purpose of Education
   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.

3. Research Subjects
   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

4. Clinical Services

5. Publication
   Original Article
Gerodontology

1. Stuff and Students (April, 2008)

Professor: Hiroshi Uematsu
Associate Professor: Tsuneto Ohwatari
Lecturer: Ken-ichi Kobayashi, Toshiaki Sekita
Research Associate: Kazuo Motomura, Akiko Kojyo, Ayako Nakane, Kentarou Kunimori, Shino Murata, Shinya Mikushi

2. Purpose of 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. Research Subjects

1) Medical management during dental treatment in elderly patients
2) Dysphagia screening
3) Evaluation method of eating disorders and dysphagia
4) Dental approach to dysphagia
5) Coordination of mastication and swallowing
6) Addressing dysphagia during house visits

4. Clinical Services

We manage the outpatient special care and the outpatient dysphagia rehabilitation.

1. Outpatient special care for department elderly:

Comprehensive dental treatment is given to patients who are 65 years and older with diseases spanning multiple specialties. We work together with outpatient specialty departments for complicated cases. Since many of our patients are elderly individuals with cardiovascular disease, in order to carefully manage their overall medical condition, we measure oxygen saturation with a pulse oximeter, perform electrocardiography, and monitoring a blood pressure at the time of their dental treatment. We perform invasive treatments under controlled monitoring by a specialist and take extra safety measures. In addition to providing treatment, we hold consultations before treatment and carry out highly predictable safety management.

2. Outpatient dysphagia rehabilitation:

Patients in this department are mainly inpatients from hospitals affiliated with a medical school or an oral surgery department. For inpatients from oral surgery departments, we conduct the examination and training. For inpatients of our hospitals, we work together with the hospital’s physical therapy department. We organize collaboration with these physical therapy and oral surgery departments, and accept about 100 to 150 cases from these departments. With the opening of the new outpatient department, we have received more and more requests from pulmonary, gastroenterology, and head and neck outpatient departments, as well as general medicine clinics and telephone consultations. For each case, we provide continuous guidance not only to the patients but also to associated workers and family members. Furthermore, we help introduce examination and training methods upon requests from other medical institutions that wish to practice dysphagia rehabilitation.

5. Publications

Original Article

1. Screening Test for Silent Aspiration at the Bedside.
   Yoko Wakasugi1, Haruka Tohara1, 2, Fumiko Hattori3, Yasutomo Motohashi4, Ayako Nakane1, Shino Goto1,
Yukari Ouchi1, Shinya Mikushi1, Syuhei Takeuchi1 and Hiroshi Uematsu1 Dysphagia 23:364-370, 2008
1. Staffs and Students

Professor Masanobu KITAGAWA
Assistant Professor Morito KURATA, Kouhei YAMAMOTO
Labolatory Technician Sachiko SEKI, Miori INOUE
Technical Assistant Sachiko ISHIBASHI
Graduate Students Masahiro KOYAMA, Emiko SUGAWARA,
Shiho SUZUKI, Shigeaki UMEDA,
Nobuo KUNINAKA, Yuko MOCHIMARU,
Satoshi ASANO

2. Purpose of Education

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).

3. Research Subjects

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

4. Publications

Original Article

Book・Review Article
3. Utsuyama M, Kikuchi Y, Kitagawa M, Hirokawa K. Age-related changes in subpopulations of peripheral blood

Integrated Pulmonology

1. Staffs and Students (April, 2008)

Professor Yasuyuki YOSHIZAWA
Junior Associate Professor Naohiko INASE
Assistant Professor Yosio OHTANI, Yasunari MIYAZAKI,
Meiyo TAMAOKA, Masashi FURUIE
Research Student Jin KURAMOCHI, Torahiko JINTA,
Keiko MITAKA, Koji TAKAYAMA,
Haruhiko FURUSAWA, Takehiko OHBA,
Koji UNOURA, Makito YASUI,
Hiroshi ONO, Kaori OKAYASU,
Tomoya TATEISHI, Ryutaro SHIRAHAMA,
Satoshi TAKAYAMA

2. Purpose of Education

Integrated pulmonology is a branch of internal medicine which deals with a variety of pulmonary diseases including tumors, infectious diseases, allergic diseases, non-allergic inflammatory diseases, and genetic disorders. The main objective of integrated pulmonology 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.

3. Research Subjects

1) Pathogenesis of hypersensitivity pneumonitis and detection of environmental causative antign
2) Airway remodeling in bronchial asthma model
3) Acute exacerbation in pulmonary fibrosis
4) Proteomics of pulmonary fibrosis associated with collagen vascular disease
5) Pathogenesis of pulmonary fibrosis and emphysema

4. Clinical Services

Integrated pulmonology 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, support for ceasing smoke, management of sleep apnea, and arrange of clinical studies are provided.

5. Publications

Original Article

Review Article

Geriatrics and Vascular Medicine

1. Staffs and Students (April, 2008)
Professor Kentaro SHIMOKADO, MD
Junior Associate Professor Eiji KANEKO, MD
Assistant Professor Akio KAWAKAMI, MD
Hospital Staff Yasuko ABE, MD, Masumi AI, MD.
Graduate Student Daisuke IIZUKA, Haruaki ITAKURA, Takashi KUBO, Yusuke KOMI, Hideki TATSUKAWA, Sumihiko HAGITA, Yasuko ABE, Yasuko USHIO, Mizuki IWAMA

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

3. Research Subjects
1) Cell biological mechanisms of atherogenesis
2) Mechanisms involved in dyslipidemia
3) Mechanisms of aging and age-related diseases
4) Development of new diagnostic procedures and treatments of atherosclerosis

4. Clinical Services
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.

5. Publications
Original Article
Vascular and Applied Surgery

1. Staffs and Students (April, 2008)

Professor
Associate Professor  Tatsuyuki KAWANO
Tokunin Associate Professor  Masatoshi JIBIKI
Junior Associate Professor  Yoshinori INOUE
Assistant Professor  Kagami NAGAI, Norihide SUGANO,
                    Tetsuro NISHIKAGE,
Tokunin Assistant Professor  Toshifumi KUDO
Hospital Staff  Kazuo OGIYA, Hiroaki TERASAKI,
                Tkakahiro TOYOFUKU, Shigeo HARUKI,
                Hiroyuki NOTANI, Akihito MITSUOKA,
                Tomoyoshi SUZUKI, Akihiro HOSHINO,
                Yutaka MIYAWAKI, Hidetoshi UCHIYAMA
                Shinya KOIZUMI, Koji YONEKURA
Secretary  Yuri ENDO, Kae YOSHIZAWA
Graduate Student  Rieko NAKAJIMA, Hiroaki TERASAKI,
                 Mime ASAHINA, Takahiro TOYOFUKU,
                 Shigeo HARUKI, Hiroko KUME,
                 Hiroyuki NOTANI, Akihito MITSUOKA,
                 Tomoyoshi SUZUKI, Akihiro HOSHINO,
                 Yutaka MIYAWAKI, Hidetoshi UCHIYAMA,
                 Shinya KOIZUMI, Koji YONEKURA,
                 Nuttawut SERMSATHANASAVAD,
                 Tuerxun REXIATI
Research Student  Dilixiati JIAMALI

2. Purpose of Education

This department started as the First Department of Surgery of TMDU, and many surgeons and researchers in various specialties have since achieved and have maintained a high level of activity. Our educational goals are to assist the post-graduate physicians to develop into excellent surgeons and to contribute to the development of medical/surgical sciences. Surgeons with high-level medical knowledge and techniques are expected to thrive in this department. Moreover, the department strives to nurture the humanity of the surgeon as well. The department has a peaceful atmosphere and stands as a symbol of active work in solving difficult medical problems.

3. Research Subjects

1) Development of esophago-gastric surgery.
2) Development of vascular and transplantation surgery.
3) Development of colo-rectal surgery.
4) Development of breast and endocrine surgery.

4. Clinical Services

The primary clinical services provide the diagnosis and treatment for esophago-gastric and vascular diseases. Post-graduate students learn and study general surgery and an associated sub-specialty, e.g. esophageal surgery, vascular surgery. The clinics are expensive and the department provides a full spectrum of standard and special technologies such as minimally invasive surgery and extended radical surgery for various malignancies.

5. Publications


Rehabilitation Medicine

1. Staffs and Students (April, 2008)

Associate Professor  Sadao MORITA
Graduate Student  Kiyoshi SAKATA, Kohsei SON, Kazuhisa INOUE, Akihito KUBOTA, Tomoko ARAKI, Junya AIZAWA, Keisuke KAJI, Tomokazu MASAOKA

2. 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. Research Subjects

1) 3-dimention motion analysis in activities of daily living
2) Balance and occlusion
3) Biomechanical analysis of artificial limb
4) Prevention of dislocation after total hip arthroplasty
5) Prevention of disuse bone atrophy

4. Publications

Original Article


General Dentistry

1. Staffs and Students (April, 2008)

Graduate Student

Syuhei NAKAMURA, Risa TAMURA, Kazunobu SANO, Hirono KIKUCHI, Sachi UMEMORI

Oral Diagnosis and General Dentistry

Chief
Shiro MATAKI
Associate Professor
Ikumi SHIOZAWA
Lecturer
Chie SHIMIZU, Satoko OHARA
Assistant Professor
Hideya HAMANO, Kenichi TONAMI, Atsushi OHYAMA
Hospital Staff
Tomohiro ISHIDA, Fumihiko TAKAHASHI, Kaori HARADA, Akiko TAKASHIMA, Ayaka INAKAZU

2. Purpose of Education

General Dentistry is a branch of dental science which deals with oral diagnosis and general dentistry. Education objective of General Dentistry is to acquire comprehensive patient care methods from medical interview to periodic maintenance after dental treatment. Therefore, General dentistry provides practical training course of medical interview, oral examination, oral diagnosis, writing dental records, and simulation education.

3. Research Subject

1) Study on Implementation and assessment of new dental clinical education systems
2) Study on application of ArF excimer laser to teeth preparation
3) Study of oral appliance therapy in obstructive sleep apnea
4) Study on dentin tensile strength and matrix collagen
5) Study on diagnostic system of dental caries using digital images

4. Clinical Services

In our dental hospital, most new patients consult dentists in our clinic of general dentistry and oral diagnosis to receive suitable treatment for their chief complaints. Dentists of our clinic decide where to refer each case for the optimal clinic in our hospital for their needs. If new patient is suitable for treatment in general dentistry, dentists of our clinic ask them to receive treatments from students or residents.

Clinic of general dentistry and oral diagnosis also provides patient-centered general practice, oral care by dental hygienists, and oral appliance therapy of obstructive sleep apnea syndrome (OSAS).

5. Publications

Head and Neck Psychosomatic Medicine

1. Staffs and Students (April, 2008)

Professor Akira Toyofuku
Assistant Professor Satoshi Ishida
Hospital Staff Junya Ogami Tatsuya Yoshikawa
Graduate Student Miho Takenoshita Yuuichi Kato
      Tomoko Sato

2. Purpose of 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 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.

3. Research Subjects

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

4. Clinical Services

We take charge of “Head and Neck Psychosomatic Medicine 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 7000 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. Publications
Original Article

Abstract
Behavioral Dentistry

1. Staffs and Students (April, 2008)

Professor
Shiro Mataki

Associate Professor
Hiroshi Nitta

Graduate Student
Fumihiko Takahashi Keiko Kondo
Tohru Ozaki Yuji Ito

2. Purpose of Education

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. Research Subjects

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) Dental treatment for sleep apnea and hypoapnea syndrome
5) Application of behavioral science to dental clinic

4. Clinical Services

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.

5. Publications

Original Article


Temporomandibular Joint and Occlusion

1. Staffs (April, 2008)

Associate Professor Koji KINO
Assistant Professor Akira NISHIYAMA
Hospital Staff Michiko TAKAOKA, Takenobu OHTA, Kaori TUKAGOSHI

2. Purpose of Education

Purpose of education for students and residents in this course is to provide an opportunity to learn basic knowledge on diagnostic and therapeutic procedures for temporomandibular diseases. In special course for graduate students and under graduate students, we instruct statistical techniques especially with the multi variate analysis by using clinical data acquired from patients with temporomandibular disorders (TMD).

3. Research Subjects

1) Development of multidimensional evaluation system for etiological factors of TMD
2) Influence of patients' psychosomatic factors for TMD
3) Sleep bruxism: its etiology, influence and treatment
4) Effectiveness of physiological therapy for TMD
5) Mechanisms of occlusal discomfort

4. Clinical Services

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.

5. Publications

Original Article
Laboratory Medicine

1. Staffs and Students (April, 2008)
Professor Nobuo NARA
Associate Professor Shuji TOHDA
Research Associate Mai ITOH
Graduate Students Lu FU, Noriko KAWAGUCHI, Yuki OKUHASHI

2. Purpose of Education
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.

3. Research Subjects
1) Mechanism of abnormal growth of acute leukemia cells
2) Molecular diagnostic tests for cancer and infectious diseases
3) Detection of minimal residual leukemia or lymphoma cells

4. Clinical Services
We are developing new diagnostic methods collaborating with various clinical departments. We are also supporting them in their diagnostic procedure.

5. Publications
Original Article
Critical Care Medicine

1. Staffs and Students (April, 2008)

Professor Takasuke IMAI
Associate Professor Chieko MITAKA
Assistant Professor Yasuaki NAKAJIMA (Critical Care Medicine) (2005.7.1〜)
Kenro KAWADA (Intensive Care Unit) (2007.4.1〜)
Naoki TSUCHIDA (Intensive Care Unit) (2008.3.1〜2009.3.31)
Trainee Toshiya MOMOSE (Intensive Care Unit) (2006.5.1〜2008.10.31)
Hirokazu NAGASAKI (Intensive Care Unit) (2008.11.1〜)
Graduate Students Kazuya HIRABAYASHI, Chenging ZHU, Aishan BILALI
JSPS Postdoctoral Fellowship for Foreign Researcher
   Gabriela Spasova Georgieva (2006.9.21〜2009.3.31)

2. Purpose of Education

Undergraduate education
Lectures: Fourth-year medical students
1) Shock (Imai)
2) Resuscitation (Ootomo)
3) Mechanical ventilation (Mitaka)
4) Burn (Aikawa, Keio University)
5) Acute respiratory failure (Imai)
6) Treatment of trauma (Ootomo)
7) Sepsis (Imai)
8) Hypothermia (Maekawa, Yamaguchi University)
9) Acid base balance/Chronic respiratory failure (Mitaka)
10) Pathophysiology and treatment of acute respiratory failure (Imai)
11) Traumatology (Ootomo)
12) Examination of critical care medicine

Clinical clerkship III: 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 check clinical data every morning and evening and make system-oriented presentation at ICU rounds.

Conference: Students are assigned to read recent articles of critical care medicine and make presentations by power point at the conference.

3. Research Subjects

1) Treatment and prevention of ischemia/reperfusion injury of lung
2) Relationship between high tidal volume ventilation and remote organ injury
3) A selective inhibitor for inducible NO synthase in endotoxic shock
4) Blockade of NF-κ B activation in endotoxic shock
5) Treatment of septic shock by inhibition of (ADP-lipose) synthetase
6) Clinical study of atrial natriuretic peptide

4. Clinical Services

Critical care medicine provides intensive care and treatment of critically ill patients. The role of intensivists take charge treatment of critically ill patients in the ICU. 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 attending physicians. The purpose of critical care medicine
is to treat and improve the serious condition by maintaining the patients’ hemodynamics to be stable. 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, abnormal electrolyte, acute kidney injury, central nervous system dysfunction, and hospital-acquired infection, mechanical ventilation, pharmacological support, cardiopulmonary support system, blood purification, and nutrition support.

5. Publications

[Original Article]


4. Chieko Mitaka, Yumi Fuji, Yasuaki Nakajima, Kenrou Kawada, Takasuke Imai. Polymyxin B-immobilized fiber column hemoperfusion has the possibility to reduce endothelial activation in patients with septic shock. Society of Critical Care Medicine’s 37th Critical Care Congress, Hawaii Convention Center, Honolulu, Hawaii, USA, Feb 3, 2008


Liaison Psychiatry and Palliative Medicine

1. Staffs and Students (April, 2008)

Associate Professor  Eisuke MATSUSHIMA
Junior Associate Professor  Kenji ODA,
Assistant Professor  Kenji ODA,
Tokunin Assistant Professor  Ai TAKEUCHI,
Hospital Staff  Motonori KIMURA,
Secretary  Kyoko CHIGIRA
Graduate Student  Ayako MATSUDA,  Toshiyuki MARUTANI,
  Aya KOIZUMI,  Hinako MURATA,  Mai MOTOSHITA,  Kazuho HISAMURA,
  Mika KOBAYASHI,  Ai TAKEUCHI,  Keiai SAI,  Toshiyuki MARUTANI,
  Noriyuki KINOSHITA,  Yohko NAKAJIMA,  Ayako MATSUDA,  Naoyuki NAKAYAMA,
  Hirofumi NAKAMURA,  Chieko KANAI,  Makiko KIYOKI,  Keiai SAI,
  Ako HANEKAWA,  Mare NISHIURA,  Mariko KOBAYASHI,  Miho MIYAJIMA,
  Naoko TUJI,  Tsuguo IWATANI,  Yuhko KOHNO,  Nao NAKAYAMA,
  Michi BABA.
Research Student  Okihiko AIHARA,  Ryuho IBARAKI.

2. Purpose of Education
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.

3. Research Subjects
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 psychosomatic 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)

4. Clinical Services
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.

5. Publications
Original Article


Pharmacokinetics and Pharmacodynamics

1. Staffs and Students (April, 2008)
Professor Masato YASUHARA
Graduate Student Yutaka TAKAHASHI, Tohru ARINO, Yuko KOJIMA

2. Purpose of Education
Department of Hospital Pharmacy, University Hospital of Medicine, 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 and drug transport will be given. Students will have the practice of pharmacokinetic analysis and animal experiments.

3. Research Subjects
1) Investigation on the membrane transport of drugs
2) Kinetics of drug action in disease states
3) Therapeutic drug monitoring and clinical pharmacokinetics
4) Development of new drug delivery systems

4. Clinical Services
Department of Hospital Pharmacy provides all services about the pharmacotherapy, including dispensing, formulation, preparation of injections and infusion solutions, drug information, and therapeutic drug monitoring.

5. Publications
Original Article
General Medicine

The Department of General Medicine was established in 2000, when Professor 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 introduced in the department of medicine and its affiliated hospital in order to promote advanced medicine in our university. Accordingly, we launched the following projects to meet this prime objective: 1) a postgraduate clinical training program over the network of TMDU affiliated hospitals, 2) a patient support system including social casework, 3) the Center for Cell Therapy, and 4) the reform of undergraduate medical education. In response to the expansion of our activities, we have had some organizational changes. 1) The Center for Postgraduate Education was founded in 2002. The members belonging to this center were Prof. Yujiro Tanaka, Dr. Atsushi Okawa, and Dr. Masanaga Yamawaki. 2) In 2002 the Center for Health and Welfare was also established, and two years later in 2004, it separated from the Department of Medicine when Dr. Masayoshi Shichiri was appointed as the Director of the center. 3) The Center for Cell Therapy, which was first established as a part of the Blood Transfusion Department of the hospital in March, 2001, became an independent department in 2003 and Dr. Tomohiro Morio became the chair of the center. 4) Prof. Tanaka became a member of the Board of Education and worked on the committee for curriculum improvement in the department of medicine. He became the chair of the Education Committee from 2004. In addition to the basic design of the new curriculum, this department has been in charge of early clinical training, PBL implementation, training in medical interview techniques, 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. On the other hand, new sections were established in the department. The Working Group for Ward Management (Tanaka, Yamawaki) and the Safety Management Committee (Okawa) were set up in 2004. The Department of General Medicine also worked on the development of an evaluation system for the residency training program (EPOC), and later this became a national online evaluation system for postgraduate clinical training.

1. Education

As a division responsible for the education of students and residents, our chief aim is to foster doctors who have both a ‘patient-centered perspective as a specialist’ and ‘up-to-date knowledge as a generalist’. To achieve these aims, we are designing and offering a continuing medical educational (CME) program for clerkship students, with its emphasis put on educational systems that span multiple departments. Since we think it is important to foster a patient-centered perspective in medical professionals, 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”, which are designed to meet 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, in cooperation with the International Center for Medical Education at the University of Tokyo. To improve the quality of clinical training, we are also currently working with an evaluation system for tutors and trainers.

Our department has offered 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, 2009 showed the highest satisfaction rate among universities nationwide in the past three years (124 residents in 2006 (full match), 123 in 2007 (full match), 115 in 2008 (full match)).

2. Research

In the field of research, we are carrying out projects including:

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-graduate clinical training are ongoing.
Research on medical education with SPs (Yamawaki)

We developed a training course based on simulated patients (SPs) through collaboration with the University of Tokyo. In cooperation with SPs, we are performing research on the educational effects of simulation on clinical techniques such as medical interviewing and physical examination, as well as clinical reasoning.

A comprehensive study of dysphagia and inter-professional education (IPE) of its treatment (Yamawaki)

Dysphagia is common worldwide. We are conducting research on educational systems for its treatment for medical professionals in other fields, so-called inter-professional education (IPE), as well as quantitative risk analysis using HAZOP. In addition, clinical research and basic research are carried out in collaboration with domestic and foreign facilities.

Randomized control trial for the surgical treatment of lumbar hernia (Okawa)

Since RCTs for surgery are not easy, the advantages and disadvantages of many surgical techniques remain unclear. In this study, one of three operative procedures was selected randomly for patients with lumbar hernia, who will be followed for 10 years to evaluate outcomes and improve prognosis.

Medical risk education using the HAZOP method - through analyzing basic surgical procedure (Okawa)

Structured risk analysis methods, HAZOP, are applied for medical risk management. We have also developed computer software for risk analysis with HAZOP. As a method of medical education for medical risk as well, HAZOP is a comprehensive method that is effective in reducing medical errors.

Review of clinical training in postgraduate clinical education (Tanaka, Okawa, Yamawaki)

The performance evaluation system using EPOC, which is used in 60% of educational hospitals in Japan, was primarily developed at Tokyo Medical and Dental University. We applied this system to a clerkship program to compare its educational effect with that of a residency program.

General study on medical education (Tanaka, Okawa, Yamawaki, Momohara)

We are developing a comprehensive research project about postgraduate medical education, primary care in rural regions, development of clinical competence, and a new PBL system.

3. Clinical Practice
Second Opinion (Okawa)

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 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 a network of specialists in TMDU.

Patient Safety (Okawa)

Dr. Okawa 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.
Acute Critical Care and Disaster Medicine

1. Staffs and Students (April, 2008)

Professor             Yasuhiro OTOMO
Junior Associate Professor  Eiji ISOTANI,  Junichi AIBOSHI
Assistant Professor              Masahito KAJI,  Tomohisa SHOUKO,
                                         Naoki TOSAKA,  Atsushi SHIRAISHI,
                                         Yutaka SEKI,  Kiyoshi MURATA,
Graduate Student         Koji MORISHITA

2. 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.

3. 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 subarachnoid hemorrhage and cerebral apoplexy on acute phase

4. 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.

Publications

Original Article

Neuroanatomy and Cellular Neurobiology

1. Staffs and Students (April, 2008)

Professor Sumio TERADA
Assistant Professor Masahiko KAWAGISHI, Mitsunobu HOSHINO
Technician Mie TAGUCHI
Graduate Student Hiroaki HORIZ

2. Purpose of Education

Section 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, we offer introductory courses on both optical and electron microscopy (Lectures and Wet labs), with close relation to molecular and cellular neurobiology.

3. Research Subjects

1) Molecular mechanism of intracellular transport, quality control of transporting cargos, and their interrelation (Slow axonal transport and neurodegeneration)
2) Development of a real-time detection system of the biomolecular network in vivo and its application to cell biology
3) Molecular and cellular biological analysis of neuron-specific small G proteins
4) Development of new spectroscopic methods to visualize the localization of biomolecules without fluorescence labeling
5) Search for new cellular morphological regulatory factors on cytoskeletal dynamics
6) Functional image analysis on neuropsychiatric disorders

4. Publications

Original Article

1. Staffs and Students
Professor Yoshikazu Shinoda (~2008.3)
Associate Professor Izumi Sugihara
Lecturer Yuriko Sugiuchi
Assistant Professor Yoshiko Izawa
MD-PhD Course Graduate Student Mayu Takahashi (~2008.3)

2. Education
“Basic Neuroscience” course, which our department participates in, consists of integrated lectures and laboratory works of neuroanatomy, neurophysiology and neuropharmacology. The goal of this course is for the students to understand the pathophysiological states of the central and peripheral nervous systems caused by various diseases, based on understanding of normal functions of the nervous system. The neurophysiology part of the course covers wide varieties of topics from the sensory system (somatosensory, visual, auditory), voluntary motor control system (motor cortex, cerebellum, basal ganglia), spatial orientation (vestibular, visual) and postural reflex. A hand-made computer simulation program has been developed for students to self-learn basic matters such as generation and transmission of excitation in nerve cells.

3. Research
Our main interest is on neural mechanisms of motor control. We analyze neural networks of the central nervous system (mainly the cerebellum, brainstem and cerebrum) for controlling initiation and cessation of various kinds of eye movements by combining morphological, electrophysiological, and cell-biological method.

Morphology and function of neural networks for motor control in the central nervous system
1) Neural mechanism of eye movement control
An animal fixates on interesting target by moving its eyes and head. This eye-head coordination system is very interesting as a model of motor control in the central nervous system of higher mammals. To determine the direction of the gaze, target position in the retina should be detected first and then transformed into motor signals for eye and head movements, the process of which is considered to be executed via the occipital, parietal, and frontal cerebral cortices. Understanding of these neural mechanisms of signal transformation in eye and head movement systems will also open up a door to understanding the mechanism of limb-movement control in general. To understand the mechanism of this signal transformation in eye movement system, we analyze neural mechanisms of signal transformation from the superior colliculus (center for rapid gaze shifts) to the brainstem, the midbrain, and the spinal cord using electrophysiological and morphological methods. Furthermore, we analyze eye movement systems from the frontal and parietal cortices to the superior colliculus and the brainstem. So far we have identified a localized area involved in inhibiting saccade (rapid eye movements) initiation in the frontal eye field in the monkey, and characterized properties of activity of neurons there. We also have found an area in the frontal cortex receiving strong vestibular inputs, which shows that the head movement signal contributes to eye movements.

2) Cerebellar function in generation and control of voluntary movements
A neural network that consists of the loop-shaped connection among the cerebrum-precerebellar nuclei-cerebellum-thalamus-cerebrum is important for initiation, execution and control of movements. At the moment we are focused on the input/output connections within this loop. By using electrophysiological recording and extracellular microinjection technique, we systematically analyze single-axonal and topographic projection patterns of various input systems from the brainstem and the spinal cord to the cerebellum and also output systems of the cerebellum. Analysis of such projection patterns revealed the structural and functional correlations of cerebellar input/output systems (climbing and mossy fiber systems and Purkinje cell axons) with the compartmentalization (microzone) of the cerebellar cortex and nuclei that was determined by different expression of marker molecules such as aldolase C.

4. Publications
Original Articles
1. Sugihara I, Fujita H, Na J, Quy PN, Li BY, Ikeda D : Projection of reconstructed single Purkinje cell axons in...
relation to the cortical and nuclear aldolase C compartments of the rat cerebellum. *J Comp Neurol.* 512: 282-304. (Published Online: 10 Nov 2008)


Department of Ophthalmology and Visual Science

1. Staff and students (April, 2008)

Professor; Manabu Mochizuki
Associate Professor; Kyoko Ohno-Mastui
Assistant Professor; Sunao Sugita, Yoshiharu Sugamoto
Hospital staff; Akiko Tanaka, Takeshi Yoshida, Hiroshi Takase, Kouju Kamoi
Graduate student; Qinggeletu, Noriaki Shimada, Shintaro Horie, Jiying Wang, Yukiko Yamada, Kengo Hayashi, Megumi Shimizu, Manabu Ogawa

2. Purpose of education

Ophthalmology and Visual Science deals with the eye. 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. 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.

3. Research subjects

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.
5) 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
6) Mechanism of visual pathway in normal conditions as well as in the patients with amblyopia.
7) Development of a novel treatment for vitreoretinal disorders like retinal detachment, diabetic retinopathy, and macular holes.
8) Analysis of retinochoroidal complications in high myopia (choroidal neovascularization, myopic tractional retinopathy)
9) 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)
10) Gene analysis of highly myopic patients (collaborator project with Kyoto University)
11) Establishment of a novel therapy to prevent an axial elongation or the formation of posterior staphyloma
12) Development of new materials for contact lens, the development of a novel drug delivery system using contact lens
13) Effect of the visual background on binocular vision as well as the influence of strabismus on dynamic visual acuity.

4. Clinical services

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 uveitis clinic, retinal detachment clinic, diabetic retinopathy clinic, neuro-ophthalmology clinic, high myopia clinic, and medical retina clinic.

Approximately, 1,100 surgeries are performed per year (e.g., cataract surgery, vitreoretinal surgery, glaucoma surgery, strabismus surgery).

5. Publications

[Original Article]


[Review Article]

[Presentation]


9. Shimada N, Ohno-Matsui K, Yoshida T, Sugamoto Y, Tokoro T, Mochizuki M. Progression from macular retinoschisis to retinal detachment in highly myopic eyes is associated with outer lamellar hole formation. 31st World Ophthalmic Congress, Hong Kong, 6.28.2008.


[Invited lecture]


4. Mochizuki M. Progress in the nomenclature of ocular sarcoidosis. 7th International Symposium on Uveitis, Constance (Germany), 2008.9.9.

5. Mochizuki M. Role of RPE in regional immunity in the eye. 7th International Symposium on Uveitis, Constance (Germany), 2008.9.11.


Oto-Rhino-Laryngology

1. Staffs and Students (April, 2008)

Professor: Ken KITAMURA
Associate Professor: Atsunobu TSUNODA
Assistant Professor: Yasuhiro SUZUKI, Taku ITO, Yoshiyuki KAWASHIMA, Kazuchika ONO, Yousuke ARIIZUMI

Hospital Staff: Taro SUGIMOTO, Yoshihiro NOGUCHI, Akemi IWASAKI, Yuji NAKAMURA, Koji HAGINO, Takao TOKUMARU, Naoto TAKAHASHI

Research Student: Yoshimi TAMEKUCHI, Katsura YAMAMOTO

2. Purpose of Education

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 third clinical clerkship, 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. Research Subjects

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
6) Treatment of tinnitus
7) Treatment using endoscope

4. Clinical Services

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, dizziness, otitis media, tumor, deafness, and tinnitus clinic.

5. Publications

Original Articles


Conference Presentations

Invited Lectures
Molecular and Cognitive Neuroscience (Molecular Neuroscience)

1. Staffs and Students (April, 2008)
   
   Professor Kohichi Tanaka
   Associate Professor Hiroko Ohki-Hamazaki
   Assistant Professor Okiru Komine
   Assistant Professor Tomomi Aida
   Assistant Professor Yasuyuki Shiobara

2. Purpose of Education
   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.

3. Research Subjects
   1) Functions of glutamate transporters in the brain.
   2) Role of Notch-dependent and –independent RBP-J signaling pathway in the cerebellar development.
   3) Neural basis for memory and learning during infancy.
   4) Regulation of sexual differentiation of the brain and behavior.

4. Publications
   
   Original Article
1. Education

Our objectives of education are to analyze mechanisms of various diseases. Graduate students, research students, and medical doctors are educated by carrying out various kind of animal experimental models.

2. Research Subjects

1) Investigation of the mechanisms regulating vascular remodeling
2) Investigation of benign prostate hypertrophy and research/development of novel drugs
3) Investigation of the mechanisms of the erectile dysfunction and urinary obstruction
4) Investigation for the development of intelligent stent
5) Analysis for mechanism(s) of complication caused by smoking with using novel animal model.
6) Research about pulmonary circulation

3. Publications

Original Articles


4. Proceedings

Pharmacology and Neurobiology

1. Staffs and Students (April, 2008)
Professor Tsutomu TANABE
Assistant Professor Hironao SAEGUSA, Takashi KURIHARA, Shuqin ZONG
Graduate Student Li LI, Eri SAKURAI

2. Purpose of Education
2-1
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.

2-2
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.

3. Research Subject
1. Molecular basis of calcium channelopathy
2. Molecular mechanism of neurodegenerative disease
3. Mechanism of modal shift of cell sensor: from touch perception to pain sensation
4. Molecular mechanism of neuropathic pain
5. Molecular mechanism of drug tolerance
6. Hormonal modulation of stem cell development

4. Publications
International meeting:
Neurology and Neurological Science

1. Staffs and Students

Professor
Hidehiro Mizusawa

Associate Professor
Takanori Yokota

Junior Associate Professor
Kinya Ishikawa

Assistant Professor
Nobuo Sanjo, Hiroyuki Tomimitsu, Mutsufusa Watanabe, Takashi Irioka (~September), Satoru Ishibashi (October~)

Hospital Staff
Yuichi Fumimura, Masaki Kobayashi, Ayaka Yamanami, Kokoro Ozaki, Maya Ohara, Takaaki Hattori
Senior Resident
Yoshiyuki Numasawa
Post-doctorial Fellow
Takayuki Kubodera, Takeshi Amino
Graduate Student
Osamu Tao, Hirotaka Sasaguri, Nozomu Sato, Masaki Hidume, Taro Ishiguro, Kenji Ishibashi, Yoshitaka Uno, Toshiro Kanazawa, Tamako Misawa, Miho Akaza, Xu Han Yan, Mayra Azat, Jin Hai Feng, Zen Kobayashi, Hiroya Kuwahara, Makoto Takahashi, Piao Wen Ying, Toshiki Unno, Masato Ohbayashi, Yusuke Niimi, Masaki Kobayashi, Takumi Hori, Takaaki Hattori, Yuki Yamamoto, Azusa Watanabe

2. Purpose of Education

Neurology is a medical specialty concerned with the diagnosis and treatment of disorders of the nervous system including the brain, spinal cord, peripheral nerve, autonomic nerve and skeletal muscle. Since the nervous system is distributed the whole body and regulate all the organs, neurologists have to examine and understand many symptoms of the whole brain and body.

Department of Neurology and Neurological Science at Tokyo Medical and Dental University offers the unique “clinical neurological training for specialists” in a four-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 investigation such as electrophysiology, neuromuscular pathology, neuroimaging, or neurobiology and so on. The faculty and staff are committed to facilitating resident education and training.

After completion of their training for four years, senior residents are provided with a lot of clinical experience as attending doctors or teaching assistants in the university hospital and the affiliated hospitals. They will be eligible for the certification board by the Japanese Society of Neurology.

3. Research Subjects

1) Gene identification and investigation of pathomechanisms of hereditary diseases such as spinocerebellar ataxias
2) Development of gene therapies using RNAi
3) Basic and clinical researches for neurodegenerative diseases such as spinocerebellar ataxia, amyotrophic lateral sclerosis, Parkinson’s disease and Alzheimer’s disease
4) Development of neuroregenerative therapy using stem cells for cerebrovascular diseases and neurodegenerative diseases
5) Basic and clinical researches of neurological autoimmune diseases
6) Electrophysiological studies using electric and magnetic stimulation
7) Basic and clinical studies of neuromuscular diseases using biopsy materials of peripheral nerve and muscle

4. Clinical Services
We see about 100 out-patients and 40 in-patients in a day, and offer in and out-patient consultation services through the day and on weekends. We diagnose and treat stroke patients, as well as patients with epilepsy, headache, multiple sclerosis, Parkinson’s disease, spinocerebellar ataxia, and hundreds of other neurological issues, some of which are acute, others may be ongoing, or chronic. We also have an out-patient clinic specialized to patients with dementia corresponding to needs of the aging society. Our patients will be reliably evaluated and diagnosed with various skillful techniques, such as the electrophysiological, neuroradiological, and neuropsychological tests and pathological diagnosis of nerve and muscle biopsy.

5. Publications

Original Article


Book

Psychiatry and Behavioral Sciences

1. Staff members and students

**Professor**
Toru NISHIKAWA

**Associate Professor**
Akeo KURUMAJI

**Junior Associate Professor**
Naoki YAMAMOTO, Atsushi KASHIWA

**Assistant Professor**
Kazunari OSHIMA, Takashi TAKEUCHI

Tomoaki YUKIZANE, Hidenori ATSUTA
Hidekazu MASAKI (~2008.3), Masaki NISHIDA (2008.4~)

**Graduate Student**
Akihito UEZATO, Junko SATO (~2008.3)
Akiko SHIOIRI, Hironao TAKEBAYASHI (~2008.3)
Yuichiro ABE, Eriko HARA
Daisuke JITOKU, Takeshi SASAKI

2. Education

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 biological, psychological, social, and ethical approaches to neuropsychiatric diseases. 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.

3. Research

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:

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 candidate 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 pharmacobiochemistry to develop new therapeutic methods for neuropsychiatric disorders:

We are working to examine the pharmacological/biochemical effects of candidate substances to develop new drugs for neuropsychiatric disorders. Extensive research is being conducted to isolate agents associated with the metabolism of D-serine, an endogenous antipsychotic substance, and examine the effects of D-serine on neurotransmission in the brain.

2) Neurophysiological and psychophysiological studies

(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.

(ii) Studies of receptors in neuropsychiatric diseases with PET/Focal epilepsy with MRS:

We are working together with the National Institute of Radiological Sciences to study dopamine receptors in schizophrenic patients.

(iii) A study of sleep behavior in neuropsychiatric diseases:

A study is being carried out to examine sleep behavior using an originally developed automatic analysis device (polysomnography) and fMRI.

(iv) A study employing the dipole tracing method and 3D-MRI:

A study using 3D-MRI is being performed to extrapolate epileptic discharges, alpha waves, and other dipoles.
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.

4. 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 senile 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 center 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 live comfortably in social situations.

5. Publications (in English)

1. Staffs and Students (April 2008)

Professor: Kikuo Ohno
Associate Professor: Masaru Aoyagi
Assistant Professors: Tadashi Nariai, Taketoshi Maehara
Hospital stuffs: Masashi Tamaki, Kazuhiro Ogishima,
Yoji Tanaka, Kuniyasu Saigusa,
Yohei Satoh, Kyoko Sumiyoshi,
Maki Mukawa, Hirokazu Nagasaki,
Takahiro Ogishima, Kenji Yanada.
Secretary: Mariko Tasumi, Mayako Tokunaga.
Graduate Students: Mutsuya Hara, Takeko Nojiri,
Toshihiko Tomori, Shougo Imae,
Youhei Satoh, Keigo Shigeta,
Toshiyuki Inoue, Tomoaki Okada,
Yoshiyuki Matsuoka, Takashi Sugawara,
Yoshihisa Kawano, Toshiya Momose,
Korui Tamura, Yu Iwae,
Oltea Sampetrean, Mutsumi Fujii,
Shin Hirota, Tomoyuki Kinjo,
Takumi Kudoh, Kohtaro Kumagai,
Tomoyuki Nakamura, Takashi Shigematsu,
Atsuko Ishibashi, Ritsu Nishimura,
Chihiro Hosoda, Mullah Saad Habib-E-Rasul.

2. Purpose of Education

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.

3. Research Subjects

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

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

4. Clinical services

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.

5. Publications

Original Articles
3. Hirabayashi S, Nakagawa K, Sumita K, Hidaka S, Kawai T, Ikeda, M, Kawata A, Ohno K, Hata Y: Threonine 74 of MOB1 is a putative key phosphorylation site by MST2 to form the scaffold to activate nuclear Dbf2-related kinase 1. Oncogene 2008 Mar 24; [Epub ahead of print]
Review Article


Book

Neuropathology

1. Staff and Students (April, 2008)

Professor: Hitoshi OKAZAWA
Associate Professor: Yasushi ENOKIDO
MTT Lecturer: Masaki SONE
Assistant Professor: Takuya TAMURA
Tokunin Assistant Professor: Akihiko KOMURO
Graduate Students: Hikaru ITO, Hiroki SHIWAKU, Olga GODA, Ayaka YOSHITAKE, Wakana ITO, Mayumi YAMASHITA
Research Student: Sainawer MAIMAITI, Li CHAN

2. 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. We also guide practical research techniques on neuropathology especially neurodegenerative diseases.

3. Research Subjects

1) Elucidation of molecular mechanisms underlying neurodegenerative diseases and development of effective therapeutic approaches based on the information obtained.
2) Analysis of the mechanisms of mental retardation influenced by a key regulator of neurodegenerative diseases, PQBP-1.

4. Clinical Services

5. Publications

Original Articles

Immune Regulation

1. Staffs and Students (April, 2008)
Professor Hajime KARASUYAMA
Associate Professor Yoshiyuki MINEGISHI
Research Associate Shingo SATO
Research Associate Yohei KAWANO
Technical Official Toshiyuki KOJIMA
JSPS Research Fellow Kaori MUKAI
Graduate Student Kazushige OBATA, Soichiro YOSHIKAWA,
Takeshi WADA, Hideto NISHIKADO,
Hiromi OGAWA, Ryosuke I SHIKAWA,
Masako SAITO, Mayumi EGAWA

2. Purpose of 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 lymphocyte differentiation and the development of immune disorders such as
allergy and primary immunodeficiency, by employing advanced technology in molecular biology, biochemistry, cellular
biology and developmental engineering.

3. Research Subjects
1) Molecular basis of allergy: Basophil biology and pathology.
2) Genetic and molecular studies on the pathogenesis of primary immunodeficiencies.
3) Regulation of B cell development

4. Publications
Original Article
pre-B cell receptor signaling to transcriptional events required for early B cell expansion. **Immunity** 28: 499-508, 2008.
2. Tsujimura Y, Obata K, Mukai K, Shindou H, Yoshida M, Nishikado H, Kawano Y, Minegishi Y, Shimizu T and
Karasuyama H: Basophils play a pivotal role in immunoglobulin G- but not immunoglobulin E-mediated systemic
3. Watanabe M, Satoh T, Yamamoto Y, Kanai Y, Karasuyama H and Yokozeki H: Overproduction of IgE induces
novel hairless mouse model on an atopic dermatitis-prone genetic background generated by receptor-mediated

Review Article

Book
Molecular Virology

1. Staff and Students (April 2008)

Professor Shoji YAMAOKA
Assistant Professor Yasunori SAITO
Laboratory Engineer Yoshio INAGAKI
Secretary Kumiko THORPE-MATSUI
Students (Ph.D. course) Yuya MITSUKI Kei MIYAGAWA
Shin UOTA Yasunori HIRI
Hisayuki MIYAMORI

2. Purpose of Education

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 of the man. Especially, several projects are carried out with the emphasis on investigations 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 resulting transformation or destruction of normal lymphocytes. Virological, immunological and molecular approaches are being applied for this purpose.

3. Research Subjects

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 complementation of components essential for virus replication in mammalian cell.

4. Publications: Original articles

Immunotherapeutics

1. Staffs and Students (April, 2008)

ProfessorMari KANNAGI
Associate ProfessorTakao MASUDA
Assistant ProfessorAtsuhiko HASEGAWA
Postdoctoral PositionHironori NISHITSUJI, Yukiko SHIMIZU
Graduate StudentSaemi OBITSU, Takaya HAYASHI,
Ayako TAKAMORI, Fumi MIURA,
Yuki IWASAKI, Satoru TAKATSU,
Natsuko TAKATSUKA, Shuichi KINPARA

2. Purpose of Education

Our research area is in between clinical and basic science, involving immunology, microbiology, and molecular biology. We participate in education for undergraduate medical students in basic immunology and a part of clinical immunology. For graduate students, we provide opportunity to research mechanisms of infectious disease and develop immunological therapeutics.

Viral infection causes various diseases including immunodeficiency, malignancy, autoimmunity, and inflammation. Human immunodeficiency virus (HIV) causes acquired immunodeficiency syndrome (AIDS), Human T-cell leukemia virus type-I (HTLV-I) causes adult T-cell leukemia (ATL) and various chronic inflammatory autoimmune-like diseases, and severe acute respiratory syndrome corona virus (SARS-CoV) causes SARS resembling acute respiratory distress syndrome. 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 research in our department is elucidation of the role of host immunity in the diseases and development of effective immunotherapy. We also investigate intracellular mechanisms of viral replication to target direct molecules for therapy.

3. Research Projects

1. Analysis of immunological risks for ATL development in HTLV-I-carriers.
2. Development of anti-tumor vaccine using experimental animal model system for ATL.
3. Immunological and molecular mechanism of HTLV-1 induced tumorgenesis.
4. Molecular mechanism of HIV replication especially related to HIV-1 integrase.
5. Experiments based on gene therapy to suppress HIV-1 replication.
6. Immunological suppressive mechanisms on HIV-1 replication.

4. Publications

Original article

**Review Article**


**International Scientific Meetings**


**Domestic Scientific Meeting (extraction)**


Pathological Cell Biology

1. Staffs and Students (April, 2008)
Professor Shigeomi SHIMIZU
Associate Professor Norio SHIMIZU
Assistant Professor Satoko ARAKAWA
Tokunin Assistant Professor Ikuko NAKANOMYO, Reishuku LI
Secretary Mimi SAKAGUCHI, Tomomi HAKUYA
Graduate Student Yuya NISHIDA, Hirofumi YAMAGUCHI,
Kenji FUJITANI, Tohru SATOH,
Sawako SUZUKI

2. Purpose of Education
Main objective in the graduate course is to provide students opportunity to study the molecular mechanisms of cell death, the cell death-related diseases, the mitochondrial bioenergetics, 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. Research Subjects
1) Analysis of apoptosis mechanism
2) Analysis of non-apoptotic cell death (autophagic cell death)
3) Physiological role of cell death in mammals
4) Pathological role of cell death in mammals
5) Analysis of mitochondrial diseases
6) Development of novel EBV infection animal models using the hNOG mice
7) Development of an exhaustive pathogenic microbe screening system

4. Clinical Services
No services.

5. Publications
Original Article


Review Article

Book
Pediatrics and Developmental Biology

1. Staffs and Students (April, 2008)

Professor
Shuki Mizutani

Associate Professor
Tomohiro Morio

Junior Associate Professor
Shozaburo Doi
Masayuki Nagasawa

Assistant Professor
Satoshi Araki
Masami Kameda
Masatoshi Takagi
Kenichi Kashimada
Akihito Sasaki
Makoto Ono
Eriko Tanaka
Toshikiko Nishida

Tokunin Assistant Professor
Fumiaki Watanabe

Graduate Student
Yaeko Motoyoshi
Kentaro Miyai
Rie Miyata
Atsuko Taki
Naoko Ishibashi
Kimiko Hamano
Wakana Furushima
Daisuke Tomizawa
Kenji Wakabayashi
Naomi Takahashi
Masaki Sato
Junya Unno
Fumiko Honda
Kenji Isoda
Norimasa Ibara
Masaobu Takahashi

Special Study Student
Hiromi Kameda
Kouichi Kamei
Yoshiiro Fukawatase

Collaborator
Kimitoshi Imamura (Institute of Biomaterials and Bioengineering, TMDU)
Minoru Asada (Department of Pharmacology, Nippon Medical School)
Hatsume Uno (Sony Life Science Laboratories)

2. The goal of Education

The Department of Pediatrics and Developmental Biology plays a central role for education of pediatrics at the medical school. A comprehensive lecture course for 30 themes of main pediatric diseases is provided for the 3rd to 4th grade medical students. Opportunities of training in scientific research are provided for elective 4th graders. One month practice in clinical trainings is provided for 5th to 6th graders, where every student belongs to one of the professional clinical teams and studies clinical practice as one of the team members. During this course of clinical training, each student is expected to learn skills for differential diagnosis, planning of examination schedule and description of clinical records. Junior clinical fellows who are in the training course of pediatric practice under the supervision of senior staffs are also expected to supervise these medical students. Another mission of this department is to provide lecture course on general pediatrics for the students of Dental School and School of Health Science.

The main goal of the education provided by us is to support the students to strengthen their knowledge in fundamental pediatrics with the view for total care, which can be achieved only by mutual cooperation with subspecialties in various fields of pediatrics.

3. Research Subjects

The final goal of our research is to find molecular mechanisms for development of intractable diseases in children, which may enable us to find novel ways to cure. We are interested in a broad spectrum of subjects in life science field as follow.

2. Molecular mechanisms for chromosomal translocation
3. Novel role of ATM in cell differentiation
4. Novel role of Artemis in DNA repair system
5. Systematic search for genes responsible for the development of immunodeficiency diseases
6. Development of advanced techniques for cell therapy and gene therapy
7. Molecular mechanisms for development of pulmonary arterial hypertension

We collaborate with Institute of Cancer Research in London (Prof. Mel Greaves), Istitute Nazionale Tumori (Dr. D. Delia), Sony Life Science Laboratories, Medical Research Institute at TMDU, Institute of Biomaterials and Bioengineering.
The research projects of each subspecialty group in the department are as follow.

○ Hematology/Oncology/Immunology Group (Basic Research)

Our research focuses on the dissection of molecular basis of DNA damage repair response and the analysis of molecules that play important roles in human immune responses.

Our research interest involves development of the leukemogenesis model in vitro and in vivo that stemmed from defective tumor surveillance system and in-depth analysis of DNA damage response (DDR) cascades. Among the molecules involved in DDR, we focus on ATM, Artemis, and Mre11. The functions of those molecules in health and diseases have been studied at molecular, cellular, and individual level. The topics include impaired ATM function and infantile leukemia, role of Artemis in replication fork stall, regulation of Artemis stability by its associated protein. The function of mutant Mre11, XLF1, and LIGIV have been analyzed with using materials obtained from the patients deficient in each molecule. Our approach also led to the work that elucidated the function of ATM in adipocyte differentiation, which would potentially explain why the patients with Ataxia telangiectasia suffer from emaciation and from diabetes mellitus.

In the field immunodeficiency, we work on the role of btk in production of reactive oxygen species and apoptosis, maintenance of effector T-cells by ICOS, development of immunodeficiency & autoimmunity by defective ICOS function, and development of protein therapy with the use of protein transduction domain-based intracellular delivery system. We also work on the protean functions of those molecules in the non-immunological system in collaboration with other laboratories.

We aim to establish techniques that would help in our clinical field. We have recently developed a novel method to detect DDR by a flow cytometry, and continuously work to develop a novel system to detect multiple microbes rapidly and economically.

○ Cardiology Group

1) Elucidation of mechanisms how pulmonary hypertension (PH) occurs and development of concrete evaluation method of PH, followed by new therapeutics for PH
2) Establishment of the methods for functional evaluations in left and right ventricles by using 2D speckle tracking echocardiogram
3) Clarification of judgment methodology in severity of fatal arrhythmias
4) Analyses of relationships between changes in ventricular function during cardiac developmental stages, and myocardial intracellular Ca\(^{2+}\) transient

○ Neurology Group

1) Mechanism of neurodegeneration and therapeutic approach in xeroderma pigmentosum
2) Role of oxidative stress in childhood neurodegenerative diseases

○ Endocrinology Group

1) In vitro assay of mutated 21-hydroxylase enzyme activity
2) Factors that influence BMP2 signaling pathway in osteoblasts
3) Genetic control of human sex determination

○ Neonatology group

1) Relationship between neoangiogenesis in fetuses and complication of preterm infants
2) Effectiveness of neonatal cardio-pulmonary resuscitation program in JAPAN

○ Nephrology Group

1) Mechanism of renal tubular injury and progression to renal failure due to nonselective proteinuria.
2) Efficacy of Rituximab for severe idiopathic nephrotic syndrome: correlation of B cells, T cells, and activating markers in those with Rituximab administration and relapse of nephrotic syndrome.
3) Inulin clearance: study of efficacy and safety for children.
4) Analysis of lymphocyte subset in patients with nephrotic syndrome.

We work on these research in cooperation with Tokai University (1) and National Center of Health and Development (2,3,4).

○Allergy Group

To elucidate molecular mechanisms for food allergy such as against milk and egg is one of the main projects of our group. In the light of recent progress of immunology we focus on the regulatory T cells which inhibit Th2 type immune response. We are one of the research members on the epidemiological study of allergic disorder supported by a grant-in-aid from Ministry of Health, Labor and Welfare, Japan. We collaborate with pharmaceutical companies on the study of clinical efficacy of leukotriene antagonist. Clinical and epidemiological study on food allergy is another major field in our study.

4. Clinical Services

○Hematology/Oncology/Immunology Group

Hematology-Oncology-Immunology Group treats the patients with hematological malignancies, hematological disorders, malignant solid tumors, and primary immunodeficiency. Our team consists of 3 senior and 3 junior staff, and care both inpatients and outpatients cooperatively.

In collaboration with international co-operative clinical research group, we offer the latest treatment for these patients with malignancy. Furthermore, we perform HSCT (hematopoietic stem cell transplantation) for patients with leukemia, refractory malignant solid tumor, and primary immunodeficiency. We also undergo clinical research for effectiveness of activated T cell therapy against refractory persistent virus infection and graft failure after HSCT in collaboration with institutional cell therapy center.

New inpatients in 2008 include 6 ALL (acute lymphocytic leukemia), 7 AML (acute myelogenous leukemia), one CML (chronic myelogeneous leukemia), 4 malignant lymphoma, one medulloblastoma, one intracranial germinal tumor, one ovarian tumor, one synovial tumor, 4 SCID (severe combined immunodeficiency), two WAS (Wiskott-Aldrich syndrome), two bone marrow failure syndrome, one EB virus hemophagocytic syndrome, one immune thrombocytopenic purpura, two unclassified immunodeficiency and so on. We performed seven HSCT, which include five unrelated cord blood, one related, and one autologous HSCT in 2008.

We have performed more than 120 HSCT so far, which includes more than 40 cases with primary immunodeficiency. With these experiences, we are leading this field in Japan.

○Cardiology Group

Pediatric cardiology group provides an original concrete judgment and evaluation using pulmonary vascular pressure-flow relationships for severe pulmonary hypertensive (PH) patients, which is followed by active treatment such as surgical operation, NO inhalation and another medications for PH patients. We try an earlier application of percutaneous cardiopulmonary support for fulminant myocarditis patients, and cardiac resynchronization therapy for medication-resistant severe cardiomyopathy patients by utilizing a new method of echocardiogram. Moreover, we participate in Raise study for severe Kawasaki diseases, which compares two kinds of treatments, immunoglobulin only or combination of immunoglobulin and prednisolone.

○Neurology Group

Child neurology Group provides highly specialized diagnostic and medical care for neurological disorders such as epilepsy, neuromuscular disorders, infections of nervous system and other neurodegenerative diseases. In particular, we provide therapeutic approach of xeroderma pigmentosum by using of clinicopathological analysis.

○Endocrinology Group

Endocrinology group provides diagnosis and treatment for patients with pediatric endocrine disorders, such as growth disorders, pubertal disorders, hypopituitarism, Turner syndrome, thyroid disorders, adrenal disorders, problems of calcium and phosphate metabolism, diabetes mellitus and so on.

Our department is one of the neonatal mass-screening centers for congenital adrenal hyperplasia and congenital hypothyroidism in Tokyo Metropolis.

We hold summer camp program for children with type 1 diabetes mellitus in every August.
Neonatology group

Neonatal and Infantile High Care Unit (NIHCU) for severely ill neonates and infants has started since July 2008. NIHCU treats preterm infants (>32 weeks of gestation, >1500g of birth weights) and sick children who have cardiac diseases, respiratory diseases, hypoglycemia, birth asphyxia, infection and so on. We provide comprehensive care for critically ill newborns and infants, using various medical devices, such as blood gas analyzer, artificial respirators, NO inhalation system, fiberoptic bronchoscopes and brain function monitor.

Nephrology Group

Nephrology Group provides diagnosis and treatment for patients with in school urinary analysis screening, acute nephritis, chronic nephritis, nephrotic syndrome, congenital kidney diseases and proteinuria or hematuria found. We have specialized pediatric nephrology section for outpatients in our hospital and in some cooperative hospitals.

Allergy Group

Allergy Group provides diagnosis and medical care for patients with allergic diseases such as asthma, food allergy, atopic dermatitis mainly at outpatient clinic.

5. Publications

Original Article


14. Kashiwada K, Omori T, Takizawa F, Mizutani S. Two cases of transient pseudohypoaldosteronism due to group B


Congress


1. Staffs and Students (April, 2008)

Professor Nobuyuki MIYASAKA Masayoshi HARIGAI
Associate Professor Hitoshi KOHISAKA Tetsuo KUBOTA
Ryuji KOIKE Toshihiro NANKI
Junior Associate Professor Kazuki TAKADA
Assistant Professor Fumihito SUZUKI Fumitaka MIZOGUCHI
Michi TANAKA Yukiko KOMANO
Graduate Student Akito TAKAMURA Kaori WATANABE
Kaneko KANEKO Masayasu TOYOMOTO
Research Student Yousuke MURAKAMI
Resident Shinya HIRATA Hisanori HASEGAWA
Tadashi HOSOYA Hayato YAMAZAKI

2. Purpose of Education
We have provided medical students with the opportunity to obtain the ability to find important clinical problems and to solve it voluntarily in the diagnosis and treatment of rheumatic diseases. We have also aimed to purs the concept of ‘from clinic to bench’ through our holistic medicine.

3. Research Subjects
1) The development of new treatments for rheumatoid arthritis using cell cycle regulators.
2) The investigation of immunopathology and the development of new treatments for the polymyositis.
3) The function analysis of chemokines / chemokine receptors in rheumatoid arthritis and the therapeutic applications of it.
4) The establishment of evidence-based medicine of rheumatic diseases.

4. Clinical Services
We have examined the patients with various rheumatic diseases. In 2008, 243 patients were admitted into our hospital. We have aimed to practice evidence-based medicine and to provide high quality care. In addition, we have actively participated in the clinical trials for the biological agents including infliximab, etanercept, adalimumab, tocilizumab, abatacept and so on. Furthermore, we have greatly contributed to the pharmacovigilance in Japan through the REAL and the SECURE study.

5. Publications

Original Article


Bioregulation

Dermatology

1. Staffs and Students (April 2008)

Professor    Hiroo YOKOZEKI
Associate Professor  Takahiro SATOH
Junior Associate Professor  Ken IGAWA,  Tetsuya HIGUCHI,  Kaoru TAKAYAMA
Assistant Professor  Nobuhiko UEDA,  Yoshiko OKUBO,  Aya NISHIZAWA,  Tomoko TANAKA
Hospital Staff     Eishi TAKAHASHI,  Syouun TOKORO,  Tomoko HARADA
Secretary    Yu KAWAMURA,  Yukako KIKUCHI
Residents     Madoka ARAI,  Kayo USUDA,  Makiko NAKATUKA,  Kohei NOJIMA,  Kosuke HARUYAMA,  Risa WATANABE,
Graduate Students  Chieko SHIMURA,  Naoko OKIYAMA,  Tsukasa UGAJIN,  Akiko IMAI,  Yuichi ITO,  Makiko UENO,  Tomoko TANAKA,  Yoshihiro YAMAMOTO,
                      Kazumi SAEKI,                             Yuki MATSUSHIMA,  Kazuki HOSOYA,  Yasumasa KANAI
                      Tomoko TANAKA,  Yoshihiro YAMAMOTO,

2. Purpose of Education

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.

3. Research Subjects

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) Therapeutic approach for scleroderma by decoy oligodeoxynucleotides
8) The CD40-CD40ligand interaction in patients with drug eruptions
9) Pathophysiology of hyperhidrosis

4. Clinical Services

Dermatology clinic provides an advanced treatment for skin diseases; skin tumors, infectious diseases, skin allergy, collagen diseases and psoriasis. Recently, we established the gene thearies (STAT6 decoy ODN) for severe atopic dermatitis in the clinic.

5. Publications

Original Article


Review Article

Book
Pathological Biochemistry

1. Staffs and Students (April, 2008)

Professor Hirobumi TERAOKA
Assistant Professor Ken-ichi YOSHIOKA
Research Assistant Keiko SHIMIZU-SAITO
Post Doctoral Fellow (JST) Yousuke ICHIJIMA,
Graduate Students Hiroaki FUJIMORI, Mima SHIKANAI,
Tsuyoshi SAITO, Tomohiro NISHIDA,
Hisaharu MASAKI, Keitaro SHINOHE,
Kentarō TATSUMI, Yumi TADAI,
Kensuke HAMADA

2. Purpose of Education

Main object of Pathological Biochemistry in the graduate course is to provide students opportunity to study advanced DNA metabolism (replication, repair and recombination) and cell fate (proliferation, differentiation, cell death and cellular transformation). In particular, students are taught on DNA double-strand break signaling/repair and basic regenerative medicine of liver.

3. Research Subjects

1) Signaling of DNA double-strand breaks and molecular mechanism of non-homologous end-joining
2) Genomic instability via carryover of replication stress-induced DNA lesions into the M phase
3) Maintenance of genome integrity in pluripotent stem cells (ES cells, iPSC cells)
4) Differentiation of pluripotent stem cells into a hepatocyte lineage
5) Epigenetic regulation of liver-specific or liver-related genes
6) Ex utero transplantation of hepatic progenitor cells into mouse fetal liver

4. Publications

Original Articles

Department of Immunology

1. Staffs and Students (April, 2008)

Professor
Takeshi Tsubata, M.D., Ph.D.

Associate Professor
Takahiro Adachi, Ph.D.

Junior Associate Professor
Makoto Tsuji, Ph.D.

Assistant Professor
Kozo Watanabe, Ph.D.

Assistant Professor
Yusuke Kishi

Technician
Koji Hayashizaki

Secretary
Hiroko Takahashi, Junko Shinya

Graduate Student
Hou You, Man Rong Yong,
T.D.C.P.Gunasekara, Xu Miduo,
Yuki Ishii, Aya Sato,
Makiko Konishi, Taichi Tamanaka,
Yasurou Sakamaki, Chiaki Takaku,
Mai Tanaka, Weng Dong

2. Purpose of Education

The immune system is essential for host protection against pathogens and cancer cells, and its ability to protect host is augmented by vaccination and previous infection. In contrast, abnormal immune responses are involved in pathogenesis of autoimmune diseases and allergy. Faculty members of the Department of Immunology are coordinating the lecture course of immunology and instructing graduate students to conduct their research projects on immunology for elucidating how the normal immune system respond to pathogens but not self-antigens or environmental antigens, how this discrimination is disrupted in allergy and autoimmune diseases, and how vaccination augments immune responses. Some of the research projects are aiming at developing new strategies for augmenting infection immunity and for controlling abnormal immune responses.

3. Research Subjects

1) Elucidation of the roles of membrane-bound lectins and their glycan ligands in normal and abnormal immune responses of B lymphocytes.
2) Elucidation of the roles of unfolded protein response molecules in B lymphocyte immune responses.
3) Elucidation of the regulatory mechanisms for self-reactive B lymphocytes and their defect in autoimmune diseases.
4) Chemical biology of B lymphocyte immune responses
5) Generation of novel strategies for host protection against pathogens and treatment of autoimmune diseases.

5. Publications

[Original Article]


[Book]

Cellular and Environmental Biology (General Isotope Center)

1. Staffs and Students (April, 2008)
   Associate Professor   Masayuki HARA
   Graduate Student     Satoru MIYAKURA

2. Purpose of 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. 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 change in environment, cell
      differentiation, disease, or drug exposure.
Human Pathology

1. Staff and Students

Professor                     Yoshinobu EISHI
Assistant Professor           Tetsuo YAMADA, Hiroshi KAWACHI,
Laboratory Technician         Yoshimi SUZUKI
Technical Assistant           Asuka FURUKAWA
Secretary                     Miho IWAMITSU
Graduate Student              Urara TAMAHASHI, Maki KOBAYASHI,
                              Kayoko ICHIMURA, Shinichi HIROOKA,
                              Tomonari AMANO, Mariko NEGI,
                              Naoko OKAMOTO, Masaki TAKASHIMA,
                              Hiroko OGINO, Manami TAKIZAWA,
                              Aya MIWA, Eri NISHIKAWA
Research Student              Mitsuru NOGI, Shinichiro HORIZUCHI,
                              Kazumi HORIGUCHI, Kana MINEGISHI

2. Purpose of education

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 educated to associate their researches with problems in diagnosis and treatment of diseases and etiologies of the diseases of unknown causes. 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.

3. Research Subjects

1) Endogenous infection (diseases caused by indigenous microorganisms in susceptible hosts)
2) Cancer research (histopathology, carcinogenesis, prognostic factors, and so on)

4. Clinical Services

Teaching staffs in Human Pathology support all functions of Surgical Pathology in our university hospital.

5. Publications

Original Article


Digestive and Metabolic Diseases

Gastroenterology and Hepatology

1. Staffs and Students (April, 2008)
   Professor Mamoru WATANABE
   Associate Professor Naoya SAKAMOTO (Department for Hepatitis Control), Ryuichi OKAMOTO (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Junior Associate Professor Kiichiro TSUCHIYA, Tetsuya NAKAMURA (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Assistant Professor Akihiro ARAKI (Department of Endoscopic Diagnosis and Therapeutics), Masakazu NAGAHORI, Shinji SUZUKI, Shinya OOKA (April〜), Cheng-Hsin CHEN, Teruji TOTSUKA, Takashi NAGAISHI (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Junior Associate Professor Kiichiro TSUCHIYA, Tetsuya NAKAMURA (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Assistant Professor Akihiro ARAKI (Department of Endoscopic Diagnosis and Therapeutics), Masakazu NAGAHORI, Shinji SUZUKI, Shinya OOKA (April〜), Cheng-Hsin CHEN, Teruji TOTSUKA, Takashi NAGAISHI (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Junior Associate Professor Kiichiro TSUCHIYA, Tetsuya NAKAMURA (Department of Advanced Therapeutics in Gastrointestinal Diseases)
   Assistant Professor Akihiro ARAKI (Department of Endoscopic Diagnosis and Therapeutics), Masakazu NAGAHORI, Shinji SUZUKI, Shinya OOKA (April〜), Cheng-Hsin CHEN, Teruji TOTSUKA, Takashi NAGAISHI (Department of Advanced Therapeutics in Gastrointestinal Diseases)

2. Education Principles
   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 clinicl 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.

3. Basic Research Projects
   • Elucidating the pathophysiology of inflammatory bowel diseases and development of treatment by disease-specific immue-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.

4. 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 double-balloon enteroscopy.
・ Advanced diagnosis and treatment of colonic diseases by colonoscopy.
・ Development of minimally-invasive diagnostic modalities for gastrointestinal diseases (i.e. CT colonography).
・ Improved chemotherapy for gastric and pancreatic malignancies.

5. Publications


Surgical Oncology

1. Staffs and Students

Professor: Kenichi SUGIHARA
Junior Associate Professor: Masayuki ENOMOTO, Kazuyuki KOJIMA
Assistant Professor: Tetsuro HIGUCHI, Satoru IIDA, Mikito INOKUCHI, Takanobu SATO, Hirotoshi KOBAYASHI, Tsuyoshi NAKAGAWA
Associate Professor: Hiroyuki UETAKE (Translational oncology)
Assistant Professor: Toshiaki ISHIKAWA (Translational oncology)
Tokunin Associate Professor: Masamichi YASUNO
Tokunin Assistant Professor: Megumi ISHIGURO
Hospital Staff: Keiji KATO
Graduate Student: Satoru TAKENAKA, Hiroshi MAKINO, Yoichi TORIYA, Takashi KUWAYAMA, Tsuyoshi YOSHIDA, Yasushi TAKATSUNO, Ken HINOUE, Mikiko HAYASHI, Tetsuma CHIBA, Shigeo HIRASAKI, Makoto NAGAHARA, Kazuo MOTOYAMA, Haruhiko MOTOYAMA, Megumu ENJOJI, Takatoshi MATSUYAMA, Hirohumi SUGITA, Sayaka SHIMIZU, Hiromi KAWAI, Hiroaki ONO, Satoru OKAZAKI, Sho OTSUKI, Yashar MURATE, Tsuyoshi ODA, Akifumi KIKUCHI, Shunsuke TSUKAMOTO, Yoshitake FUJIMORI, Ahamad KAMAS

2. Purpose of Education

Main objective of surgical oncology in the graduate course is to provide students with opportunity to study oncology in order to become the well-rounded surgeon who has international and scientific feelings.

3. Research Subjects

1) Role of Cox-2 and VEGF in growth of solid tumor and angiogenesis
2) Identification of predictive factors for chemo-responsiveness and prognosis in cancer by molecular biological technique.

4. Clinical Services

Surgical oncology clinic performs less invasive operation for cancer of stomach, colon and rectum, and breast with new devices including laparoscope, thereby allowing physiological and neurological functions to be preserved. Moreover, treatment with chemotherapeutic agents for cancer is also conducted.

5. Publications


1. Staffs and Students (April 2008)

Professor Noboru MIZUSHIMA
Junior Associate Professor Katsushige SATO
Assistant Professor Naotada ISHIHARA, Taichi HARA
Tokunin Assistant Professor Takahiro SASAKI
Medical Fellow Chieko KISHI
Postdoctoral Fellow Masae KINOSHITA
Graduate Student Nao HOSOKAWA, Anoop Kumar VELIKKAKATHGOPI, Yutaka MIURA, Takeshi KAIZUKA
Research Student Sahani Mayurbhai HIMATBHAI

2. Purpose of Education
Our department is a branch of basic medical science. In the undergraduate course, our department deals with physiology and introductory cell biology. Our main object in the graduate course is to provide a wide range of views to understand human biology using various research techniques such as molecular biology, biochemistry, cell biology and mouse genetics.

3. Research Subjects
1) Molecular mechanism of autophagy, a dynamic degradation system within cells
2) Physiological and pathophysiological roles of autophagy
3) Development of new methods for monitoring autophagy
4) Membrane dynamics of mitochondrial fission and fusion
5) Optical Imaging and analysis of the central nervous system

4. Publications

Original Article


Review Article


Book
Cardiovascular Medicine

1. Staffs and Students (April, 2008)

Professor  Mitsuaki Isobe
Associate Professor  Kenzo Hirao
Junior Associate Professor  Tokuhiro Kawara, Hitoshi Hachiya
Assistant Professor  Mihoko Kawabata, Hiroshi Inagaki, Go Haraguchi, Masatoshi Komura, Shigeki Kimura, Ryoko Azuma
Graduate Student  Kino Futamatsu, Takanobu Yamamoto, Toshiyuki Furukawa, Kazuya Isobe, Takashi Ishihara, Masanori Konishi, Hirokazu Ohigashi, Yasutoshi Nagata, Tetsuya Katsuno, Kengo Tanabe, Manabu Kurabayashi, Ayumi Goda, Yoshinide Takahashi, Takeshi Sasaki, Masakazu Ohno, Koji Higuchi, Kamimura Munehiro, Sasaoka Taro, Tatsuya Hayashi, Masaaki Shoji, Shingo Maeda, Seiji Matsubara

2. Education
We are dealing with pathophysiology of circulatory system especially cardiovascular diseases. Cardiovascular diseases are principal cause of death in our country. These diseases are categorized into several fields. They include ischemic heart disease, myocardial disease, valvular disease, atherosclerosis, arrhythmia, and infectious disease. The common final figure of these diseases is heart failure leading to patients’ death. Based on recent progresses in molecular biology and bioengineering our knowledge on the pathophysiology of these diseases has been expanded rapidly. There are variety of new diagnostic technologies including imaging tests, hematological tests and electrophysiological tests. In addition, development in the treatment of cardiovascular disease is overwhelming. They include intravascular catheter intervention, catheter ablation and operation. Medical treatment has also been progressed rapidly. Further, gene therapy for cardiovascular diseases has started. All of these fields are our focus for education. In this course, students learn about modern knowledge and technologies in cardiovascular diseases, especially in the field of pathophysiology, diagnosis, treatment and prevention.

3. Research Subjects
The purposes of our investigation are to reveal the etiology and pathophysiology of cardiovascular diseases, and to develop new technologies for diagnosis and treatment. For that purpose we investigate clinical cases and model animals. Currently our investigations are focused on arteriosclerosis, atherosclerosis, cardiomyopathy, myocarditis, arrhythmias, cardiac rejection and heart failure. The relationship between gene mutation and cardiovascular disease, electrophysiology, myocardial cell transplantation and myocardial regeneration are also our major subjects of research.

1) Clinical study of gene therapy for coronary artery disease (Isobe)
2) Clinical study for treatment of acute coronary syndrome (Isobe, Inagaki, Kimura)
3) Molecular mechanism and treatment of myocardial ischemia and reperfusion injury (Isobe, Haraguchi)
4) Molecular mechanism and treatment of coronary restenosis and vascular disease (Isobe)
5) Gene therapy of myocarditis and cardiac chronic rejection (Isobe, Suzuki)
6) Cardiac rejection and immunological tolerance (development of safe immunosuppressive therapy) (Isobe, Suzuki)
7) Treatment of heart failure and cardiomyopathy by myocardial regeneration (Isobe, Suzuki)
8) Regulation of arteriosclerosis by targeting transcription factors (Isobe)
9) Gene therapy of vascular disease (Isobe)
10) Diagnostic imaging of aortitis (Isobe)
11) Molecular mechanism and treatment of aortitis (Isobe)
Cardio-Pulmonary Diseases

12) Assessment of vascular endothelial dysfunction in vasculitis, heart failure and arrhythmia (Isobe)
13) Application in gene therapy for heart failure and cardiomyopathy (Isobe)
14) Molecular system of myocardial remodeling in heart failure and ventricular hypertrophy (Isobe)
15) Therapy of sleep apnea syndrome with heart failure (Isobe)
16) Assessment by imaging of coronary artery and cardiac function (Isobe, Tezuka)
17) System of origin with tachyarrhythmias (particularly supraventricular tachycardia) (Hirao)
18) Medical therapy and ablation for tachyarrhythmias (Hirao)
19) Research for the conduction of atrio-ventricular node (Hirao)
20) Research and Therapy for arrhythmia by using Cardioendosope (Hirao)
21) Research of atrial fibrillation from origin of pulmonary vein (Hirao)
22) Research of genetic factor with atrial fibrillation (Hirao, Hachiya)
23) Research of ablation for atrial fibrillation (Hirao, Hachiya)

We conduct collaborative researches with not only Medical Research Institute and other facilities in our university but also domestic and foreign institutes according to research projects. Since clinical cases in our hospital are diverse and abundant, clinical investigations are also our major target. Therefore, we can provide many research projects depending on students’ need. We encourage and help students to pursue their own original way of investigation.

4. Clinical Services
Students are also encouraged to learn about clinical cardiology. They can participate in any clinical activities underwent in our hospital including cardiac catheterization, electrophysiological study, catheter ablation, various imaging tests, cardiac pathology, and patients care.

5. Publications
Original Article
Anesthesiology

1. Staffs and Students (April, 2008)

Professor: Koshi MAKITA
Associate Professor: Koichi NAKAZAWA
Junior Associate Professor: Tokujiro UCHIDA, Seiji ISHIKAWA
Assistant Professor: Akio MASUDA, Megumi OHATA, Hiroyuki KOBINATA, Sakurako ISHIBASHI
Hospital Staff: Satomi KANEKO, Eri IKEDA, Fumi MAKINO, Yoriko DATE, Yuzuru INATOMI, Akiko FUJISAWA, Yosie Otani, Takashi HAKUSUI
Graduate Student: Yoshiyasu MATSUZAWA, Naoko YAMAKAWA, Fukami NAKAJIMA

2. Purpose of Education

The department of anesthesiology is an integral part of the health care system providing valuable perioperative services as well as pain relief and critical care management. Our goals of education are understanding clinical pathophysiology and clinical pharmacology, which are essential for daily clinical activities to treat patients with critical illness undergoing major surgery and to relieve patients suffering from severe pain.

3. Research Subjects

1) Pathophysiology of shock status
2) Acute lung injury
3) Partial liquid ventilation and lung protective ventilation
4) Pulmonary circulation
5) Physiology related with stellate ganglion block
6) Pathophysiology of brain ischemia
7) Perioperative management

4. Clinical Services

Service of the department of anesthesiology covers perioperative management of surgical patients and pain relief services for patients suffering severe chronic pain.

5. Publications

Thoracic and Cardiovascular Surgery

1. Staffs and Students (April. 2008)

Professor Hirokuni ARAI
Associate Professor
Junior Associate Professor
Assistant Professor Katsuo KOJIMA, Tomoya YOSHIZAKI, Fusahiko ITO, Naoyuki FUJIWARA, Naoto MIYAGI
Hospital Staff 3
Graduate Student 1
Research Student 0

2. Purpose of education

Thoracic and Cardiovascular Surgery is a branch of medical science which deals the surgical treatment of the disease of lung, mediastinum, heart and aorta. Main objective of Thoracic and Cardiovascular Surgery in the graduate course is to provide students opportunity to study surgical anatomy, pathophysiology, pharmacology, and advanced treatment. Students are also taught basic research for the surgical treatment.

3. Research Subjects

1) Developing new device in OPCAB surgery and evaluation in clinical use
2) Developing new technique/surgery for ischemic heart disease
3) Developing technique of beating mitral valve surgery
4) Research for artificial heart and heart and/or lung transplantation
5) Developing technique of lung resection with preserving lung function
6) Diagnose and treatment with video-assisted surgery

4. Clinical Services

Surgical treatment of the disease of lung, mediastinum, heart and aorta, especially for lung cancer, ischemic and valvular heart disease, and aortic disease are performed. Especially for elderly patients, we offer minimum invasive surgery. We also offer the forefront science and technology to our treatment and surgery.

5. Publications in English


International Presentation

4. Naoto Miyagi, Kiyotoshi Oishi, Eki Nagaoka, Tomohiro Ushiyama, Takeshi Someya, Fusahiko Ito, Hirokuni Arai. The multi-suction heart positioner TENTACLES equipped with epicardiac sensors for prediction of ischemic change and hemodynamic instability during OPCAB. The international society for minimally invasive cardiothoracic
Cardiovascular Physiology and Pathophysiology

1. Staffs and Students (January, 2008)
Professor (concurrent, Professor of Genetic Regulation) Akinori KIMURA
Associate Professor Seiko KAWANO
Associate Professor Yuji HIRANO

2. Purpose of Education (see also Genetic Regulation)
Electrophysiological, pathophysiological, and cell biological studies on the function of heart and cardiomyocytes.

3. Research Subjects (see also Genetic Regulation)
1) Mechanisms for differentiation of embryonic stem (ES) cells to cardiomyocytes and their physiological functions
2) Intracellular regulation of Ca signaling in stem cells during differentiating processes
3) Use of computer simulation model to decipher the role of ion channels in relation to arrhythmias

4. Publications (see also Genetic Regulation)
None
Bio-informational Pharmacology

1. Staffs and Students (April, 2008)
Professor Tetsushi FURUKAWA
Associate Professor Junko KUROKAWA
Assistant Professor Asami KAIHARA
Tokunin Assistant Professor Tetsuro SASANO, Yusuke Ebana
Secretary Kuniko YAMAGUCHI
Graduate Student Tokuhisa UEJIMA, Mahoko ASAYAMA, Yuya KARUBE, Takashi MAEDA, Takayuki NAKAJIMA
Research Student Kenji YAMASHIRO, Emika KUROBANE
Technician Eri OZAKI, Mika KANARI

2. Purpose of Education
This laboratory focuses on understanding fundamental physiological roles of ion channels and transporters in cardiovascular system. We employ multidisciplinary approach (patch-clamp, cell biology, optical recording, proteomics, and computational analysis) in order to seek novel regulatory mechanisms and modulatory molecules/compounds of ion channels and transporters in cardiac myocytes, vascular smooth muscle and endothelial cells, and circulating cells in vessels (monocytes and macrophages). Our ultimate goal is to discover novel diagnostic and therapeutic strategy for intractable cardiovascular diseases, such as sudden death, life-threatening arrhythmias, and atherosclerosis, by modulating ion channels and transporters.

3. Research Subjects
1) Basic research on gender-specific medicine (GSM)
   i) Characterization of sex hormone receptors involved in non-genomic effects
   ii) Oxidative modification of the cardiac IKs channel
   iii) Analysis of gender difference of arrhythmias with computer simulation model
2) Research on atrial fibrillation
   i) Analysis of gene polymorphism associated with atrial fibrillation
   ii) Inflammatory and immunological mechanisms involved in early stage of atrial fibrillation
   iii) Mechanism for development of myocardial sleeve in the pulmonary vein
3) Basic research on gender-specific medicine (GSM)
   i) Designing molecular imaging probe for ion channels
   ii) Roles of ion channels in macrophage-involved phagocytosis and inflammation
   iii) Auto-immune mechanisms involved in arrhythmia development

4. Clinical Services
N/A

5. Publications
Original Article
Molecular Medicine and Metabolism

1. Staffs and Students (April, 2008)

Professor     Yoshihiro OGAWA
Associate Professor  Yasutomii KAMEI
Assistant Professor   Takayoshi SUGANAMI
Tokinun Assistant Professor Ayaka ITO
Secretary        Ai TOGO
Graduate Students  Michiko ITOH, Rumi HACHIYA,
                   Miyako TANAKA, Takanobu YAMAMOTO,
                   Yoshihiro YAMZAKI, Kenji YAMASHIRO,
                   Satoshi SUGITA, Masayuki ICHIKA,
                   Hirohide NANBU, Fumiko AKAIKE,
Research Students  Tatsuya EHARA, Naoto TSUDA

2. Purpose of Education

The concept of the metabolic syndrome has come before the footlight because it is a precursory state of atherosclerotic
diseases. It has been defined as a constellation of abdominal obesity, insulin resistance, hyperlipidemia, and hypertension,
and is a multi-factorial pathologic condition that arises from complex interactions between genetic and environmental
factors. In our laboratory, all the staffs and students have been provided the unique opportunities to investigate the
pathophysiologic and therapeutic implication of adipocytokines, nuclear hormone receptors, and transcriptional
co-activators/co-repressors toward the better understanding of the molecular mechanism of the metabolic syndrome.

3. Research Subjects

1) In vivo and in vitro inhibition of monocyte adhesion to endothelial cells and endothelial adhesion molecules by
eicosapentaenoic acid
2) Role of CCR2 in bone marrow cells in the recruitment of macrophages into obese adipose tissue
3) Role of RXRγ in the skeletal muscle glucose and lipid metabolism

4. Publications

Developmental and Regenerative Biology

1. Staffs and Students (April, 2008)
Professor Hiroshi NISHINA
Assistant Professor Yoichi ASAOKA, Takashi NAKAMURA, Shinya TAKAHASHI, Takahiro NEGISHI
Secretary Keiko OTAKA
Graduate Student Tadashi YOKOI, Hiroshi OHASHI

2. Purpose of Education
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.

3. Research Subjects
1) Activation mechanism and physiological roles of stress-activated MAP kinase signaling pathway
2) Molecular mechanism of mouse liver regeneration
3) Mutations affecting liver development and function in Medaka, Oryzias Latipes

4. Publications
Original Article
Department of Nephrology

1. Staffs and Students (April, 2008)
Professor
Sei SASAKI
Associate Professor
Shinichi UCHIDA Tatemitsu RAI (Dept. of Blood Purification)
Junior Associate Professor
Tomokazu OKADO
Assistant Professor
Eisei SOHARA Akihito OHTA (Dept. of Blood Purification)
Tokunin Assistant Professor
Yumi NODA
Hospital Staff
Mai WAKABAYASHI Wataru AKITA
Mari IWAMOTO Rie OKUTSU (Dept. of Blood Purification)
Fumie SATO (Dept. of Blood Purification)
Secretary
Asa MURANO, Miki SAKIYAMA, Yukiko ITO
Graduate Student
Eriko OHTA Rie OKUTSU
Naohumi YUI Hitoshi KUWANA
Shotaro NAITO Kayoko ETO
Naohiro NOMURA Katsuyuki OI
Gulibaha TALATI
Research Student
Yuhua LI

2. Purpose of Education
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. Through the activities our department has brought up a number of leading nephrologists who contribute to establishing nephrology in Japan and in the world. Academic research is another important mission of our department. Research from bench experiments to clinical studies has been performed to understand the pathogenesis of the diseases and to develop new therapeutic strategies. Especially, our study on “water-electrolyte transport in the kidney and related diseases” is well known worldwide for its originality and high quality. We hope new young scientists and physicians join us for future science and nephrology.

3. Research Subjects
We have been studying renal membrane transporters and channels for more than 20 years. Most of the AQP water channels and CLC chloride channels were cloned in our laboratory in 1990s (Nature1993, PNAS1994, JBC1993&1994, Neuron1994, etc) and the physiological roles in vivo have been analyzed by generating the KO mice (Nature Genet1999, PNAS2006, etc). Recently, we are interested in regulators of transporters and channels (JCB2008), and discovered a novel kinase cascade (WNK-OSR1/SPAK-NCC) regulating NaCl balance in the body (Cell Metab 2007). Based on the molecular mechanisms we identified, we hope to find the way to regulate renal transporters and channels.

4. Clinical Services
We are taking care of a variety of kidney diseases including acute kidney injury, chronic kidney disease, blood purification, and renal transplantation. We routinely perform renal biopsy.

5. Publications
Original Article
Regulation of Internal Environment and Reproduction


Regulation of Internal Environment and Reproduction

Review Article


Comprehensive Reproductive Medicine

1. Staffs and Students (2008)

Professor: Toshiro Kubota
Junior Associate Professor: Yasufumi Shimizu, Satoshi Obayashi,
Naoyuki Miyasaka
Assistant professor: Naoyuki Yoshiki, Tatsuya Harada,
Yoshimi Taniguchi, Masakazu Terauchi,
Tomoko Ishibashi, Akira Wakabayashi,
Tomonori Ishikawa
Hospital Staff: Masaki Sekiguchi, Daigo Sato,
Sato Takamine
Resident: Izumi Honda, Miwa Shimizu
IVF staff: Mina Iwata
Registered dietitian: Mihoko Akiyoshi, Kiyoko Kato
Secretary: Urara Ozawa, Hiroko Nogi,
Sumiko Ichinose, Noriko Mizutani
Graduate Student: Makiko Tajima, Noriko Sudo (Oshima),
Mikayo Toba, Yuki Iwahara,

2. Purpose of 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. Research Subjects

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 clamp )
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

4. Clinical Services

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.

5. Publications

Original Article


5. Yasufumi Shimizu, Reiko Minaguchi, Tomonori Ishikawa, Tatsuya Harada, Naoyuki Yoshiki and Toshiro Kubota: Increase in the concentration of cytosolic-free calcium induced by human follicular fluid was decreased in single human spermatozoon with abnormal morphology. Reproductive Medicine and Biology, 7:143-149, 2008.
Urology

1. Staffs and Students (December, 2008)

Professor and Chairman
Kazunori Kihara

Associate Professor
Satoru Kawakami

Lecturer
Yasuhiro Fujii, Hitoshi Masuda (July~),
Tsuyoshi Kobayashi (~June)

Assistant Professor
Fumitaka Koga, Yasuyuki Sakai,
Noboru Numao, Kazutaka Saito (~June),
Nobutaka Chiyanagi (July~)

Hospital Staff
Akihiro Yano (June~), Aki Iwai (~May),
Yasumasa Iimura, Minato Yokoyama,
Mizuaki Sakura, Manabu Tatokoro,
Soichiro Yoshida, Yoshinobu Komai,
Toshiki Kijima (Oct~)

Graduate Student
Hideto Kano, Masaki Tanaka,
Yukihiro Otsuka, Yasumasa Iimura,
Minato Yokoyama, Mizuaki Sakura,
Manabu Tatokoro, Soichiro Yoshida,
Yoshinobu Komai, Toshiki Kijima,
Naoko Kawamura, Naotaka Fukui,
Sachi Kitayama, Yasukazu Nakaniishi,
Yuichi Kubo, Hideki Takeshita

2. Purpose of Education

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, which are listed below.

3. Research Subjects

Clinical Research
1) Innovation and establishment of minimally invasive, gasless single port access urological surgery
2) Development of optimal 3-dimensional prostate needle biopsy
3) Development of nomograms for optimal detection of prostate cancer
4) Sequential combination therapy to prolong survival of advanced prostate cancer patients
5) Development and establishment of curative and minimally invasive bladder preservation using low-dose chemoradiotherapy plus partial cystectomy
6) Development and establishment of minimally invasive, nonischemic nephron-sparing surgery against kidney cancer
7) Immunotherapy combined with multiple molecular targeted agents against advanced kidney cancer
8) Application of novel MRI imaging protocol to urology
9) Application of serum C-reactive protein as a prognostic marker of urological malignancies and as a marker for surgical invasiveness

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
4. Clinical Services

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 access 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 Article


Review Article


Award


Presentations at International Meetings

1. Staffs and Students
Professor Tetsuya TAGA (December 2008 - )

2. Purpose of Education
Our education has been conducted through the research on elucidation of mechanisms by which multicellular organs, in particular the central nervous and hematopoietic systems, are developed. We have mostly focused on molecular regulation of neural stem cells and hematopoietic stem cells in view of cell-external cues such as cytokines as well as cell-intrinsic programs including chromatin modification. These projects have been performed, for instance by analyzing cross-interactions of transcriptional regulatory signaling pathways, which lead to spatio-temporally coordinated gene expression.

3. Research Subjects
1) Molecular basis for the maintenance of neural stem cells
2) Regulation of neural stem cell fate
3) Characterization of hematopoietic stem cells in fetal hematopoietic organs
4) Characterization of stem-like cells in cancer
5) Epigenetic regulation of neural stem cells

4. Publications
Original Article
Molecular Pharmacology

1. Staffs and Students

Professor: Masaki Noda, M.D., Ph.D.
Associate Professor: Yoichi Ezura, M.D., Ph.D.
Assistant Professor: Tadayoshi Hayata, Ph.D.
MTT Research Instructor: Hiroaki Hemmi, Ph.D.
GCOE Research Instructor: Takuya Notomi, Ph.D.
GCOE International Coordinator: Tetsuya Nakamoto, M.D., Ph.D.
MTT Technical Assistant: Miwa Hayashida
Secretary: Tamano Urata
GCOE Secretary: Yuki Asano, Anna Nakamura
Graduate Students: Kentaro Miyai, Ryo Hanyu, Masashi Nagao, Paksinee Kamolratanakul, Tomomi Nakagawa
Research Students: Smriti Aryal

2. Purpose of Education

Osteoporosis is one of the serious diseases in aging societies in the world. Osteoporosis increases risk of fracture that results in loss of quality of life and threatens life of aged people. Therefore, it is crucial to understand how bone mass is regulated by specific factors to establish the therapy and prevention for osteoporosis. Graduate students will study bone metabolism through journal presentation and investigate bone metabolism using mice and tissue culture system by advanced molecular and cellular biological approaches.

3. Research Subjects

1) Molecular mechanisms of osteoblast and chondrocyte differentiation.
2) Mechanism of regulation of bone mass by nervous system.
3) Regulation of bone metabolism by mechanical stress.
4) Regulation of gene expression by hormones.
5) Molecular biology of function and formation of osteoclasts.

4. Publications

Original Articles


Molecular Cell Biology

1. Staffs

Professor Hiroshi Shibuya
Associate Professor Juniji Ohnishi
Associate Professor (GCOE) Toshiyasu Goto
Assistant Professor Mi-sun Kim
Assistant Professor (MTT) Atsushi Sato
Research Assistant Eriko Ohnishi

2. Purpose of 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.

3. Research Subjects

1) Regulation of TAK1-NLK signaling for anterior formation in *Xenopus* development
2) WNK protein kinases, the causative genes of pseudohypoaldosteronism type II (PHAII) disease

4. Publications

Functional Genomics

1. Staffs and Students (April, 2008)

Professor: Masatoshi HAGIWARA
Associated Professor: Hidenori KUROYANAGI
Guest Associated Professor: Tetsuro HIROSE
Assistant Professor: Akihide TAKEUCHI
Tokunin Assistant Professor: Takayuki NOJIMA, Yasushi OGAWA,
                        Kensuke NIOMIYA
Technicians: Takako IDEUE, Izumi DOBASHI,
              Machiko HORIUCHI
Graduate Students: Hidenobu KAWAMURA, Makoto YAMAMOTO,
                   Genta OHNO, Yousuke NONAKA,
                   Motoyasu HOSOKAWA, Marina TOGO

2. Research Interests

Recent whole genome sequence analyses revealed that a high degree of proteomic complexity is achieved with a limited number of genes. This surprising finding underscores the importance of alternative splicing, through which a single gene can generate structurally and functionally distinct protein isoforms. Based on genome wide analysis, 75% of human genes are thought to encode at least two alternatively spliced isoforms. The regulation of splice site usage, so called “splicing code” provides a versatile mechanism for controlling gene expression and for the generation of proteome diversity. Thus splicing code may play essential roles in many biological processes, such as embryonic development, cell growth, and apoptosis.

3. Research Subjects

1) A Transgenic Reporter Worm System Offers a Path to Alternative Splicing Codes in vivo.
2) Regulating Mechanism of Alternative Splicing and its Physiological Function during the Development of Mouse Brain
3) mRNA Splicing Regulation and Virus Infection.
4) Development of Novel Specific Inhibitors of “PSYCHIK” Family Kinases and their Potentials as Pharmaceutical Drugs

4. Publications

Original articles

1. Staffs and Students (April 2008)

Professor  Fumitoshi ISHINO
Associate Professor Takashi KOHDA
Lecturer Shin KOBAYASHI
Assistant Professor Ryuichi ONO, Shunsuke SUZUKI, Yoichi SEKITA, Hirosuke SHIURA, Daisuke ENDO
Secretary Ikuko MAEDA
Graduate Student Kazuya Matumoto, Masahito IRIE, Mie NARUSE, Hirotaka IWAFUNE, Changshan Wang, Xija XIA, Masayuki ISHII, Sawa IWASAKI, Yuki YAMAGUCHI

2. Purpose of Education

“Epigenetics” coupled with “Genetics” enables us to elucidate several ‘genomic functions’ in inheritance, development and evolution of organisms including our human beings. Genomic imprinting is one of the mammalian specific gene regulation mechanisms 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’. These studies show us how Epigenetics is important in mammalian biology. Our department focuses these mammalian specific genomic functions to elucidate how these genomic functions work and how new genomic functions have been evolved during evolution. Our final goal is to contribute to the 21st’s medicine and human biology by novel understanding of genomic functions.

3. Research Subjects

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.

4. Publications

Original Article

Molecular Oncology

1. Staffs and Students (April, 2008)

Professor: Yasuhiro YUASA
Lecturer: Yoshimitsu AKIYAMA, Hiroshi FUKAMACHI
Visiting Professor: Masabumi SHIBUYA
Tokunin Assistant Professor: Feng WANG, Tsuyoshi OSAWA,
Rika TSUCHIDA,
Secretary: Yoshiko OZAWA, Tomoko NAKAZAWA
Graduate Student: Yumiko SATOU, Takeshi OTSUBO,
Shu SHIMADA, Ayako MIMATA,
Rie WADA, Yutaka HASHIMOTO,
Pichayanoot ROTKRUA, Masashi MURAMATSU

2. Purpose of Education

- Undergraduate course:
  Hygiene is our charge. The undergraduate curriculum of hygiene includes lectures, small-group
  seminars, 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.

- Graduate course:
  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.

3. Research Subjects

1) Cellular and molecular analyses of cancer-related genes, such as oncogenes and tumor suppressor genes, in
   gastroenterological cancers
2) Molecular mechanism of cell growth, differentiation and apoptosis
3) Involvement of differentiation-related genes in gastroenterological diseases
4) Cancer stem cells
5) DNA methylation and cancer
6) Transcription factors and cancer
7) Effect of environmental factors on gene expression and DNA methylation
8) Involvement of microRNA in gastric carcinogenesis
9) Involvement of VEGF receptors in tumor growth and metastasis.
10) Role of macrophages infiltrated into tumor tissues.
11) Importance of bone marrow-derived cells in tumor growth.
12) Mechanism of tumor resistance to anti-angiogenesis therapy.
13) Mechanism of hypertension observed in anti-angiogenesis therapy.

4. Publications

Original Article

2. Otsubo T, Akiyama Y, Yanagihara K, Yuasa Y: SOX2 is frequently down-regulated in gastric cancers and inhibits
   Kawano T, Yuasa Y, Akiyama Y: Methylation of the calcium channel-related gene, CACNA2D3, is frequent and a

Review Article

Hematology

1. Staffs and Students

Professor Osamu MIURA
Junior Associate Professor Ayako ARAI
Assistant Professor Tetsuya FUKUDA, Tetsuya KUROSU, Shihoko WAKABAYASHI
Hospital Staff Keisuke NAKAUCHI, Yutaka MURATA
Emiko YAMAZAKI
Hospital Staff/Graduate Student Manabu OHKI, Gaku OSHIKAWA
Graduate Student Minako JINTA, Toshikage NAGAO, Nan WU

2. Purpose of Education

The major objective of the course is to understand the pathophysiology of blood cells and blood cell-forming organs, and hemostasis, to provide a basis for rational diagnosis and treatment of their disorders. We offer the lectures of basic knowledge of hematological disease for the 4th grade medical students, and we provide the opportunity to study process of diagnosis and management of hematological disorder for the 5th and 6th grade medical students as clinical clerkship, CC1 and CC3.

In our clinical residency the junior resident can have the opportunity to get knowledge and skill for dissolving hematological, oncological and infectious problem.

The senior residents are making profound efforts in their clinical experience to be hematological experts.

3. Research Subjects

1) Cell signaling for the hematopoiesis and hematological oncogenesis
2) Molecular mechanism of lymphomagenesis
3) Regulation of hematopoietic cell death after chemotherapeutic reagents
4) Mechanism of resistance against tyrosine kinase inhibitors

4. Clinical Services

We provide the highest quality of patient care for a wide spectrum of illnesses related to blood diseases and cancer.

5. Publications


2. A variant-type MLL/SEPT9 fusion transcript in adult de novo acute monocytic leukemia (M5b) with t(11;17) (q23;q25).

3. Antisera induced by infusions of autologous Ad-CD154-leukemia B cells identify ROR1 as an oncofetal antigen and receptor for Wnt5a.

4. Functional analysis of cytomegalovirus-specific T lymphocytes compared to tetramer assay in patients undergoing hematopoietic stem cell transplantation.


6. Negative feedback regulation of colitogenic CD4+ T cells by increased granulopoiesis.
7. Treatment of adult AML with t(6;11)(q27;q23) by allogeneic hematopoietic SCT in the first CR.


Clinical and Molecular Endocrinology

1. Staffs and Students (April, 2008)
Professor Yukio Hirata
Associate Professor Masayoshi Shichiri
Lecturer Isao Uchimura
Assistant Professor Takanobu Yoshimoto, Masaru Doi, Hajime Izumiyama
Resident Ryuji Koyama, Kyoichiro Tsuchiya, Atsuko Miyake, Miho Sugiyama, Mina Yamaguchi, Jun Watanabe
Graduate Students Tae Nakano, Kiichiro Hiraishi, Naoko Sekizawa, Yuji Tani, Eri Hayakawa, Itaru Akaza, Noriko Suzuki, Chisato Nakayama, Yoshihiro Yamazaki, Yuko Tateishi, Takako Asano, Masako Kato
Research Students Munehiro Ikebukuro, Koji Hagiwara
Secretaries Kimie Takano, Yasuko Tsuchiya

2. Purpose of Education
Our training program enables postdoctoral trainees to prepare for future academic careers and 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 results in the field of cell 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.

3. Research Subjects
1) Physiological and pathophysiological role(s) of vasoactive hormones
2) In-silico analysis of novel bioactive peptides
3) Mechanism of insulin resistance and atherosclerosis in diabetes and metabolic syndrome
4) Mechanism of pathogenesis in endocrine tumors
5) Novel diagnostic development in endocrine and metabolic diseases

4. Clinical Services
Comprehensive inpatient and outpatient services in the area of endocrine and metabolic disorders, including:
• diseases of the thyroid, pituitary and adrenal glands.
• diabetes mellitus, diabetic complications, metabolic syndrome, and obesity
• primary and secondary hypertension
• abnormalities in calcium regulation

5. Publications
1) Peer-reviewed Journal


2) Review


3) International Meeting


1. Staff and Student

Professor: Masataka NAKAMURA (Director)
Junior Associate Professor: Kiyoshi OHTANI
Assistant Professor: Toshifumi HARA
Postdoctoral Fellow: Mizue OHKUMA
Graduate Student: Masanori MURAKAMI (~March),
Terumi MIZUKOSHI, Mariko MIZUGUCHI,
Ryutaro OHBA (April~), Yating WANG (October~),
Shigeru HASUNUMA (April~)

2. Purpose of Education

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. Research Subject

1) Molecular mechanism of tumorigenesis by human T-cell leukemia virus type I (HTLV-I).
2) Roles of the transcription factor TWIST in cell differentiation.
3) Implication of prostaglandin D2 receptor (CRTH2) in allergy reactions.

5. Publications

Original Article

Book
Drug Design Chemistry (Molecular Design)

1. Staffs and Student
Assistant Professor Shigeru Ito
Tokunin Associate Professor Akiko Sugimoto
Graduate Student Gao Pei, Yuto Kawahara,
Yuka Saishu, Aya Suzuki,
Yuki Yamada

2. Purpose of Education
Drug Design Chemistry is a branch of Pharmaceutical sciences, especially focus on novel drug development through organic chemistry, analytical chemistry, biochemistry and related fields. We provide these subjects, lectures and laboratory practice, to graduate students.

3. Research Subjects
1) Elucidation and application of antioxidant system in vivo
2) Chemical studies and development of drug discovery of bioactive substances
3) Research on drug discovery of the inflammatory bowel diseases
4) Study on amino sugar derived substances related to diabetes and its complication
5) Relation of physical properties and 3 dimensional molecular structures of drugs

4. Publications
Gene and Molecular Medicine

Medicinal-Chemical Biology (Molecular Recognition)

1. Staffs and Students (April, 2008)

Professor Hirokazu TAMAMURA
Assistant Professor Hiroshi TSUTSUMI Wataru NOMURA
Research Staff Kyoko ITOTANI
Secretary Naoko HIRAGA
Research Student Kentaro FUKUMOTO, Yuko YAMADA
Graduate Student Yuka INABA, Toru A OKI, Nami OHASHI, Shintaro SUZUKI, Tomohiro TANAKA, Seiichiro ABE, Mai KATO, Hiromi KUBOTA, Yuta SAKAMAKI, Yuki SERIZAWA, Toru NAKAHARA, Masaki HASEYAMA, Aki OYA, Chihiro OCHIAI, Sayaka KAGAWA, Jun SATO, Yoshiaki OKUDA, Yuta NAKANISHI, Chie HASHIMOTO, Akemi MASUDA, Tomoaki MINO, Takayuki YANAGISAWA

2. Purpose of Education

Our department teaches chemical biology targeted to elucidation and regulation of biological phenomena based on organic chemistry and advanced synthetic chemistry, medicinal chemistry and advanced drug discovery of a post-genome era. Our department performs periodically journal clubs and research progress meetings.

3. Research Subjects

2) Development of bio-probes, bio-sensing, medicinal chemistry towards chemical biology.
3) Structural analysis of the interactions between nuclear receptors/ enzymes and their ligands.
4) Development of applications of zinc finger protein for gene therapy and nano technology.

4. Publications

Original Article


Review Article

1. Tamamura H, Tsutsumi H, Nomura W, Tanaka T & Fujii N. A Future Perspective on the Development of

Book
Genetic Regulation

1. Staffs and Students (April, 2008)

Professor Akinori KIMURA
Associate Professor (School of Biomedical Science) Toshiaki NAKAJIMA
Assistant Professor Takuro ARIMURA
Research Associate Taeko NARUSE
Graduate Student Daisuke SHICHI
Graduate Student (Biomedical Science PhD program) Minako ABE, Kunihiko HINOHARA, Hitoshi OHTANI, Risa YANAGIDA
Visiting Graduate Student Zhiyong CHEN
Visiting Student Jianbo ANN, Yukiko OKUDA

2. Purpose of Education

Genetic factors, i.e. structural and/or functional diversity of human genome, are more or less 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 cardiovascular diseases (e.g. idiopathic cardiomyopathy, idiopathic arrhythmia, and coronary heart disease), autoimmune diseases (e.g. Burger disease, Behcet disease, rheumatoid arthritis, and chronic thromboembolic pulmonary hypertension) and infectious diseases (e.g. HIV/AIDS and HCV). In addition, genome diversity in immune-related genes is investigated from the view-point of primate evolution.

3. Research Subjects

1) Identification and functional analysis of disease-related genes for cardiovascular diseases
2) Identification and functional analysis of disease-related genes for autoimmune diseases
3) Identification and functional analysis of disease-related genes for infectious diseases
4) Structural, functional and evolutilional analyses of MHC and immune-related genes in vaccination

4. Publications

Original Article


Review Article
Bioinformatics

1. Staffs and Students

Professor: Hiroshi Tanaka
Associate Professor: Yoshitomo Niimura
Assistant Professor: Soichi Ogishima
Project Associate Professor: Hiroshi Mizushima, Fengrong Ren, Shinji Tanaka
Project Lecturer: Kazuo Shimokawa, Kanae Oda
Project Assistant Professor: Takeshi Hase, Naoki Hasegawa, Kaei Hiroi, Keisuke Ido, Mayuko Ishikawa, Yansen Mahmut, Kaoru Mogushi, Wataru Ohashi, Satoshi Shoji, Masao Umayabashi

Visiting Professor: Hiroki Nogawa
Visiting Assistant Professor: Isao Yamaguchi
Technical Staff: Masaya Itoda, Ken Miyaguchi, Shota Nemoto

2. Purpose of Education

Prof. Tanaka is charged with education of interdisciplinary medical informatics and bioinformatics. For undergraduate classes he educates “Clinical Informatics”, “Statistics for Health Science”, “Practice in Clinical Informatics II”, “Project Research”, and “Basics of Clinical Informatics”. For graduate classes he educates “Computational Biology”, “Bioinformatics Computation”, “Systems Pathology”, “OMICS-based Drug Discovery and Development”, “Statistical Genetics and Medical Statistics”, “English Debate”, and “Practice in Global Linkage between University and Industry”. He supervises 27 students of PhD course and 3 students in Master course in Graduate School of Medical and Dental Sciences and 10 students of PhD course and 10 students in Master course in Biomedical Science PhD Program. He is a principle...
investigator of “Global Linkage Program between University and Industry” granted by Support Program for Improving Graduate School Education. This program provides students with internship opportunities at international business firms to see real-world examples and global trends so as to envisage future needs. This program also provides students with specialist consultations which support them to define their career objectives. He is also a principle investigator of “International Educational Program for Interdisciplinary Disease Science” granted by Program for Accelerating Internationalization of Higher (University) Education. This program will form a global alliance of higher education institutes in Europe, the United States, and Asia and develop international cooperation education of the Double-degree Program (5-year PhD course). This program has established university alliances with Heidelberg University, Glasgow University, Dundee University, Peking University, Peking Union University, China Medical University, Fudan University, Hanoi Medical University, Ochanomizu University, and Kitasato University, sharing the philosophy of interdisciplinary disease science. He is also a principle investigator of “Educational Program for Biomedical Omics Information Scientists” granted by Special Coordination Funds for Promoting Science and Technology. This program offers study opportunities to clinical doctors and medical technologies in learning about integration of life science and informational science into practical applications in medicine. This program also educates bioinformatists who have been active in their field and are planning to diversify their activities into medical science, offering them basic and practical knowledge in clinical medicine and drug discoveries.

3. Research Subjects

In our laboratory, we conduct biological and medical researches from the viewpoint of Systems Biology.

Biological sciences: Recently, the whole genome sequences of diverse organisms have become available. Moreover, various “omix” information such as a proteome, transcriptome, and metabolome are currently accumulating. Our goal is to establish a grand-theory of biological sciences from the viewpoint of “evolving networks composed of biological molecules” by integrating omix information.

Medical sciences – Genomic and omix data are also utilized in the field of medicine. It has been revealed that most diseases are caused by the interaction among abnormalities of multiple genes, those at the tissue level, and environments. It is therefore possible to consider diseases as a system. From this standpoint, we try to establish the omix-based medicine.

(1) Integrated Clinical Omics Database Open to the Public

We are developing new OMICS based database for clinical research by integrating OMICS information and comprehensive clinical information. We are currently collecting hepatic, colon, and oral cancer. We have developed “Clinical Omics Database System (iCOD)” to store and analyze clinical omics data, which facilitates the understandings of relations between omics data and clinical data. This database has three components, 1) Primary database for anonimized data storage, 2) Secondary Database for research and analysis, 3) Tertiary database for publication. Publication database server can be accessed through the internet (http://omics.tmd.ac.jp/). Although it is currently only in Japanese, English version will be released in 2009. In this database, the relationship is visualized as a network with three layers, clinical, pathological and omics layer, for each case. This would be the first public integrated clinical database including clinical information and molecular biological information. The target for this research is to realize “OMICS based Medicine” and to understand the relation between pathobiology and clinical outcome.

(2) Omics-based Analysis of Hepatocellular Carcinoma

Gene expression profiling using microarray analysis has been widely used in biomedical research. Because microarray technique simultaneously detects expression levels for thousands of genes, interpretation of such large-scale data is still a challenging task. Therefore, microarray data is often examined using the information of a pathway as well as protein-protein interaction (PPI) network. In this research, we aimed to develop a novel method to identify disease-specific network in order to establish biomarkers for early detection of hepatocellular carcinoma.

One hundred and sixty-eight cases of primary HCC specimens were obtained from surgically resected materials. Eighty-one patients showed portal vein invasion (vp), and 87 patients did not show vp. We examined differently expressed genes using KEGG PATHAY, and we observed significant upregulation of cell proliferation, as well as downregulation of hepatic metabolism such as biosynthesis of complement, fatty acid, and cytochrome P450. Furthermore, we constructed vp-specific molecular networks using PPI information and identified genes related to mitosis such as Aurora kinase A/B and Survivin, which were not included in KEGG PATHWAY.
(3) Systems biology and evolution

Accumulating vast amounts of omics data, a new filed called “systems biology” proceed to aim system-level understanding of life, and we work on analysis of both evolution and dynamics of biological systems. (1) Evolutionary analysis, which we call “systems evolutionary biology”, is to understand the evolution of life not only as gene evolution but also as systems evolution. We study evolution of i) Hox signaling system (developmental system) and ii) yeast protein interaction network (signaling system). In the former work, we inferred transcriptional network regulated by Hox proteins, and then we conduct preliminary analyses of evolution of it. In the latter work, we showed modularity as an evolutionary constraint on yeast protein interaction network. (2) On the other hand, dynamical analysis is to understand systems behavior. To aim transcriptional mechanism-based understanding of microarray data, we developed a novel method of trend analysis and a visualization system of hierarchical network model.

(4) Evolutionary Dynamics of Olfactory Receptor Gene Families in Mammals

Odorant molecules in the environment are detected by olfactory receptors (ORs). OR genes form the largest multigene family in vertebrates. So far we have identified the entire repertoires of OR genes from the genome sequences of various species, revealing that OR gene families have dynamically changed during evolution depending on each species’ living environment. In 2008, we have conducted a detailed comparative analysis of OR genes between humans and chimpanzees as a collaboration with Dr. Yasuhiro Go in the Primate Research Institute (Go & Niimura, 2008). We found that the number of OR genes (~810) and the fraction of pseudogenes (51%) are very similar to those in humans. These observations are in sharp contrast to the previous studies, in which humans were believed to have a poorer sense of smell than chimpanzees. Moreover, the most recent common ancestor between humans and chimpanzees were estimated to have a larger number of functional OR genes and a lower fraction of pseudogenes than its descendents, suggesting that the OR gene repertoires are in a phase of deterioration in both lineages. We also showed that ~25% of their functional genes are species-specific, implying that the spectrum of detectable odorants might be quite different between them.

(5) Intelligent Patient Care and Health Care Policy

We are handling several areas in Medical Informatics within our laboratory. We have been designing ubiquitous computer network in the hospital to establish an error free and effective environment at the bed side for the nurse, as it is the most essential point of care in the hospital. We are using active RFID tags to monitor the movement of individuals, and passive tags to confirm the equipment or drugs. Prof. Nakaya has been working for standardization of medical terminology, and is a member and section chair of ISO committee. We also have research field in the medical informatics policy (comparison of medical informatics system between countries, national doctor distribution), assessment of clinical trials, proposal of effective clinical trial with genomic information, web-based health consultation system, and effect of music for dementia.

4. Publications

[Original Articles]


[Reviews]

[Books]
1. Tanaka H. Bioinformatics and Genomics for Opening New Perspective for Personalized Care. “eHealth: Combining Health Telematics, Telemedicine, Biomedical Engineering and Biinformatics to the Edge” (B.Blobel et al. eds.). IOS press, 47-58, 2008
Applied Genetics

1. Staffs and Students (April, 2008)

Professor         Yoshio MIKI
Associate Professor Kiyotsugu YOSHIDA
Assistant professor Katsuya TAKENAKA
Graduate Student  Xia YUN, Hui Feng WANG, Zheng Guang LU, Junko KIMURA, Hew Hoi CHIN, Nadila WALL, Sadiya MARIKU
Research Student  Azumi ITO, Ikumi OKU

2. Purpose of 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.

3. Research Subject

1) Functional analysis of the BRCA2 gene.
2) Regulatory mechanisms of tumor cells in the apoptotic response to DNA damage
3) Analyses of molecular domains of translesion DNA polymerases by introducing a point mutation by homologous recombination in vertebrates.

4. Publication

Original Article


Review Article

Molecular Cytogenetics

1. Staffs and Students (April, 2008)

Professor Johji Inazawa M.D., Ph.D.
Associate Professor Issei Imoto M.D., Ph.D.
Tokunin Associate Professor Ken-ichi Kozaki D.D.S., Ph.D.
MTT Lecturer Takeshi Matsui Ph.D.
Assistant Professor Sana Yokoi M.D., Ph.D.
Tokunin Assistant Professor Jun Inoue Ph.D.
Tokunin Assistant Professor Shin Hayashi M.D., Ph.D.
Research Assistant Ayako Takahashi, Rumi Mori
Secretary Yuko Shinozaki, Yoriko Fukukawa
Graduate Student Shozo Honda, Bai Hua,

Research Student Ryoko Kikuchi, Shuhei Komatsu,

2. Purpose of Education

The principal aim of Department of Molecular Cytogenetics is to understand the molecular mechanism underlying intractable diseases, such as cancer and uncharacterized genetic diseases. Main objective of Department of Molecular Cytogenetics 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. Research Subjects

1. Identification of genes responsible for intractable diseases including cancer and genomic disorders through integrative genomics and epigenomics.
2. Development of innovative techniques for genomics and epigenomics in medical science.
4. Molecular mechanisms involved in stratified epithelial differentiation and cancer progression.

5. Publications

Original Article

Okanoue T: Activation of B-Myb by E2F1 in hepatocellular carcinoma. Hepatol Res. 38:886-95, 2008
1. Staffs and Students (April, 2008)

Professor Shigetaka Kitajima MD, PhD
Associate Professor Yujiro Tanaka MD, PhD
Assistant Professor Mimi Adachi MD, PhD,
Secretary Kuniko Takayanagi
Graduate Student Kazuhiko Yamada, Liu Qin,
Aya Nakamura, Shinichiro Asano,
Research Student Yuriko Hosaka

2. Purpose of Education

Transcriptional regulation is one of the most important processes by which genome information is expressed from DNA to mRNA to protein. The faithful synthesis of mRNA is achieved by transcriptional machinery comprised of RNA polymerase II, basal factors and many other protein factors, whose dysfunction is implicated in various human diseases. Our research interest is focused on the basic mechanism of transcription cycle and implication of early response transcription factors in determining cell fate in stress response. We are also studying on the mechanism of cell cycle arrest of terminally differentiated cardiac cells and its re-activation to provide novel regeneration therapy.

Key words
・To provide novel paradigm of transcriptional regulation
・To understand role of transcription factor in cell fate determination
・To innovate novel in situ regeneration therapy of heart

3. Research Subjects

1) Transcription cycle of basal transcription
2) Biological role of transcription elongation factor Elongin A
4) Mechanism of cell cycle arrest in terminal differentiation of cardiac cells and its re-activation in vivo and in vitro

4. Clinical Services

none

5. Publications

Original Article
1. Staffs and Students (April, 2008)

Professor   Shigeki Arii
Tokunin Associate Professor Shinji Tanaka
Assistant Professor Koji Ito, Noriaki Nakamura,
Atsushi Kudo, Toshiaki Kurokawa,
Norio Noguchi
Tokunin Assistant Professor Yasen Mahmut
Graduate Student Yoko Zui, Daisuke Ban,
Keisuke Minamimura, Arihiro Aihara
Yusuke Mitsunori, Satoshi Matsumura,
Ayan Murakata, Rama Adikrisna,
Kenichiro Yoshitake, Syunsuke Muramatsu,
Xirali Mamat, Maynur Abdurahman

2. Educational Vision

Medical School Education: Our mission is to educate students and transform them into high quality surgeons. Leading edge training, from basic to advanced, is provided through one-on-one interaction with advisers. Furthermore, students, as medical professionals, learn how to interact with patients, and establish strong ethics and morals. Especially, in regard to breaking bad news, students learn by dealing with real cases. While students mainly acquire surgical techniques during post-graduate clinical internships, their interest in surgery is nurtured through medical education.

Post-graduate Education: Our mission is to cultivate the capability of students as surgeons and physicians, in order to provide the highest quality patient care. Each student is expected to obtain a specialization in surgery within 5 or 6 years after graduation from medical school. During post-graduate education, we provide incentives for students to become excellent surgeons, conduct original medical research, and allow them to demonstrate their capability in the real world.

3. Research

We are making researches in the important issues which are remained to be resolved in the hepato-biliary-pancreatic surgery and diseases. The research subjects are as follows;

1) Research in the molecular mechanisms on the progression of hepato-biliary-pancreatic malignancies
2) Research in development of the molecular-targeting therapy for hepato-biliary-pancreatic malignancies.
3) Research in the extended indication of the hepatic resection for hepato-biliary malignancies.
4) Research in the transporter for bile metabolism
5) Research in the improvement of liver preservation
6) Research in the microcirculation of the liver
7) Research in immunological tolerance for organ transplantation
8) Research in technical improvement of laparoscopic surgery

4. Clinical practice

The major diseases we treat are those of liver, biliary tract including gallbladder, pancreas, and spleen, particularly malignant diseases of those organs. Especially, our mission is to treat advanced cancers with multidisciplinary strategy although our mainstay is surgical method. Living liver transplantation is also undertaken for end-stage liver diseases. Laparoscopic surgery is applied to neoplastic diseases as well as benign diseases from the viewpoint of less invasive surgery. The malignant cases we resected was 140 on 2007, which was ranked among high volume centers of our country.

5. Publications

Original Article

Okanoue T. CREB3L4, INTS3, and SNAPAP are targets for the 1q21 amplicon frequently detected in hepatocellular carcinoma. Cancer Genet Cytogenet 180:30-36, 2008


Review Article


A case report


International Presentation


3. Baba H, Honda G, Kurata M, Tsuruta K, Okamoto A. Pancreatic cancer patients surviving five or more years after...
Orthopaedic and spinal surgery

1. Staffs and Students (April, 2008)

Professor
Kenichi SHINOMIYA

Junior Associate Professor
Tetsuya JINNO, Yoshiyasu ARAI

Assistant Professor
Yoshinori ASO, Yoshiaki WAKABAYASHI, Shigenori KAWABATA, Keisuke AE, Tsuyoshi KATO

Graduate Student
Daisuke KOGA, Toshiki YOSHII, Makiko IWASAKI, Tabu GOKITA, Hidetsugu MAEHARA, Hirota KKOYANAGI, Senichi ISHII, Masaki TOMORI, Hiroki YAMAUCHI, Hiroyuki INOSE, Kazuo KUSANO, Yumi SUGATA, Koji FUJITA, Tomokazu MASAOKA, Kyohei SAKAKI, Takashi HIRAI, Masato YUASA

Regenerative Therapeutics for Spine and Spinal Cord
Associate Professor
Shinichi SOTOME, Shu TAKEDA

Junior Associate Professor
Mitsuhiro ENOMOTO

2. Activities

As a department of orthopaedic surgery, we execute medical treatment, research, and education in cooperation with section of Orthopaedic Joint Surgery. Orthopaedics treats with various disorders of musculoskeletal systems and nervous systems such as bone, cartilage, joint, tendon, muscle, spinal cord and peripheral nerves. And the disorders include not only trauma, but also degeneration, neoplasm, and systemic disease. Thus our research should be extended wide area of basic and clinical fields. Now our research projects include reconstruction of motor function, clinical application of regenerative medicine, development of biomaterials and artificial joints, and pain control.

(1) Research Subjects

1) Development and evaluation of a novel artificial bone – porous hydroxyapatite / collagen composite
2) Reconstruction of bone defects using bone marrow stromal cells and artificial bone substitutes
3) Reconstruction of bone defects using bone morphogenetic proteins and artificial bone substitutes
4) Analysis of the mechanisms of spontaneous resorption of herniated disc and clinical application
5) Determination of responsible genes for degenerated intervertebral disc
6) Clinical applications of spinal cord evoked potentials
7) Development of novel diagnostic method for spinal cord function
8) Development of cell therapy to repair injured spinal cord
9) Development of gene therapy and artificial nerve to repair injured peripheral nerve
10) Development of multidisciplinary therapy for musculoskeletal malignant neoplasm
11) Reconstruction of motor function after musculoskeletal tumor resection

(2) Clinical Services

By popularity of sports and aging society, the need for orthopaedic medicine is growing rapidly. We carry out not only treatment of the disease but also repair of functional disability for the improvement of QOL by advancing therapeutic strategy. In spinal operation, instrumentation, microscopic or endoscopic surgery and spinal cord monitoring yield safety and secure decompression and fusion, resulting early postoperative ambulation and satisfactory outcome.

Hand and upper limb surgery unit has applied microsurgical technique for atraumatic operation and micro-vascular anastomosis. Today, microsurgery is indispensable for re-implantation, nerve repair and transfer, and vascularized tissue transfer. Arthroscopic surgery in upper limb is also available, and provides less-invasive operation.

In musculoskeletal tumor surgery, limb-salvaging surgery is the first choice based on the concept of safety surgical
margin from the systematic evaluation of surgical specimens. And also functional reconstruction of the affected limb after tumor surgery is exerted by plastic and microsurgery technique and application of regenerative medicine. Examples of advanced treatments for adult hip diseases are one-stage bilateral total hip arthroplasty, less-invasive technique for adult hip reconstruction, and accelerated rehabilitation after hip arthroplasty.

(3) Education

The faculty in the department is responsible for assisting graduate students to develop the professional research, teaching and skills for both clinical and basic science in the field of orthopaedic surgery. Morning conferences are held three times a week, and special guest lectures are sometimes provided to have up-to-date information. We are participating in center of excellence program, frontier research on molecular destruction and reconstruction of tooth and bone in Tokyo medical and dental university and providing leaning environment for the students.

For first year orthopaedic residents, the annual meeting is held to discuss clinical and basic research with the faculty outside of Tokyo. Furthermore, we provide several open meetings and many orthopeadic surgeons join educational lectures to study recent clinical application by special guest or oral presentation of case reports by the residents.

3. Publications

Original Article


3. Sato, S; Kimura, A; Ozdemir, J; Asou, Y; Miyazaki, M; Jinno, T; Ae, K; Liu, XY; Osaki, M; Takeuchi, Y; Fukumoto, S; Kawaguchi, H; Haro, H; Shinomiya, KI; Karsenty, G; Takeda, S:The distinct role of the Runx proteins in chondrocyte differentiation and intervertebral disc degeneration - Findings in murine models and in human disease. ARTHRITIS AND RHEUMATISM. 58(9):2764-2775,2008.09.


5. Tomizawa, S; Kawabata, S; Komori, H; Fukuda, YH; Shinomiya, K; Evaluation of segmental spinal cord evoked magnetic fields after sciatric nerve stimulation. CLINICAL NEUROPHYSIOLOGY. 119(5):1111-1118,2008.05.

6. Itoho, H; Asou, Y; Hara, Y; Haro, H; Shinomiya, K; Tagawa, M:Enhanced type X collagen expression in the extruded nucleus pulposus of the chondrodystrophic dog. JOURNAL OF VETERINARY MEDICAL SCIENCE. 70(1):37-42,2008.01.


Review Article

Surgical Pathology

1. Staff and Students

Professor
Yoshinobu EISHI

Associate Professor
Takumi AKASHI

Assistant Professor
Tohru IGARI, Jiro KUMAGAI, Takashi ITO

Hospital Staff Doctor
Keiko MIURA, Takashi ENDO

Secretary
Mari KOIKE

2. Purpose of education

Main object of surgical pathology in the course of graduate school is to provide medical students opportunity to study 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.

3. Research Subjects

1) Improvement of diagnostic methods of gastrointestinal, liver, renal and respiratory diseases by anatomical, immunohistochemical, microbiological and molecular technologies.

2) Analysis of the pathophysiology of the disease, especially invasion mechanism of lung and gastrointestinal cancers by molecular biological technology.

4. Clinical Services

In cooperation with departments of human pathology and comprehensive pathology, department of surgical pathology provides autopsy services (100 case in a year), cytopathology services (12,000 cases in a year) and surgical pathology (10,000 cases in a year) for the clinicians of the affiliated hospital. Diagnosis is mostly done by the organ-specialized staffs. Clinico-pathological conferences are held more than one hundred times in a year.

5. Publications

Original Article


Book Review Article


Others (Prize)

1. Ito T. Helicobacter pylori invades the gastric mucosa and translocates to the gastric lymph nodes. The 14th Annual Meeting of Japanese Society for Helicobacter Research Award, Uehara H. pylori Award -The Most Excellent-KOBE, 2008.
Medical Technology (Biomedical Devices and Instrumentation)

1. Staffs and Students (April 2008)

Professor Kohji MITSUBAYASHI
Junior Associate Professor Hiroyuki KUDO
Assistant Professor Hirokazu SAITO
Lecturer (part-time) Yuji OHTA
Engineer Official Kumiko MIYAJIMA
Research Staff Hidetaka ISHIMARU
Graduate Student Xin WANG, MingXing CHU,
Tomoko GESSEI, Elito KAZAWA,
Ryodai KATO, Yuki SUZUKI
Research Student Takuhiro OMI

2. Education

We provide opportunity to study advanced biomedical devices and instrumentation. Students in our laboratory are working on the research projects as follows.

3. Research Subjects

1) Wearable chemical sensors for biomedical measurements

Flexible and biocompatible biosensors have been fabricated by using Soft-MEMS technology on functional polymer membrane, thus applying to non-invasive approaches of physical monitoring (i.e. transcutaneous gas monitoring and tear glucose measurement).

2) Biological odor measurement and smell communication

High selective gas-sensors - "Bio-sniffers" - have been constructed with biological recognition materials such as drug-metabolizing enzyme in human liver. Potential applications of the bio-sniffer and nose includes halitosis analysis, breath alcohol & aldehyde measurement, VOC sensing as environmental assessment, odorless chemical digital-code (watermark) system, smell informatics, etc.

3) Ubiquitous monitoring of biological information by using IT devices

Mobile human-monitoring system for vital signs has been constructed using cellular communication service and body-wired techniques.

4) Novel biological devices based on new driving principle with chemical energy

Bio-devices with high performance in electrical and mechanical properties have been investigated using functional biopolymer such as DNA, protein, lipid and sugar chain.

4. Publications

Original Article


Medical Instrument (Biomedical Information)

1. Staffs and Students (April, 2008)

Professor Kenji YASUDA
Associate Professor Tomoyuki KANEKO
Assistant Professor Ikurou SUZUKI
Tokunin Junior Associate Professor Hideyuki TERAZONO
Tokunin Assistant Professor Fumimasa NOMURA, Masahito HAYASHI
Graduate Student Tomonari KOUGUCHI, Yuki TOMOE, Sachie OHHARA

2. Purpose of Education

Medical instrument (Biomedical information) is a branch of institute of biomaterials and bioengineering which deals with the measurement of epigenetic information and memorization stored in living system such as brain (neural network system), immune system, and cardio systems caused by environmental hysteresis. Main objective of medical instrument in the graduate course is to provide students opportunity to study fusion of latest technologies of nano- and bio-tech, and to develop artificial organ model on chip for drug discovery and toxicology use.

3. Research Subjects

1) Studies on Epigenetic Information Stored Living System.
3) Bio-computing using “Real Neural Network on Chip”.

4. Publications

Original Articles

Meetings
Artificial Organs Engineering (CardioVascular Device Engineering)

Professor Setsuo Takatani
Assistant Professor Mariko Kobayashi
Adjunct Instructor Tadahiko Shinshi
Adjunct Instructor Hiroyuki Tanishiro
Adjunct Instructor Toshiyuki Yasuda
Research Associate Satoshi Waguri
PhD Graduate Student Yoshimasa Yokoyama
Master's Graduate Student Naoyuki Yokoyama

In our department, we are focusing on research and development of mechanical circulatory support devices and providing opportunities to learn state of the art treatment methodologies for profound heart failures requiring advanced treatment beyond the capabilities of the surgical and cardiology intervention.

(1) Education

Provide opportunities to learn treatment modalities for profound heart failure patients including mechanical circulatory support devices, both assist and replacement systems, circulatory maintenance with artificial hearts, clinical applications of artificial hearts and new technologies on the horizon.

(2) Research

a. Research and Development of Advanced CardioVascular Devices: Advanced mechanical circulatory support devices applicable from infants to adults, from extracorporeal to implantable systems will be researched and developed to treat end-stage heart failure patients. Through CAD/CAM design and precision machining, in vitro performance and durability testing, and ex vivo and in vivo biological performance studies, clinically applicable devices will be obtained.

b. Basic Research on Cell Biomechanics, Biorheology, and Thrombosis Studies: The research focuses upon blood cells and device interaction, specifically mechanical effects of the cardiovascular devices upon blood cell elements including RBCs, WBCs and platelets, cell aggregation and adhesion phenomena, lysis and coagulation process on the artificial surface. The study will lead to understanding of mechanism leading to hemolysis, coagulation in the cardiovascular devices to attain biocompatible devices.

c. Research and Development of Sensors and Control Algorithm: This study aims at development of sensors for cardiovascular dynamics measurement and possible application in controlling the artificial organs. The optical interaction with blood cells, tissues and organs will be investigated to develop an appropriate sensing technique and sensors. This study will be conducted in connection with the basic research of (2) to understand mechanical effects of blood pumps upon blood cell elements leading to hemolysis and arteriosclerosis process. In relation to understanding the recovery process of myocardium during ventricular unloading with the mechanical circulatory devices, a semi-conductor micro-pressure sensor that can used for prolonged duration in biological environment will be researched and developed.

d. Research and Development of Optimal Methods for Promoting Myocardial Recovery, Understanding of Recovery Process and Next Generation Devices: Aiming at understanding recovery process of myocardium during mechanical unloading, this study constructs a global model of cardiovascular system covering from molecular level to organ level. Next generation optimal therapy by combining mechanical circulatory support device with regenerative medicine, cell transplantation and pharmaceutical regimens will be researched.

Peer Reviewed Journal Publications


**Review, Book Chapter**


**Internation Conference Presentations**

**Invitation**


**General**


Department of Pharmacovigilance

1. Staffs and Students (April, 2008)

Professor: Masayoshi Harigai
Associate Professor: Ryuji Koike, Toshihiro Nanki
Assistant Professor: Michi Tanaka, Yukiko Komano
Graduate Student: Ryoko Sakai
Secretary: Reiko Watanabe

2. Purpose of Education

Department of Pharmacovigilance has established since 2005 and dedicated to pharmacovigilance activity in the field of rheumatology. Main objective of Department of Pharmacovigilance in the graduate course is to provide students opportunity to study basics of pharmacoepidemiology including clinical statistics and to implement an epidemiological study in pharmacovigilance using some databases which have been maintained by this department.

3. Research Subjects

1. Registry of Japanese Rheumatoid Arthritis Patients on Biologics for Long-Term Safety (REAL study)
2. Safety of Biologics in Clinical Use in Japanese Patients with Rheumatoid Arthritis in Long-Term (SECURE study)
3. Observational study of pulmonary infections in patients with rheumatic diseases receiving immunosuppressive therapy
4. Retrospective study of pulmonary complications in patients with rheumatic diseases
5. Pneumocystis pneumonia in patients with rheumatoid arthritis receiving etanercept

4. Clinical Service

All Members of Department of Pharmacovigilance are rheumatologists and engaged in clinical services in the field of rheumatology as specialists.

5. Publications

Original Article

Department of Clinical Laboratory

1. Staffs
   General Manager (Junior Associate Professor)  Naoko Tojo
   Associate Manager (Associate Professor)     Shuji Tohda
   Assistant Professor                       Naomi Murakami
                                                  Tadashi Kanouchi
                                                  Hitoshi Saeki (From January to March, 2008)
                                                  Ryoko Azuma (From April to December, 2008)

2. Purpose of Education
   Main purpose of education of the department is to provide students opportunity to study clinical laboratory medicine
   and medical technology. The staffs lecture on clinical laboratory medicine and give technical training of clinical laboratory
   tests to not only medical students and medical technologist students in the faculty of medicine of the university but also
   students in the another vocational schools for medical technologists. Two residents of the medical hospital of university
   were also trained mainly for ultrasonography but for general laboratory medicine.

3. Research Subjects
   1) Evidence based laboratory medicine
   2) Standardization of respiratory function tests.
   3) Development of molecular diagnostic tests for hematological diseases.
   4) Development of electrophysiological diagnostic methods and technology for peripheral neuropathies.
   5) Development of diagnostic methods and technology using transcranial magnetic stimulation.

4. Clinical Services
   Clinical laboratory is doing speedy, high quality and advanced laboratory tests all day all the time. In the night time, the
   tests for blood transfusion are also done and appropriate blood products are provided from the laboratory in cooperation
   with blood transfusion service of the hospital. Smear test for tubercle bacillus and cell counting of the cerebrospinal fluid
   was added to the emergency testing items. This year, the machinery for emergency inspection and the ultrasonic
diagnostic equipments were updated and all the reports of ultrasonography came to be provided online. The information
   on the sensitivity to antibiotics of pathogens is also online provided to every ward.

5. Publications
   Original Article
   1. Irioka T, Akaza M, Nakao K, Kanouchi T, Yokota T, Mizusawa H. Chiasmal optic neuritis following mumps
      cells by Wnt3A. Anticancer Research 2008; 28: 2701 - 2704.
      - 1250.
      Yagita H, Watanabe M. Negative feedback regulation of colitogenic CD4+ T cells by increased granulopoiesis.
      Inflamm Bowel Dis 2008; 14: 1491 - 1503.
   6. Nishina K, Unno T, Uno Y, Kubodera T, Kanouchi T, Mizusawa H, Yokota T. Efficient In Vivo Delivery of siRNA to
      the Liver by Conjugation of a-Tocopherol. Molecular Therapy 2008; 16(4): 734 - 740.
1. Staffs (April, 2008)
Director (Professor)    Shigeki ARII
Assistant Director (Associate Professor)    Michiko KAJIWARA

2. Purpose of Education
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. Research Subjects
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

4. Clinical Services (The result of 2008)
1) The amount of blood products used
   Red cell component products    11,960 Units    (6,115 bags)
   Platelet concentration    23,625 Units    (1,957 bags)
   Fresh frozen plasma    8,960 Units    (2,967 bags)

2) Autologous blood collection and transfusion
   Autologous blood collection    527 cases    (672 times, 1,300 Units)
   Autologous blood transfusion    479 cases    (1,125 Units)

3) The number of clinical tests of transfusion
   ABO blood typing    7,498
   Rh blood typing    7,498
   Anti red blood cell antibody test    3,267
   Cross match    9,504

4) Hematopoietic stem cell harvest
   Autologous peripheral blood stem cell harvest    13 cases    22 times
   Allogenic peripheral blood stem cell harvest    2 cases    3 times
   Autologous peripheral mononuclear cell harvest    1 case    1 time
   Allogenic bone marrow harvest    12 cases    12 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    10 cases    10 times
   Allogenic peripheral blood stem cell transplantation    2 cases    2 times
   Autologous peripheral mononuclear cell transplantation    1 case    1 time
   Allogenic bone marrow transplantation    6 cases    6 times
   Allogenic umbilical cord blood transplantation    5 cases    5 times
Department of Blood Purification

Professor Sei SASAKI
Associate Professor Tatemitsu RAI
Assistant Professor Akihito OHTA
Hospital Staff Rie OKUTSU Wataru AKITA

(1) Education
The Department of Blood Purification has been engaged in such educational activities as follows.
1) Clinical clerkship of 5th and 6th year students of Medical School
2) Clinical lectures of 4th year students of Medical School
3) Lectures of postgraduate master course students of Medical School
4) Clinical lectures of 2nd year students of School of Health Sciences
5) Hospital training of postgraduate master course students of Medical School (29 students)
6) Hospital training of dialysis therapy (8 trainees)
7) Hospital training of clinical engineering technologists (6 trainees)

(2) Research
The Department of Blood Purification has been engaged in such research activities as follows.
1) Pathophysiology and treatment of chronic renal failure
2) Pathophysiology and treatment of acute renal failure
3) Regenerative medicine of the kidney
4) New techniques in blood purification

(3) Clinical Services
The achievements of clinical services of The Department of Blood Purification in 2008 are as follows.
1) Hemodialysis (HD)
   Number of newly started HD patients 49
   Number of maintenance HD patients 236
   Total number of HD sessions 4031
2) Plasma exchange (PE)
   Number of PE patients 12
   Total number of PE sessions 50
3) Peritoneal dialysis (PD)
   Number of newly started PD patients 3
   Number of PD patients 19
4) Blood absorption
   Number of patients 3
   Number of sessions 29
5) Postoperative acute renal failure
   Number of patients 12
6) Multiple organ failure
   Number of patients 5
7) Number of clinical departments involved in blood purification 26

(4) Publications
Original Articles


**Review Articles**


Hyperbaric Medical Center

1. Staffs (April, 2008)
Center Chief and Junior Associate Professor
Kazuyoshi YAGISHITA
Associate Professor Nobuo YAMAMI
Tokunin Assistant Professor Seiichiro TOGAWA

2. Purpose of Education
Hyperbaric oxygen therapy (HBO), which can dissolve oxygen in serum in population to atomic pressure and transport oxygen to ischemic tissue, is an established therapy for treatment of several conditions, including decompression illness, carbon monoxide poisoning, acute arterial disturbance, and peripheral ischemic disease. The mechanism of HBO can be described as hyperoxygenation in ischemic soft tissues, reduction of edema, stimulation of fibroblast proliferation and differentiation, increased collagen formation and cross-linking, angiogenesis, and improved preservation of energy metabolism.

This curious treatment has clinically many kinds of efficacy, however, the mechanism of the effect has not been fully understood, and many researchers in the world still attempt to reveal the mechanism of the effect of HBO.

This HBO can stimulate the interest of medical students, basic researchers, and clinical doctors, and this hyperbaric medical center can provide opportunities to study hyperbaric oxygen therapy field.

3. Research Subjects
1) Diving medicine
2) Treatment of soft tissue injury related with sports activities
3) Hyperbaric oxygen therapy
4) Oxidative stress

4. Clinical Services
Hyperbaric Medical Center in Tokyo Medical and Dental University hospital is the center institute of hyperbaric oxygen therapy and hyperbaric oxygen research in Japan, and one of the largest hyperbaric oxygen chamber in the world is set up in this Hyperbaric Medical Center, which can contain the maximum number of 16 persons.

As described above, HBO is applied for several conditions, including decompression illness, carbon monoxide poisoning, acute arterial disturbance, and peripheral ischemic disease. In 2007, 7970 times hyperbaric oxygen therapy (HBO) in 958 patients were performed in our university hospital, which is the most patients number in one institute in a year in Japan. In addition, for the purpose of rapid recovery, we now perform HBO aggressively for soft tissue injury related with sports activities including compartment syndrome, ankle sprain, knee ligament injury
Center for Cell Therapy

Director Tomohiro Morio (Associate Professor, Department of Pediatrics and Developmental Biology)
Vise Director Michiko Kajiwara (Blood Transfusion Department)
Staff
Management Representative, Quality Control Manager Michiko Kajiwara
Manufacturing Control Manager Norio Shimizu (Associate Professor, Department of Virology, Medical Research Institute)
Technician Yoshiko Baba (Blood Transfusion Department)
Assistant Atsushi Oyama, Shizuko Minegishi
Collaborators Nakaba Ochiai, Miki Mizukami
Office Akiko Hoshikawa, Ayako Tsuji

(1) Education
Our center was ISO9001:2000-certified (JQA-QMA11047: Scope of Registration: Cell Processing for Activated T-cells) for the first time in Japan as a cell processing center involved in culture of human cells for clinical application. All the procedures are indicated in the manual and standard operation procedure (SOP); and all the processes are documented and stored securely for a future review. The workers in the center are required to receive the in-house training; and the individual is allowed to carry out the particular procedures after passing the examination. We also have an on-the-job training for the internal auditing once a year. We have successfully renewed ISO9001 approval after intensive investigation on February 2009. We are able to offer a training for those who wish to process cells at our center, and to give an advice and an appropriate training for constructing SOP in various fields of regeneration medicine.

(2) Research
1) Quality control of clinical grade products for cell therapy and for regeneration medicine
We are committed to the development of the system (1) to detect multiple microbes with high sensitivity and low cost, (2) to easily monitor DNA damage during cell processing (3) to monitor long-term adverse effect with using humanized NOG-SCID, and (4) to set criteria for standard cells suitable for clinical use. This research work is supported by grant-in-aid by Ministry of Health, Labour, and Welfare, (MHLW) and is conducted by Dr. Morio, Director of Center for Cell Therapy, as a research leader. Dr. Shimizu is a member of another project supported by MHLW, and conducts research work to evaluate quality of cell therapy products.

2) Development of the sensitive & inexpensive method to detect multiple microbes in a short period
With tremendous support from Department of Virology, we have constructed a novel PCR-based system to detect 11 different viruses, HSV1, HSV2, VZV, EBV, CMV, HHV6, HHV7, HHV8, BK virus, JC virus, Parvovirus B19, in a rapid, sensitive, and inexpensive way. The system is open to the Tokyo Medical and Dental University (TMDU) Medical Hospital. The viral load can also be measured by real time quantitative PCR method. Additionally, many other microorganisms are now detectable in our system. Those include HIV1, HIV2, HTLV1, HTLV2, HBV, HCV, Norovirus, Pneumocystis jiroveci, and Cryptosporidium parvum. We are determined to further broaden our repertoire of microbes.

Finally, we are planning to carry out multi-center joint research to verify the validity of our system in monitoring of post-hematopoietic stem cell transplant (HSCT) opportunistic infections.

3) Ex-vivo expanded T-cell therapy for post-HSCT opportunistic infection
Our team is selected as a member of the research projects, "Research on advanced technology and safety assurance in the field of cord blood transplantation" and "Research on the development of novel transplantation technique in HSCT" supported by grant-in-aid of MHLW. We will commence a clinical trial for ex-vivo expanded

4) Ex-vivo expanded cord blood T-cell therapy for post-HSCT
The project has been conducted in close collaboration with Lymphotec, Institute of Biomedical Research and Innovation Laboratory, and National Research Institute for Child Health and Development.

5) Development of short tandem repeat-based individual identification system.
We currently employ a short tandem repeat-based individual identification system with 18 different probes.

6) Transplantation of mesenchymal stem cells derived from synovial membrane for cartilage bone defect.
The team led by Dr. Ichiro Sekiya and Takeshi Muneta at Section of Orthopedic Surgery has developed an innovative technique to expand chondrocytes from autologous synovial membrane. The team has been working on the mechanism of chondrogenesis as well as clinical application of local administration of mesencymal stem cells.

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Center for Cell Therapy at TMDU is equipped with four independent cell processing rooms (CPRs) and one examination room for quality control of the cell products. Most of the particles are filtered through a HEPA filter, and thus the center is kept in clean condition. The clean level of our examination room is class 100,000 and that of CRPs is class 10,000. One of the CPRs for handling potentially harmful micro-organisms is kept at -50Pa and thus is in P3-compatible level. Other three CPRs are kept at +10Pa to eliminate all the microbes from the room. The workers in CPRs are required to wear dust-free garments, mask, and gloves.

The cell processing is carried out according to SOP, and all the products in key processes are checked for their sterility and quality. We are expecting to have more projects from different fields to boost regenerative medicine at our university.

The ongoing projects include cartilage bone regeneration (Section of Orthopedic Surgery), vascular regeneration (Geriatric Medicine), post-HSCT expanded CD4-T cell therapy (Department of Pediatrics, Department of Hematology). Additionally, manipulation of hematopoietic stem cells has been carried out at CPR by staffs of Blood Transfusion Department.

### Our achievement in Year 2008

1) Ex-vivo expanded T-cell therapy 93 cases
2) Examination for multiple viruses with our innovative & sensitive PCR system 993 cases
3) Harvest of peripheral blood stem cells 25 cases
4) Vascular regeneration with HSC 1 case
5) Cartilage bone regeneration 3 case
6) Bone regeneration SOP under construction
Clean Room, University Hospital, Faculty of Dentistry

1. Staffs (April, 2008)

Associate Professor       Mitsuhiro SUNAKAWA
Assistant Professor       Hiroyuki MATSUMOTO

2. Purpose of Education

Main objective of the education by the clean room staff is to educate the appropriate nosocomial infection control methods to all the dental practitioners, that is, dentists, co-dental staffs, post-graduate students and under-graduate students, in the University Hospital, Faculty of Dentistry, Tokyo Medical and Dental University.

3. Research Subjects

1) Development of disposable materials for dental clinic use
2) Clinical investment of the oral lesion of the patients with HIV
3) Survey of the consciousness of dentists and dental students on prevention and control of nosocomial infection

4. Clinical Services

Clean room is prepared to provide comprehensive dental care for immuno-compromised hosts and patients with infectious pathogens in a highly infection-controlled environment.

5. Publications

1) Sunakawa, M., Kaneko, T., Kaneko, M., Suda, H.: p38MAPK and GFAP are up-regulated by MO tooth pulp stimulation. Abstracts of The 86th General Session and Exhibition of the IADR, #3511, 2008 (CD-Rom)
Bioethics Research Center

1. Staffs and Students (April, 2008)

Director Shuki MIZUTANI
Tokunin Professor Masayuki YOSHIDA
Tokunin Assistant Professor Yuka OZASA, Hideto ISHII,
Masumi AI
Research Associate Minori KOKADO, Mizuko OSAKA,
Ryuko ONISHI, Mitsunoei NOMURA,
Daisuke MORI
Post-Graduate Fellow Mariko TANI
Research Collaboration Akio KAWAKAMI (Dept. Vascular Medicine)

2. Purpose of Education

Bioethics Research Center (BERC) 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. We also have a course in Graduate School of Biomedical Science. 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 and the National Institute of Environment.

3. Research Subjects

BERC actively conduct biomedical basic research described below:

1) Signaling mechanisms of vascular endothelium
2) A role of triglyceride-rich lipoprotein in atherosclerosis
3) A role of lipid absorption in intestine and subsequent metabolic pathways
4) Annexin II, a novel fibrinolytic molecule, and its clinical application
5) Molecular Imaging of the vascular injury and inflammation

4. Clinical Services

BERC serves as an out patient clinics at the University Hospital in the field of Genetic Medicine. Our Genetic Medicine department is approved by the Japanese Medical Genetics Society for the Genetics Board.

5. Publications

Original Article


**Review Article**

Oral and Maxillofacial Biology

1. Staff.
   Junior Associate Professor  Yujiro Sakamoto

2. Purpose of Education.
   Oral and maxillofacial biology 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 muscles, nerves, and arteries associated with the mouth and teeth. Students also receive clinical training in oral cleaning programs. In addition to it, students learn the rudiments of English for oral health care science.

Subjects and contents.
- Structure and function of human body I and II: anatomy, histology, physiology, embryology, oral anatomy, oral histology, oral physiology.
- Mechanism and defense against infection: pathology, immunology, microbiology, oral pathology.
- Basic practice of oral health care science: the practices of the basic sciences.
- English for oral health care science I and II: reading, writing.
- Oral health care clinical training: the practice in the dental hospital (oral cleaning programs).
- Graduation thesis.

3. Research Subjects
   1) Gross anatomical study of head and neck.
   2) Light and electron microscopy on the formation of bone and teeth.

4. Clinical Service
   Oral health care clinic specializes in high quality oral cleaning programs in collaboration with dental hygienists.
1. Staffs and Students (April, 2008)
Professor Kumiko Sugimoto
Junior Associate Professor Emiko Tanaka
Research Student Sato Matsukawa
Research Student Rei Muroga

2. Purpose of Education
Fundamental oral health care science is a section of oral health care sciences which deals with the basic oral health sciences to perform evidence-based oral health care and to support people to attain healthy and happy living. Main objective of fundamental oral health care science in the undergraduate course is to provide students opportunity to study the structure and function of the human body as well as stomatognathic region, pharmacology, laboratory practice of physiology and research process. Students are also taught on subjects of social welfare, such as principles of social welfare, theory of welfare of the disabled, exercises of social assistance skills, and supervision of field practice of social assistance skills, in order to acquire the knowledge and skills needed to social workers.

3. Research Subjects
1) Change in taste sensitivity with aging
2) Functional Roles of molecules expressed in taste buds
3) Challenging education in oral health care sciences
4) Independent living of the disabled and resource of living
5) Living of the patients with amyotrophic lateral sclerosis (ALS) and their families
Oral Health Care Education

1. Staffs and Students (April, 2008)
   Professor Kayo TERAOKA

2. Purpose of Education
   Oral health care education is the special field of study which deals with establishment of theoretic and skill for oral health promotion to contribute to the development of the national health. Educational objects of oral health care education in the graduate course is to foster human resources who will be able to implement health promotion program in collaboration with other career or residents in many fields.

3. Research Subjects
   1) Oral health promotion program
   2) Oral health and long-term preventive care for the elderly
   3) Oral care management system for hospitalized person
   4) Oral health administration system in local communities
Preventive Oral Health Care Science

1. Staffs and Students (2008)
Professor Astuhiro KINOSHITA
Junior Associate Professor Keiko KONDO
Assistant Professor on Special Assignment Akiko HORIE
Secretary Masayo SUNAGA

2. Purpose of Education
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.

3. Research Subjects
1) Development of education system for the patients to prevent oral diseases, and for the dental hygienist students.
In our university, we execute a project, Establishment of a Computer Assisted Education System on Clinical Simulation for Medical and Dental Practice Training, which was adopted as a project in Support Program for Distinctive University Education in 2005, and develop computer simulation materials on clinical education by utilizing a plenty of clinical digital contents of our Medical and Dental hospitals. In this study, we develop computer simulation materials for patients and dental hygienist students to learn preventive oral health care sciences, utilize them to our students, and evaluate and analyze their educational effect. We will illustrate whether it is possible or not to apply this self-learning system using computer assisted simulation as a new teaching method in addition to conventional lectures and practices in the oral health care clinical education.

On dental hygienist education, to learn expertise, it is important to take process to pile up the basic skills. Our study is aiming to develop a new assessment program which ensures the acquisition of dental hygienist skills with utilizing student's self assessment in each step of learning and instructor's assessment and feedback. We develop a computer assisted education system which helps students to recognize the goal and assess their own skills in each step of practice.

3) Development of new dental model on technical education for dental hygienists
Practices using dental models are very important on technical education for dental hygienists. We develop new mannequin dental models which will bring more educational effects in dental hygienist education.

4. Clinical Services
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.

5. Publications
Original Article

Abstract
Oral Health Care Promotion

Comparison with Electrosurgery. 11th Congress of World Federation for Laser Dentistry, Hong Kong, China, July 28-30 (July 30, Oral), 2008.
1. Staff
Professor Masaaki ISHIKAWA

2. Purpose of Education
Pediatric oral health care science is a branch of oral health care sciences which deals with children’s total oral health. Main objects of pediatric oral health care science in the undergraduate course is to provide students who are going to dental hygienists knowledge of growth and development in teeth, dentition, occlusion, craniofacial morphology, and oral function such as mastication and phonation. Students are also taught skills and manners concerning the practice of oral health care to children and the team approach in dental treatment for children.

3. Research Subjects
1) Morphological and functional factors to acquire normal masticatory organ
2) Development of the effective training method for children with retarded oral function
3) Current condition of eating disorders in small children
4) Oral health care for disabled children
Geriatric Oral Health Care Science

1. Staffs (April, 2008)
Professor Kazuhiro SHIMOYAMA, DDS, PhD
Junior Associate Professor Naomi YOSHIDA, RDH, B.Sc., Mph, PhD.

2. Purpose of Education
Geriatric Oral Health Care Science is an academic discipline of oral health care science, which contributes maintenance and improvement of health and quality of life for elderly people through the preservation of oral health. It is an interdisciplinary field based on Oral Health Care Science, which needs to cooperate with wide-ranging fields such as healthcare, medical care and welfare. Our education goal for undergraduate students is to be acquired the fundamental knowledge and skill of Geriatric Oral Health Care for preservation and improvement of health for elderly people. They will be cultivated the conducive ability of maintenance and improvement of health and self-support for elderly through lectures and preclinical/clinical practice.

3. Research subjects
1) Oral care for elderly people
2) Improvement of oral hygiene for elderly people who require nursing care
3) Effects of geriatric oral health care science education on students
4) Development of teaching materials and programs for improvement of dental hygiene education

4. Clinical Service
We ensure better health through providing services of oral diseases prevention and maintenance such as dental caries, periodontal disease at the Oral Health Care Clinic. We also provide comprehensive dental service for improvement of health at the clinic for Gerodontics.

5. Publication
Community Oral Health Care Science

1. Staffs and Student (April, 2008)
Professor Hidemi YOSHIMASU
Junior Associate Professor Mitsue ONODERA

2. Purpose of Education
Community oral health care science is a branch of oral health care sciences. Students are taught oral health diagnosis, nutritional sciences, diet education, introduction to care nursing, oral and maxillofacial surgery, and oral health care of medically compromised patient.

3. Research Subjects
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) Oral health care before and after dental implant treatment
5) Morphological and functional research of patients with cleft lip and palate
6) Research for safety in supplements in oral functions
7) Basic research for pathophysiological roles of gap junction

4. Clinical Services
1) High quality oral cleaning programs in collaboration with dental hygienists at Oral Health Care Clinic
2) Diagnosis and treatment of patients with oral and maxillofacial diseases in Oral and Maxillofacial Surgery Clinic.

5. Publications