

Research Subjects, Graduate School of Medical and Dental Sciences,Doctoral Program, Biomedical Sciences and Engineering Track

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BM : Institute of Biomaterials and Bioengineering
MR : Medical Research Institute
MT : Biomedical Laboratory Sciences
DS:M&D Data Science Center

※ 1 : Institute of Physical and Chemical Research (Riken)
※ 2 : National Cancer Center

* Applicants applying to “Hematology and Biophysical Systems Analysis”, “Clinical Bioanalysis and Molecular Biology”, “Joint Graduate School department(RIKEN Molecular and Chemical Somatology, NCC Cancer Science)” and “Interdisciplinary Sciences” need to obtain permission for your application from both prospective supervisor and Department head・Chair professor.

No.	Code	Department	Supervisor	Contact Person	Phone number	e-mail	Research Subject	分野HP（英語）URL	所属
1	5020	Biomedical Devices and Instrumentation *Not recruiting this year	MITSUBAYASHI Kohji	MITSUBAYASHI Kohji	5280-8091	m.bdi@tmd.ac.jp	1. Basic and applied research on "BioMedical Sensing" (integration with various engineering technologies) 2. Wearable devices and artificial organs with MEMS-tech and biocompatible polymers 3. Bio-fluorometric sensing of disease-based breath chemicals 4. Real-time imaging of transcutaneous volatiles for metabolic evaluation 5. Novel wearable biosensors (i.e. Head-set type gas-sensing system for transcutaneous blood volatiles)		BM
2	5030	Biomedical Informatics	NAKAJIMA Yoshikazu	NAKAJIMA Yoshikazu	5280-8173	nakajima.bmi@tmd.ac.jp	1. Medical artificial intelligence (AI) for diagnosis, treatment planning, and bioinformation analysis using 2. Biomedial imaging 3. Bimedical informatics, which includes information systems, numerical modeling and simulation for biomedicine 4. Research on computer navigation, devices and robots to support surgeries 5. Research on digital transformation (DX) and artificial intelligence (AI) for hospitals		BM
3	3280	Precision Biomedical Engineering	IKEUCHI Masashi	IKEUCHI Masashi	5280-8040	ikeuchi.mech@tmd.ac.jp	1. Polymer 3-D Micro/Nano Fabrication Technology 2. Micro-scale Soft Robotics 3. Integrated Microdevice for Mechanobiology Study 4. Medical Microsystem for Assisted Reproductive Technology 5. Automatic Micro-fluidic Tissue Culture System 6. DNA-Origami Technology 7. Molecular Robotics	https://sites.google.com/view/ikeuchi-lab	BM
4	5050	Material-based Medical Engineering *Not recruiting this year	KISHIDA Akio *Scheduled to retire in March 2025	KISHIDA Akio	5280-8028	kishida.mbme@tmd.ac.jp	1. Research on the materials and the engineering for tissue engineering and regenerative medicine 2. Research on the processing and high functionality of biological materials 3. Research on the novel method for evaluating inflammatory responses on medical materials in vitro 4. Research on the control technology of cellular functions by extracellular matrix-bounded nanovesicles 5. Research on the high selective cell capture devices for immunomodulation		BM
5	5060	Organic and Medicinal Chemistry *Not recruiting this year	KAGECHIKA Hiroyuki	KAGECHIKA Hiroyuki					BM
6	5070	Chemical Bioscience	HOSOYA Takamitsu	HOSOYA Takamitsu	5280-8117	thosoya.cb@tmd.ac.jp	1. Drug seed development based on new synthetic methodologies 2. Development of new methods to connect molecules based on strained molecules 3. Probe synthesis for target protein identification of bioactive compounds 4. Probe design and synthesis for in vivo molecular imaging		BM
7	5080	Medicinal Chemistry	TAMAMURA Hirokazu	TAMAMURA Hirokazu	5280-8036	tamamura.mr@tmd.ac.jp	1. Development of bifunctional molecules using organic synthesis. 2. Development of peptidomimetics and drug discovery templates. 3. Development of antiviral agents and anti-cancer agents. 4. Development of bioprobes and chemical biology.	http://www.tmd.ac.jp/it-mde/www/en/biomolecular/index1.html	BM
8	5090	Soft Matter and Biomedical Engineering	NARUTAKI Ayae	NARUTAKI Ayae	5280-8006	narutaki.ayae@tmd.ac.jp	1. Development of artificial proteins and their application to biomaterials 2. One-, two-, and three-dimensional self-assembly of inorganic nanoparticles in liquid phase 3. Bio-inspired inorganic synthesis 4. Understanding and controlling the relationship between nonlinear mechanical properties of extracellular matrices and biological phenomena		BM
9	5110	Organic Biomaterials	MATSUMOTO Akira	MATSUMOTO Akira	5280-8020	matsumoto.bsr@tmd.ac.jp	1. "On-skin-pancreas" technology for precision medicine in diabetes 2. Boronic acids-based molecular-recognition chemistry as a platform for diagnostic and therapeutic applications 3. Stimulus-cleavable chemistry and its application to biomaterials science and engineering 4. Bioactive nanomaterials using self-assembly to support biological structure and function	http://www.tmd.ac.jp/bsr/index.html	BM
10	5120	Diagnostic and Therapeutic Systems Engineering	KAJI Hirokazu	KAJI Hirokazu	5280-8163	kaji.bmc@tmd.ac.jp	1. Biofabrication technology 2. Implantable drug delivery devices 3. Minimally invasive cell delivery system 4. Micropysiological systems	https://www.tmd.ac.jp/bmc/	BM
11	5360	Ceramic Biomaterials	YOKOI Taishi	YOKOI Taishi	5280-8014	yokoi.taishi.bcr@tmd.ac.jp	1. Development of layered calcium phosphate based-materials for hard tissue regeneration 2. Development of ultra-tough artificial bone 3. Biomedical application of inorganic materials responding to biomolecules 4. Design of ceramic materials compatible with therapy and diagnosis 5. Development of ceramic micro/nano-particles for intra-arterial therapy of deep-seated cancer		BM
12	5370	Advanced Bio-molecular Design *Not recruiting this year	KAGECHIKA Hiroyuki (currently assigned)				1. Development of mRNA therapeutics 2. Technology on cell fate determination 3. Molecular biology associated with applications of mRNA therapeutics 4. Molecular design for advanced nucleic acid medicine		BM
13	5130	Molecular Cell Biology *Not recruiting this year	SHIBUYA Hiroshi	SHIBUYA Hiroshi	5803-4901	shibuya.mcb@mri.tmd.ac.jp	1. Molecular mechanism in cellular signaling of growth and differential factors 2. Molecular mechanism in the onset and progress of diseases 3. Molecular mechanism in the early deveopment	https://www.tmd.ac.jp/mcb/	MR
14	5140	Developmental and Regenerative Biology *Not recruiting this year	NISHINA Hiroshi	NISHINA Hiroshi	5803-4659	nishina.dbio@mri.tmd.ac.jp	1. Study on signaling pathways that regulate cell surival and death 2. Study on signaling pathways that regulate embryonic stem cell proliferation and differentiation 3. Study on liver formation and regeneration using mice and fish 4. Study on molecular mechanisms regulating circadain clock		MR
15	5160	Advanced Nanomedical Engineering	UCHIDA Satoshi	UCHIDA Satoshi	5803-4954	uchida.anme@tmd.ac.jp	1.Development of nano DDS for mRNA, nucleic acids, and gene therapeutics 2.Molecular designing and engineering of mRNA for the delivery and therapeutic use 3.Development of mRNA vaccines for infectious disease prevention and cancer therapy 4.Disease treatment using mRNA therapeutics		MR
16	5170	Structural Biology	ITO Nobutoshi	ITO Nobutoshi	5803-4594	ito.str@tmd.ac.jp	1. Structural biology by X-ray crystallography and cryo-electron microscopy 2. Structural and kinetic analyses of protein-protein interactions 3. Molecular recognition of small-molecule ligands (drugs) by proteins 4. Computational biology of biological macromolecules using structural information		MR

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17	5180	Biomolecular Pathogenesis	MATSUDA Noriyuki	MATSUDA Noriyuki	5803-5294	nr-matsuda.biom@tmd.ac.jp	1. Elucidation of molecular function of causative genes for hereditary Parkinson's disease, i.e., PINK1, Parkin, and DJ-1. 1-A. Study on the function of DJ-1 focusing on a novel post-translational modification. 1-B. Study on the function of PINK1 and Parkin during mitophagy (process for selective mitochondrial degradation). 2. Elucidation of the intracellular role of ubiquitin-mediated selective autophagy and mitophagy. 3. Identification of novel factors involved in membrane traffic during selective organelle degradation, and elucidation of their functions.	https://www.tmd.ac.jp/	MR
18	5190	Bio-informational Pharmacology *Not recruiting this year	Under Selection				1. Understanding the molecular mechanisms of the transcriptional and epigenetic regulators for mesodermal cells specification during development 2. Understanding congenital heart-hand syndromes 3. Epigenome and proteome analysis during the heart regeneration 4. Bioinformatics analysis in cardiovascular development 5. Reprogramming/transdifferentiation in development		MR
19	5210	Epigenetic Epidemiology *Not recruiting this year	Under Selection				1. Effects of intrauterine environment on neonate epigenome 2. The molecular mechanisms underpin DOHaD phenomena (animal experiment) 3. Gene-environment interaction in common diseases 4. Integrated personal disease risk assessment system		MR
20	5380	Functional Genome Informatics	NIKAIDO Itoshi	NIKAIDO Itoshi	5803-4057	itoshi.nikaido.fgin@tmd.ac.jp	1. Development of data science technologies for large-scale genome analysis using machine learning and computer science 2. Development of new experimental techniques for large-scale genome science 3. Study of the development of regenerative medicine and drug discovery using large-scale genome analysis		MR
21	5500	Medical Chemistry	SEGAWA Katsumori	SEGAWA Katsumori	5803-4905	segawa.mche@tmd.ac.jp	1.Identification of factors responsible for cellular membrane dynamics. 2.Aberrant membrane dynamics and associated diseases. 3.Identification of factors responsible for cellular homeostasis.		MR
22	5220	RIKEN Molecular and Chemical Somatology	TANIUCHI Ichiro TANAKA Motomasa WATANABE Rikiya HAGIHARA Shinya IMAMI Koshi	TANIUCHI Ichiro	045-503-7044	ichiro.taniuchi@riken.jp	1. Regulatory mechanisms for the lymphocyte development (TANIUCHI Ichiro) 2. Molecular basis of psychiatric diseases and neurodegenerative disorders (TANAKA Motomasa) 3. Development of digital detection technology for disease-biomarkers based on single molecule biophysics (WATANABE Rikiya) 4. Regulation of physiological function of plants with synthetic molecules (HAGIHARA Shinya) 5. Proteomics in gene expression control and diseases (IMAMI Koshi)		※1 【注1：連携大学院分野】
23	5230	NCC Cancer Science	SUZUKI Hiromichi YOSHIMI Akihide YOSHIDA Kenichi TAKEDA Haruna OBATA Yuuki YOSHIOKA Ken-ichi	SUZUKI Hiromichi	3542-2511 (ext. 3838)	hiromics@ncc.go.jp	1. Carcinogenesis and molecular mechanism 2. Functions of cancer-associated genes and their alterations 3. Genomic, epigenomic and proteomic analysis of cancer and personalized medicine 4. Tumor microenvironment/cancer stem cells/non-coding RNA/signaling pathway 5. Molecular target/drug delivery/diagnosis and therapy		※2 【注1：連携大学院分野】
24	5240	Cellular and Molecular Medicine	SASAKI Junko	SASAKI Junko	5803-5823	jsjunko.pip@mri.tmd.ac.jp	1.Molecular mechanism of sex reversal induced by lipid metabolism 2.Malignant tumor and lipid metabolism 3.Biological significance of phospholipid acyl-chain composition		MR
25	5390	Interdisciplinary Sciences	NAKABAYASHI Jun YAGISHITA Kazuyoshi NARA Masayuki TOKUNAGA Shin-ichi	NAKABAYASHI Jun	047-300-7120	nakab.jas@tmd.ac.jp	1. Histopathological image analysis of hepatocellular carcinoma by artificial intelligence 2. The effects of hyperbaric oxygen environment on healing acceleration in soft tissue injuries 3. Spectroscopic analysis for molecules of life 4. Problems of graph theory as the basis of network structure in life science		
26	5400	Data Science Algorithm Design and Analysis	BANNAI Hideo	BANNAI Hideo	5280-8623	hdbn.dsc@tmd.ac.jp	1. Algorithms and data structures for matching, searching, and discovering patterns 2. Algorithms and data structures for compression and compressed data processing 3. Combinatorics on strings		DS
27	5410	AI Technology Development	ZHU Xin	ZHU Xin	5280-8627	zhu.xin@tmd.ac.jp	1. Research and development of AI technologies for the analysis of medical images, signals, and information 2. Research and development of AIoT medical devices 3. Theory, methodology, and application of statistical modeling 4. Explainable AI technologies and medical informatics for systematic understanding, diagnosis, therapy, and education of diseases 5. Analysis of omics data for healthcare		DS
28	5150	Homeostatic Medicine	TOYOSHIMA Fumiko	TOYOSHIMA Fumiko	5803-4950	toyoshima.hm@tmd.ac.jp	1. Study on physiological organ remodeling and plasticity on life stages 2. Maternal organ remodeling during pregnancy and maternal-fetal crosstalk 3. Development of regenerative medicine based on physiological organ remodeling		MR
29	5430	Computational Drug Discovery and Design	ISHITANI Ryuichiro	ISHITANI Ryuichiro	5803-4175	r.ishitani@tmd.ac.jp	1. Elucidation of the dynamics of biological macromolecules by molecular dynamics simulation 2. Quantum chemical simulations to elucidate the reaction mechanism of enzymes 3. Application of deep learning to structural biology 4. Application of deep learning to structure-based small- and medium-molecule drug discovery		MR
30	5420	Molecular and Mechanistic Immunology	KATO Kazuki	KATO Kazuki	080-7218-6743	kato.kazuki@tmd.ac.jp	Our current research focus on 1. mechanism of anti-viral immune response 2. mechanism of autoimmune disease caused by self-attacking immune response 3. development of drugs targeting autoimmune and cancer disease 4. development of novel cell manipulation technology by using the CRISPR-Cas system, adaptive immune systems in prokaryotes	https://kato-lab.org	IR
31	5270	Anatomical and Pathological Sciences	HOSHI Osamu	HOSHI Osamu	5803-5361	o-hoshi.aps@tmd.ac.jp	1. Application of atomic force microscopy to biological fields. 2. Analysis of high-order structure of human chromosomes. 3. Analysis of dynamics of growth cones of neuron. 4. Molecular pathological study of biliary tract cancer and development of a novel therapy 5. Creation of digital content using cytological images, AI imaging diagnosis 6. Development of pathological diagnosis and pathological technology in developing countries		MT
32	5300	Hematology and Biophysical Systems Analysis	ITO Minami *Scheduled to retire in March 2025 Associate Professor: NISHIO Miwako *Prof Ito: Not recruiting this year	NISHIO Miwako	5803-5882	mnishio.lmg@tmd.ac.jp	1. Laboratory molecular and genetic analyses on hematologic neoplasms 2. Epstein-Barr virus positive T- or NK-cell neoplasms: Clarification of the onset mechanisms and development of the new treatment strategies 3. Development of brown adipocytes detection method using human ES/iPS cells 4. Elucidation of the activation mechanism in brown adipocytes		MT
33	5280	Clinical Information Applied Sciences *Not recruiting this year	SUMI Yuki	AKAZA Miho	5803-5377	m-akaza.nuro@tmd.ac.jp	1. Pathogenic mechanisms of bronchial asthma, COPD, interstitial pneumonia 2. Gene therapy and immunotherapy for lung diseases 3. Pathogenesis of neuropsychiatric disease using non-invasive brain function tests and image analyses 4. Investigation of epilepsy using EEG 5. Evaluation of brain function using the event-related potential analysis		MT

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34	5290	Clinical and Diagnostic Laboratory Science	KAKINUMA Sei	KAKINUMA Sei	5803-5365	skakinuma.gast@tmd.ac.jp	1. Development of novel disease models using human IPS cell-derived organoids to elucidate the pathophysiology of hepatobiliary diseases 2. Molecular mechanisms regulating cell-to-cell interaction regulating inflammation, fibrosis, and regeneration in liver and intestine. 3. Molecular mechanisms regulating homeostasis of stem/progenitor cells in hepatobiliary and intestinal diseases 4. Elucidation of molecular mechanisms regulating the pathogenesis of inflammatory bowel disease and search for biomarkers in the IBDs. 5. Analysis on cell communication and signaling of heart failure	https://www.tmd.ac.jp/english/dept/life_sci ence_and technology/cp/	MT
35	5310	Clinical Bioanalysis and Molecular Biology	OHKAWA Ryunosuke Associate Professor: SUZUKI Nobuharu	OHKAWA Ryunosuke	5803-5374	ohkawa.alc@tmd.ac.jp	1. Development of a new biomarker to estimate residual risk for cardiovascular disease 2. Mechanism of HDL diversification and its effect on the character and function 3. Molecular mechanism of red blood cell-related lipids metabolism 4. Development of new models of neurological and mental disorders using genetically engineered mice 5. Study on molecular mechanisms of myelination in the central nervous system 6. Functional and structural analysis of cell adhesion molecules and extracellular matrix molecules		MT
36	5330	Molecular Microbiology and Immunology	SAITO Ryoichi	SAITO Ryoichi	5803-5368	r-saito.mi@tmd.ac.jp	1. Evolutionary dynamics of multidrug-resistant bacteria 2. Environmental microbiome dynamics and interactions for antimicrobial resistance transmission 3. Bacterial adaptations in different environments 4. Long-term immunity of virus-specific memory T cells and immunotherapy 5. Hematopoietic stem cell mobilization and transplantation 6. Multidimensional analysis of viral pathogen infection mechanisms		MT
37	1130	Lifetime Oral Health Care Science	TAKEUCHI Yasuo	TAKEUCHI Yasuo	5803-4970	takeuchi.peri@tmd.ac.jp	1. Analysis of the oral microbiome for risk assessment and development of treatment strategies for periodontal disease 2. Application of visible light for infection control 3. Influence of the oral microbiome in systemic health 4. Therapeutic effects of essential oils and functional water on the oral bacteria		OH
38	1140	Oral Care for Systemic Health Support	KABASAWA Yuji	KABASAWA Yuji	5803-4647	kabasawa.ocsh@tmd.ac.jp	1. Research on oral management and multidisciplinary collaboration during cancer treatment and perioperative period. 2. Research on the relationship between systemic disease and oral health. 3. Development of the new methods for oral care, oral mucositis prevention and oral mucosal disease treatment. 4. Reserch on social inequalities in oral health.		OH
39	1150	Preventive Oral Health Care Science	KINO Shiho	KINO Shiho	5803-4096	shiho.kino.ohp@tmd.ac.jp	1. Epidemiological research on oral disease prevention and oral health promotion 2. Research on health inequalities and social determinants of health 3. Research on oral health and health care systems 4. Research on dental hygiene education		OH
40	1160	Oral Health Sciences for Community Welfare	MATSUO Koichiro	MATSUO Koichiro	5803-4545	matsuo.ohcw@tmd.ac.jp	1. Invention of oral frail preventive program for community dwelling older adults 2. Invention of monitoring system for eating behavior in dependent older adults 3. Innovative food technology systems for independent senior living 4. Establishment of oral management system during stroke recovery 5. Invention of perioperative oral management system for cancer patients		OH
41	1170	Oral Health Care Education *Not recruiting this year	YOSHIDA Naomi	YOSHIDA Naomi	5803-4646	yoshida.ohce@tmd.ac.jp	1. Research and development of oral health education methods 2. Research and development of assessment tool for oral health 3. Development and evaluation of dental hygiene education system 4. Role of dental hygienists in team approaches to care of patients		OH
42	1620	Basic Oral Health Engineering *Not recruiting this year	AOKI Kazuhiro	AOKI Kazuhiro	5803-4641	kazuhiro_aoki.bhoe@tmd.ac.jp	1. Development of novel bone anabolic reagents with suitable scaffold by interdisciplinary research among medical, dental, and engineering toward clinical applications. 2. Relationship between oral bacteria and systemic diseases - Interdisciplinary research toward improvement of lifestyle-related diseases - 3. Study on the quality of life related to functional restoration by dental prostheses 4. Research on the oral and maxillofacial prosthetic rehabilitation 5. Research on the role of dental technicians in team approaches		OE
43	1630	Digital Dentistry	TAKAICHI Atsushi	TSUCHIDA Yumi	5803-5455	yumi.bmoe@tmd.ac.jp	1.The applications of the digital density for the dental practice 2.The development of methods for fully digital removable dentures 3. Development of medical device software applying machine learning 4.The methods for the digitalized dental educations	https://www.tmd.ac.jp/ddd/english/	OE
44	1640	Oral Biomedical Engineering	IKEDA Masaomi	IKEDA Masaomi	5803-5382	ikeda.csoe@tmd.ac.jp	1. Study on evaluation, improvement and development of CAD/CAM dental technology 2. Revaluation of conventional analog techniques in dental laboratory 3. Application of dental technology by dental technician to various medical fields 4. Improvement of work environment and expansion of job categories for dental technicians 5. Study on international standardization of the dental technology in dental laboratory	https://www.tmd.ac.jp/english/ohe/OPE_55129a0981d7e/	OE