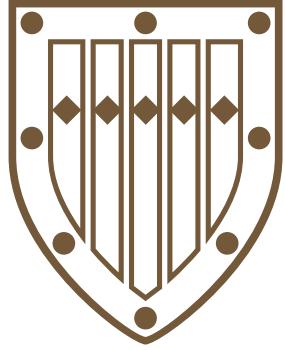
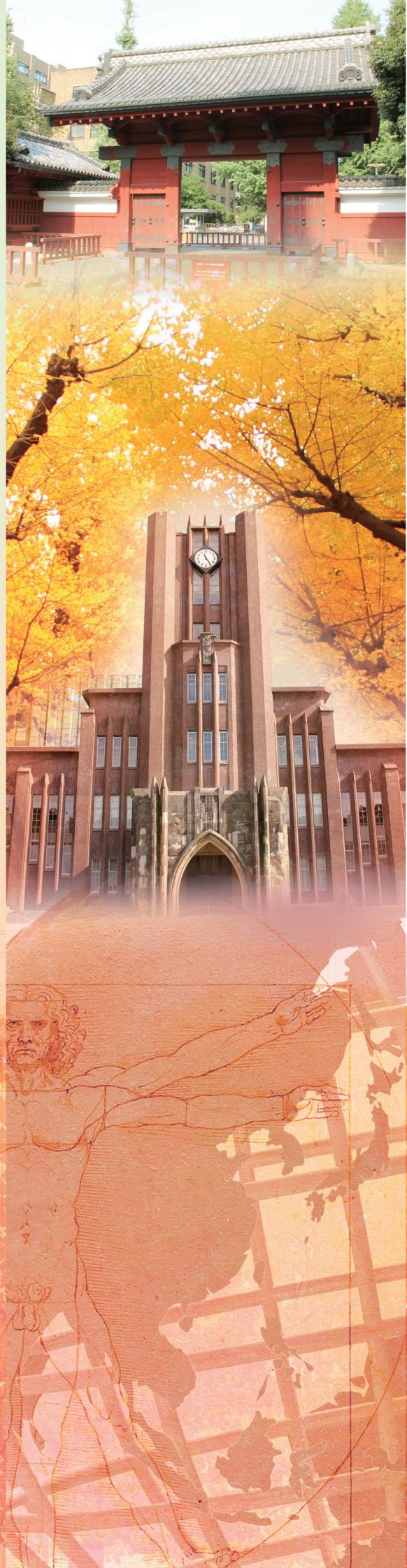


The University of Tokyo  
Faculty of Medicine  
Graduate School of Medicine



PROSPECTUS 2017—2018





# A Message From the Dean of Faculty and Graduate School of Medicine, the University of Tokyo

Faculty of Medicine, the University of Tokyo was established in 1858, and in May of 2008 we celebrated the 150th anniversary of our founding. University Executives, faculty members, staff, and students came together for an impressive birthday ceremony, and a student-designed monument was installed in front of our main building. To mark the occasion, we also established the Museum of Health and Medicine in 2011, and we are building the Clinical Research Center at the hospital area.

With its history and traditions in mind, we must move Faculty of Medicine, the University of Tokyo continuously forward. Each year in our Faculty, some 110 students begin medical school and about 40 are admitted to School of Integrated Health Sciences (School of Health Sciences and Nursing until 2009). Also, through our highly competitive PhD-MD program and the Medical Scientist Training Program that we began in 2008, several outstanding medical students have already taken their first steps on the road to research careers. In 2010, we started the Clinical Research Training Program for clinicians and students who are interested in clinical research. Our graduate school has a wide range of programs of study, and we grant from 150 to 200 doctoral degrees each year. Since its establishment in 2007, our School of Public Health has admitted many exceptional physicians and public health researchers. It is also noteworthy that many students who enter our Master's degree program in the medical sciences after graduating with Bachelor's degrees in fields other than medicine continue their studies in our doctoral programs.

We expect that medicine will be at the center of the rapidly advancing life sciences in the 21st century. Furthermore, as we face the consequences of having an increasing number of elderly people in our population, we know that integrated health sciences, preventive medicine, environmental medicine, and nursing will become increasingly important. In order to introduce Precision Medicine at the University of Tokyo, genome medicine is also becoming important. We have internationally prominent teachers and researchers working in a wide variety of fields, and numerous endowed departments and social cooperation programs that embody productive relations between academia and industry.

Through our Programs for Leading Initiative Graduate Students, we support financially graduate students and collaborative research with other graduate schools. Among our international activities, we teach students mainly from Asia and southeast Asia but also from other regions, and we are forging new ties with universities in Europe and North America.

Thus we are involved in a broad and growing spectrum of activities: investigating the human body in health and disease; promoting cross-disciplinary integration at the cutting edge of medical research and education; improving methods of diagnosis, treatment, and acute and long-term care; strengthening preventive medicine; improving hospital management and medical services delivery; and communicating effectively in the wider social sphere.

In brief, we continue on our missions to provide the best possible medical care to patients in need today and to train top-level research scientists who will lay the foundations of medicine for tomorrow.

  
Kohei Miyazono  
Dean, Faculty and Graduate School of Medicine  
The University of Tokyo



# HISTORY

1858	May	Practitioners, trained in Dutch (European) medicine in Edo (Tokyo), laid out money to establish the Shutojo (vaccination center) in Kanda Mitamagaike.
	Nov.	Shutojo was destroyed in a fire that had spread from Kanda Aioicho. Shutojo continued its operations at other sites such as the residence of Ito Genboku.
1859	Sep.	Shutojo was reconstructed at Shitaya Izumibashi Dohri.
1860	Oct.	Shutojo became an official medical institution of the Shogunate Government.
1861	Oct.	Shutojo was renamed as Seijo Igaku-Sho (Institute of Western Medicine) and offered courses of Western Medicine in the fields of Education, Autopsy, and Vaccination.
1863	Feb.	Seijo Igaku-Sho was renamed as Igaku-Sho (Institute of Medicine).
1868	Jul.	Igaku-Sho, affiliated with the Military Hospital which had been moved from Yokohama to Todo residence in Shitaya, was renamed as Daibyoin (the Great Hospital).
1869	Feb.	The Daibyoin was renamed as Igakko-Ken-Byoin (Medical School and Hospital).
	Dec.	Igakko-Ken-Byoin was renamed as Daigaku Toko (University East Building).
1871	Jul.	The Ministry of Education was established and Daigaku-Toko was renamed as Toko (East Building).
1872	Aug.	A School System was established. Toko was renamed as Daiichi-Daigaku-Ku- Igakko (The First University District Medical School).
1874	May	Daiichi-Daigaku-Ku-Igakko was renamed as Tokyo-Igakko (Tokyo Medical School).
1876	Nov.	Tokyo-Igakko was moved to Hongo.
1877	Apr.	Tokyo Igakko, affiliated with Tokyo-Kaisei School, was renamed as The University of Tokyo. Tokyo Medical School was renamed as The University of Tokyo Faculty of Medicine.
1886	Mar.	The University of Tokyo was renamed as Imperial University, and The University of Tokyo Faculty of Medicine was renamed as the Imperial University Medical College. A Graduate School was established.
1897	Jun.	The Imperial University was renamed as Tokyo Imperial University.
1917	Aug.	Eiraku Hospital, affiliated with the Ministry of Education Medical Practice License Examination, moved to Tokyo Imperial University and was renamed as Koishikawa Hospital affiliated with Tokyo Imperial University Medical College.
1919	Apr.	A faculty system was established renaming Tokyo Imperial University Medical College as the Faculty of Medicine.
1931	Feb.	The first building of the Faculty of Medicine was constructed.
1936	Jan.	The Brain Research Laboratory was built with funds donated by Mr. Hisasaburo Horikoshi.
	Nov.	The second building of the Faculty of Medicine (main building) was constructed.
1947	Oct.	Tokyo Imperial University was renamed as The University of Tokyo.
1950	Apr.	The Institute of Nursing was renamed as The University Nursing School.
1953	Apr.	The School of Health Care and Nursing was founded.
	Jul.	The Graduate School was founded, and the Division of Medical Doctor Biological Science was established. The Brain Research Laboratory became the Brain Research Institute of the Faculty of Medicine.
1956	Apr.	The Midwives School was established.
1958	Apr.	The Division of Pharmaceutical Sciences became an independent faculty.
	May	The University of Tokyo Faculty of Medicine celebrated its centennial anniversary.
1961	Mar.	The Medical Library was built in commemoration of the centenary.
	Apr.	The Institute of Medical Electronics was established.
1965	Apr.	The Research Institute of Logopedics and Pediatrics was established. The School of Health Care and Nursing was reorganized as the School of Health Sciences. The Graduate School of The University of Tokyo was reorganized and the Division of Medical Doctor Biological Science became the Faculty of Medicine. The Health science Course was established in the Medical Science Division.

- 1966 Sep. The third building of the Faculty of Medicine was constructed.
- 1971 Apr. The Laboratory of Animal Experiments was established.
- 1973 Mar. The Animal Center for Biomedical Research was constructed.
- 1983 Jan. An annex of the third building of the Faculty of Medicine was constructed.
- 1985 Sep. The office of International Academic Affairs was established.
- 1987 Apr. Specialized courses were introduced to the Graduate School of Medicine.
- 1992 Apr. The School of Health Sciences became the School of Health Science and Nursing. The School of International Health was established in the Medical Science Division.  
Jul. The Radiation Research Institute was established.
- 1995 Apr. As a result of the shift to the chair system of the Graduate School of Medicine, four divisions, Third Basic Medicine, Social Medicine, Third and Fourth Clinical Medicine, were replaced with Pathology, Immunology and Microbiology, Social Medicine, Reproduction and Development, and Aging Science and Surgery.
- 1996 Apr. As a result of the shift to the chair system of the Graduate School of Medicine, three divisions, First Clinical Medicine, Health Science, and International Health, were replaced with Internal Medicine, Health Science and Nursing, and International Health.
- 1997 Apr. As a result of the shift to the chair system of the Graduate School of Medicine, three divisions, First and Second Basic Medicine, and Second Clinical Medicine, were replaced with Molecular Cell Biology, Functional Biology, Radiology and Biomedical Engineering, and Neuroscience.  
As a result of the above-mentioned reorganization, three institutes, the Institute of Brain Research, the Institute of Medical Electronics, and the Institute of Logopedics and Phoniatrics were made redundant.
- 1999 Apr. The Master course of Medical Science was established in the Graduate School of Medicine. This course accepts graduates of all faculties except those from Schools of Medicine, Dentistry, and Veterinary Medicine.
- 2000 Apr. The International Research Center for Medical Education was established (A shared facility for education and research).
- 2001 Apr. The University Branch Hospital was united with the University Hospital.
- 2002 Mar. Nursing School and Midwives School was closed.  
Experimental Building (First Stage) was constructed.
- 2003 Apr. The Center for Disease Biology and Integrative Medicine was established.  
The Radiation Research Institute and the Laboratory of Animal Experiments were integrated into the Center for Disease Biology and Integrative Medicine.
- 2004 Apr. All the National Universities owned by the Japanese Government became National University Corporations. and the University of Corporation.
- 2005 Mar. Experimental Building (Second Stage) was constructed.
- 2007 Apr. The School of Public Health was established. This school offers programs for Master of Public Health.
- 2008 May. The University of Tokyo Faculty of Medicine and the University of Tokyo Hospital celebrated their 150th anniversary.
- 2010 Apr. The School of Health Science and Nursing became the School of Integrated Health Sciences.
- 2011 Jan. The Museum of Health and Medicine was established.
- 2012 Apr. The Office for Research Ethics Support was established.
- 2013 Apr. The International Research Center for Medical Education became a facility of the Graduate School of Medicine.
- 2013 Oct. The Life Sciences Core Facility was established.
- 2015 Apr. The Office for Clinical Practice and Medical Education was established.
- 2017 Apr. The Global Nursing Research Center was established.

## Graduate School of Medicine

Dean Kohei Miyazono



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### Molecular Cell Biology

<b>Cell Biology and Anatomy</b>	Cell Biology	Professor	Masahide Kikkawa
	Structural Biology	Professor	Yoshimitsu Kanai
	Structural Cell Biology	Associate Professor	Shigeo Okabe
	Cellular Neurobiology	Professor	Noboru Mizushima
<b>Biochemistry and Molecular Biology</b>	Molecular Biology	Professor	Hiroyuki Mano
	Cellular Signaling	Professor	Hiroki Kurihara
	Physiological Chemistry and Metabolism	Professor	
<b>*Collaborative Department</b>	Clinical Genome Informatics / Lipid Science		



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### Functional Biology

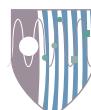
<b>Physiology</b>	Integrative Physiology	Professor	Kenichi Ohki
	Cellular and Molecular Physiology	Professor	Masanori Matsuzaki
	Neurophysiology	Professor	Masanobu Kano
<b>Pharmacology</b>	Cellular and Molecular Pharmacology	Professor	Kenzo Hirose
	Systems Pharmacology	Professor	Hiroki Ueda



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### Pathology, Immunology and Microbiology

<b>Pathology</b>	Pathology and Diagnostic Pathology	Professor	Masashi Fukayama
	Associate Professor	Teppei Morikawa	
	Associate Professor	Tetsuo Ushiku	
	Molecular Pathology	Professor	Kohei Miyazono
<b>Microbiology</b>	Microbiology	Professor	Masanori Hatakeyama
	Infection Control and Prevention	Professor	Kyoji Moriya
<b>Immunology</b>	Immunology	Professor	Hiroshi Takayanagi
	Associate Professor	Takeshi Nitta	
<b>*Collaborative Department</b>	Tumor Pathology / Infection Pathology / Molecular Oncology		



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### Radiology and Biomedical Engineering

<b>Radiology</b>	Diagnostic Radiology	Professor	Osamu Abe
	Associate Professor	Harushi Mori	
	Radiotherapy	Associate Professor	Keiichi Nakagawa
<b>Biomedical Engineering</b>	Nuclear Medicine	Associate Professor	Hidemasa Takao
	System Physiology	Associate Professor	Kimiko Yamamoto
	Chemical Biology and Molecular Imaging	Professor	Yasuteru Urano
	Biosystem Construction and Control	Associate Professor	Yusuke Abe



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### Neuroscience

<b>Basic Neuroscience</b>	Neuropathology	Professor	Takeshi Iwatsubo
	Neurochemistry	Professor	Haruhiko Bito
	Neurobiology	Professor	Kenzo Hirose
<b>Integrative Medical Neuroscience</b>	Developmental Neuroscience		
	Cognitive Neuroscience		
	Systems Medical Neuroscience		
	Child Neuropsychiatry	Associate Professor	Yukiko Kano
<b>Clinical Neuroscience</b>	Neuropsychiatry	Professor	Kiyoto Kasai
	Associate Professor	Chihiro Kakuchi	
	Associate Professor	Seiichiro Jinde	
	Neurology	Associate Professor	Jun Shimizu
	Neurosurgery	Professor	Nobuhito Saito
		Associate Professor	Hirofumi Nakatomi



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## Social Medicine

<b>Occupational, Environmental and Preventive Medicine</b>	Molecular Preventive Medicine	Professor	Kouji Matsushima
	Public Health	Professor Associate Professor	Yasuki Kobayashi Satoshi Toyokawa
<b>Forensic Medicine, and Medical Informatics and Economics</b>	Forensic Medicine	Professor Associate Professor	Hirotaro Iwase Yohsuke Makino
	Biomedical Informatics	Professor	Kazuhiko Ohe
<b>*Collaborative Department</b>	Cancer Health Services Research		



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## Internal Medicine

<b>Medicine I</b>	Cardiovascular Medicine	Professor	Issei Komuro
	Respiratory Medicine	Professor	Takahide Nagase
	Gastroenterology	Professor	Kazuhiko Koike
	Nephrology	Professor	Masaomi Nangaku
	Endocrinology	Professor	Masaomi Nangaku
<b>Medicine II</b>	Nutrition and Metabolism	Professor Associate Professor	Takashi Kadowaki Toshimasa Yamauchi
	Hematology and Oncology	Professor	Mineo Kurokawa
	Allergy and Rheumatology		
	Infectious Diseases	Professor Associate Professor	Kyoji Moriya Syu Okugawa
	Stress Sciences and Psychosomatic Medicine	Associate Professor	Kazuhiro Yoshiuchi
<b>Clinical Laboratory Medicine and Pathology</b>	Clinical Laboratory Medicine	Professor Associate Professor	Yutaka Yatomi Hitoshi Ikeda
	Transfusion Medicine	Professor	Hitoshi Okazaki
	Molecular Diabetology		
<b>*Collaborative Department</b>			



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## Reproductive, Developmental and Aging Sciences

<b>Obstetrics and Gynecology</b>	Reproductive Endocrinology	Professor	Tomoyuki Fujii
	Associate Professor	Takeshi Nagamatsu	
	Gynecological Oncology	Associate Professor	Katsutoshi Oda
	Perinatal Medicine	Associate Professor	Kaori Koga
<b>Pediatric Sciences</b>	Molecular and Cellular Reproductive Medicine	Professor Associate Professor	Yutaka Osuga Osamu Hiraike
	Pediatrics	Professor Associate Professor	Akira Oka Junko Takita
	Developmental Pediatrics	Associate Professor	Sachiko Kitanaka
	Pediatric Surgery	Associate Professor	Jun Fujishiro
	Pediatric Oncology	Associate Professor	Junko Takita
<b>Aging Sciences</b>	Geriatric Medicine	Professor	Masahiro Akishita
	Associate Professor	Sumito Ogawa	
<b>*Collaborative Department</b>	Aging Research	Professor	Masahiro Akishita
	Health Policy for Children and Families		



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## Surgical Sciences

<b>Surgery</b>	Thoracic Surgery	Professor	Jun Nakajima
	Cardiovascular Surgery	Professor	Minoru Ono
		Associate Professor	Yasutaka Hirata
	Gastrointestinal Surgery	Professor	Yasuyuki Seto
		Associate Professor	Sachiyo Nomura
	Hepatobiliary Pancreatic Surgery	Professor	Norihiro Kokudo
		Associate Professor	Kiyoshi Hasegawa
<b>Urology</b>	Urology	Associate Professor	Hiroshi Fukuhara
		Associate Professor	Tetsuya Fujimura
	Artificial Organ and Transplantation Division	Associate Professor	Yoshihiro Sakamoto

## Surgical Sciences

<b>Surgery</b>	Surgical Oncology	Professor	Toshiaki Watanabe
		Associate Professor	Hiroaki Nozawa
	Vascular Surgery	Professor	Toshiaki Watanabe
<b>Sensory and Motor System Medicine</b>	Breast and Endocrine Surgery	Associate Professor	Keiichiro Tada
	Dermatology	Professor	Shinichi Sato
		Associate Professor	Yoshihide Asano
	Plastic and Reconstructive Surgery	Professor	Mutsumi Okazaki
		Associate Professor	Takuya Iida
	Oral and Maxillofacial Surgery	Professor	Tsuyoshi Takato
		Associate Professor	Kazuto Hoshi
		Associate Professor	Hideto Saijo
	Orthopaedic Surgery	Professor	Sakae Tanaka
		Associate Professor	Taku Saito
	Ophthalmology	Professor	Makoto Aihara
		Associate Professor	Satoshi Kato
		Associate Professor	Toshikatsu Kaburaki
		Associate Professor	Tomohiko Usui
	Otolaryngology and Head and Neck Surgery	Professor	Tatsuya Yamasoba
<b>Vital Care Medicine</b>		Associate Professor	Shinichi Iwasaki
		Associate Professor	Kenji Kondo
	Rehabilitation Medicine	Professor	Nobuhiko Haga
	Anesthesiology	Professor	Yoshitsugu Yamada
		Associate Professor	Kanji Uchida
	Acute Medicine	Professor	Naoto Morimura
		Associate Professor	Yoichi Kitsuta

## Health Sciences and Nursing



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### Health Sciences

<b>Health Sciences</b>	Health Sociology	Associate Professor	Naoki Kondo
	Mental Health	Professor	Norito Kawakami
	Epidemiology and Preventive Health	Professor	Yutaka Matsuyama
		Associate Professor	Koji Oba
	Biostatistics/ Epidemiology and Preventive Health Sciences	Professor	Yutaka Matsuyama
		Associate Professor	Koji Oba
	Health Education	Professor	Hideki Hashimoto
	Health Promotion Sciences	Associate Professor	Yoshiyuki Takimoto
<b>Preventive and Administrative Nursing</b>	Biomedical Ethics	Professor	Akira Akabayashi
		Associate Professor	Yoshiyuki Takimoto
	Advanced Clinical Nursing	Associate Professor	Yukie Takemura
	Nursing Administration	Associate Professor	Yukie Takemura
	Family Nursing	Professor	Kiyoko Kamibeppu
	Community Health Nursing	Professor	Noriko Yamamoto-Mitani
	Public Health Nursing		

### Clinical Nursing

<b>Clinical Nursing</b>	Gerontological Home Care and Long-term Care Nursing	Professor	Noriko Yamamoto-Mitani
	Palliative Care Nursing	Professor	Noriko Yamamoto-Mitani
	Midwifery and Women's Health	Associate Professor	Megumi Haruna
	Psychiatric Nursing	Professor	Norito Kawakami
		Associate Professor	Yuki Miyamoto
	Gerontological Nursing	Professor	Hiromi Sanada
		Associate Professor	Gojiro Nakagami
	Wound Care Management	Professor	Hiromi Sanada
<b>*Collaborative Department</b>	Public Mental Health Policy		



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## International Health

<b>International Social Medicine</b>	Global Health Policy	Professor	Kenji Shibuya
	Associate Professor	Gilmour Stuart	
<b>International Biomedical Sciences</b>	Community and Global Health	Professor	Masamine Jimba
	Human Genetics	Professor	Katsushi Tokunaga
	Developmental Medical Sciences	Professor	Akihiko Mabuchi
	Associate Professor	Masashi Mizuguchi	
	Human Ecology	Associate Professor	Teruyuki Tanaka
	Biomedical Chemistry	Professor	Masahiro Umezaki
<b>*Collaborative Department</b>	Associate Professor	Tomoyoshi Nozaki	
	Tropical Medicine and Malaria	Associate Professor	Yoh-ichi Watanabe



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## School of Public Health

<b>Epidemiology and Health Sciences</b>	Biostatistics/ Epidemiology and Preventive Health Sciences	Professor	Yutaka Matsuyama
	Associate Professor	Koji Oba	
	Social and Preventive Epidemiology	Professor	Satoshi Sasaki
	Clonical Epidemiology and Health Economics	Professor	Hideo Yasunaga
<b>Behavioral Health Sciences</b>	Health Communication	Professor	Takahiro Kiuchi
	Associate Professor	Hirono Ishikawa	
	Mental Health	Professor	Norito Kawakami
	Health Sociology and Health Education	Associate Professor	Naoki Kondo
	Health and Social Behavior	Professor	Hideki Hashimoto
<b>Health Services Sciences</b>	Health Promotion Sciences	Associate Professor	Yoshiyuki Takimoto
	Biomedical Ethics	Professor	Akira Akabayashi
	Associate Professor	Yoshiyuki Takimoto	
	Health Policy	Professor	Yasuki Kobayashi
	Associate Professor	Satoshi Toyokawa	
<b>*Collaborative Department</b>	Healthcare Informatics	Professor	Kazuhiko Ohe
	Clinical Information Engineering	Professor	Hiroshi Oyama
	Forensic Medicine and Medical Law	Professor	Hirotaro Iwase
	Associate Professor	Yohsuke Makino	
	Public Health Science		



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## Center for Disease Biology and Integrative Medicine

Director Shigeo Okabe

Laboratory of Molecular Biomedicine for Pathogenesis	Professor	Toru Miyazaki
Associate Professor	Satoko Arai	
Laboratory of Structural Physiology	Professor	Haruo Kasai
Laboratory of Biomedical Equipment and Biomaterial	Professor	Takashi Azuma
Associate Professor	Taichi Ito	
Laboratory of Clinical Biotechnology	Professor	Ungil Chung
Associate Professor	Shinsuke Ohba	
Laboratory of Environmental and Metabolic Health Sciences	Professor	Makoto Murakami
Associate Professor	Seiichiroh Ohsako	
Laboratory of Animal Resources	Professor	Atsu Aiba
Associate Professor	Kazuki Nakao	
Associate Professor	Hidetoshi Kassai	
Laboratory of Molecular Radiology	Professor	Kiyoshi Miyagawa
Biomedical Infomatics	Associate Professor	Takeshi Imai
Divisions of Research Resources and Support (Section of Animal Research)	Professor	Atsu Aiba
(Section of Radiation Biology)	Professor	Kiyoshi Miyagawa
(Section of Biomedical Infomatics)	Associate Professor	Takeshi Imai



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## The International Research Center for Medical Education

Director Tatsuya Yamasoba

Department of Medical Education Studies	Professor	Masato Eto
Department of International Cooperation for Medical Education		



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## Global Nursing Research Center

Director Hiromi Sanada

Division of Care Innovation	Professor	Hiromi Sanada
	Project Associate Professor	Makoto Oe
Division of Nursing System	Professor	Kiyoko Kamibeppu
	Professor	Noriko Yamamoto-Mitani
	Associate Professor	Yukie Takemura
	Associate Professor	Yuki Miyamoto
	Associate Professor	Megumi Haruna



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## Institution

The Office of International Academic Affairs	Head	Yasuyuki Seto
Medical Scientist Training Program	Head	Haruhiko Bito
Office for Research Ethics Support	Director	Yutaka Yatomi
	Vice Director	Akira Akabayashi
Life Sciences Core Facility	Head	Yoshihiro Kita
The Office for Clinical Practice and Medical Education	Head	Tatsuya Yamasoba
Medical Library	Head	Tsuyoshi Takato
Museum of Health and Medicine	Head	Kazuhiko Ohe

## Endowed Department

Department of Bone & Cartilage Regenerative Medicine	Project Associate Professor	Takumi Matsumoto
Department of Cartilage & Bone Regeneration (Fujisoft)	Project Associate Professor	Atsuhiko Hikita
Immunotherapeutics	Project Professor	Kazuhiro Kakimi
Department of Advanced Clinical Science and Therapeutics	Project Associate Professor	Junichi Suzuki
Computational Diagnostic Radiology and Preventive Medicine	Project Professor	Naoto Hayashi
	Project Associate Professor	Kansei Uno
	Project Associate Professor	Takeharu Yoshikawa
Healthcare Safety Management (Tokio Marine & Nichido)	Project Associate Professor	Masaki Anraku
Clinical Trial Data Management		
Ubiquitous Preventive Medicine	Project Associate Professor	Yuichi Ikeda
Science for Joint Reconstruction	Project Associate Professor	Toru Moro
Therapeutic Strategy for Heart Failure	Project Associate Professor	Masaru Hatano
Molecular Structure and Dynamics	Project Professor	Nobutaka Hirokawa
Department of Medical Genomics	Project Associate Professor	Masahito Kawadu
Continenence Medicine	Project Professor	Yasuhiro Igawa
Department of Life Support Technology (Molten)	Project Professor	Taketoshi Mori
Department of Youth Mental Health		
AXA Chair on Health and Human Security	Project Professor	Manami Inoue
Department of Advanced Translational Research and Medicine in Management of Pulmonary Hypertension	Project Associate Professor	Hideki Takimoto
Department of Immunotherapy Management	Project Associate Professor	Hiroko Kanda
Chronic kidney disease pathophysiology	Project Associate Professor	Reiko Inagi
Department of medical research and management for musculoskeletal pain	Project Professor	Koh Matsudaira
Department of Molecular Science on Diabetes	Project Associate Professor	Hiroyuki Oka
Integrated Molecular Sciences on Metabolic Diseases	Project Associate Professor	Hironori Waki
Department of Osteoimmunology	Project Associate Professor	Masato Iwabu
Department of medical and pharmaceutical community healthcare	Project Professor	Hirohisa Imai
Health Economy and Society Policy	Project Professor	Tomoyuki Takura
Department of Biostatistics and Bioinformatics	Project Professor	Daisuke Koide
	Project Associate Professor	Akihiro Hirakawa
Department of Preventive Medicine for Locomotive Organ Disorders	Project Professor	Noriko Yoshimura
Department of Molecular Neurology	Project Professor	Shoji Tsuji
	Project Associate Professor	Jun Mitsui
Laboratory for New Generation Drug Discovery	Project Associate Professor	Shigeru Matsuoka

## Social Cooperation Program

Department of Ubiquitous Health Informatics	Project Associate Professor	Kayo Waki
Department of Lipidomics	Project Professor	Takao Shimizu
	Project Associate Professor	Fuyuki Tokumasu
Advanced Nursing Technology	Project Associate Professor	Ryoko Murayama
Verbal analysis of pathophysiology	Project Associate Professor	Shinichi Tokuno
Department of Health Services Research	Project Associate Professor	Taisuke Jo
Skincare Science	Project Associate Professor	Takeo Minematsu
Department of Healthcare Quality Assessment	Project Professor	Hiroaki Miyata
	Project Associate Professor	Kan Nawata
Bariatric & Metabolic Care	Project Associate Professor	Susumu Aikou
Imaging Nursing Science	Project Associate Professor	Koichi Yabunaka

## Research Unit

Nurturing leaders to pave the way for the future of medicine, Medical innovation initiative	Project Associate Professor	Makoto Yoshimoto
Nurturing leaders to pave the way for the future of medicine	Project Associate Professor	Takashi Yamanaka
Graduate Program for Leaders in Life Innovation	Project Associate Professor	Shogo Ehata
Graduate Program for Leaders in Life Innovation	Project Associate Professor	Tadafumi Hashimoto
Global Leader Program for Social Design and Management	Project Associate Professor	Jung Su Lee

## Faculty of Medicine

Dean Kohei Miyazono

School of Medicine	Cell Biology and Anatomy / Biochemistry and Molecular Biology / Physiology / Pharmacology / Pathology / Microbiology / Immunology / Radiology / Biomedical Engineering / Basic Neuroscience / Integrative Medical Neuroscience / Clinical Neuroscience / Occupational, Environmental and Preventive Medicine / Medical Principles and Medical Ethics / Forensic Medicine, and Medical Informatics and Economics / Medicine I / Medicine II / Clinical Laboratory Medicine and Pathology / Obstetrics and Gynecology / Pediatric Science / Aging Science / Surgery / Sensory and Motor System Medicine / Vital Care Medicine
School of Integrated Health Sciences	Family Nursing / Community Health Nursing / Fundamental Nursing / Gerontological Nursing / Midwifery and Women's Health / Adult Health and Nursing / Mental Health and Nursing / Health Sociology / Health Administration / Epidemiology and Biostatistics / Human Ecology / Biochemistry and Nutrition / Maternal and Child Health



## Clinical Division

## Department of Internal Medicine

General Internal Medicine	Professor	Masaomi Nangaku
Cardiovascular Medicine	Professor	Issei Komuro
Respiratory Medicine	Professor	Takahide Nagase
Gastroenterology	Professor	Kazuhiko Koike
Nephrology and Endocrinology	Professor	Masaomi Nangaku
Diabetes and Metabolic Diseases	Professor	Takashi Kadowaki
	Associate Professor	Toshimasa Yamauchi
Hematology and Oncology	Professor	Mineo Kurokawa
Allergy and Rheumatology		
Infectious Diseases	Professor	Kyoji Moriya
	Associate Professor	Syu Okugawa
Neurology	Associate Professor	Jun Shimizu
Geriatric Medicine	Professor	Masahiro Akishita
	Associate Professor	Sumito Ogawa
Psychosomatic Medicine	Professor	Akira Akabayashi
	Associate Professor	Kazuhiro Yoshiuchi
	Associate Professor	Yoshiyuki Takimoto

## Department of Surgery

General Surgery	Professor	Toshiaki Watanabe
Stomach and Esophageal Surgery	Professor	Yasuyuki Seto
	Associate Professor	Sachiyo Nomura
Colon and Rectal Surgery	Professor	Toshiaki Watanabe
	Associate Professor	Hiroaki Nozawa
Hepatobiliary Pancreatic Surgery	Associate Professor	Kiyoshi Hasegawa
	Associate Professor	Yoshihiro Sakamoto
Vascular Surgery	Professor	Toshiaki Watanabe
	Associate Professor	Hiroaki Nozawa
Breast and Endocrine Surgery	Associate Professor	Keiichiro Tada
Artificial Organ and Transplantation Surgery	Professor	Kiyoshi Hasegawa
	Associate Professor	Yoshihiro Sakamoto
Cardiovascular Surgery	Professor	Minoru Ono
	Associate Professor	Yasutaka Hirata
Thoracic Surgery	Professor	Jun Nakajima
Neurosurgery	Professor	Nobuhito Saito
	Associate Professor	Hirofumi Nakatomi
Anesthesiology and Pain Relief Center	Professor	Yoshitsugu Yamada
	Associate Professor	Kanji Uchida
Urology and Andrology	Associate Professor	Hiroshi Fukuhara
	Associate Professor	Tetuya Fujimura
Gynecologic Surgery	Professor	Yutaka Osuga
	Associate Professor	Katsutoshi Oda
	Associate Professor	Osamu Hiraike
	Associate Professor	Kaori Koga

## Department of sensory and Motor System Medicine

Dermatology	Professor	Shinichi Sato
	Associate Professor	Yoshihide Asano
Ophthalmology	Professor	Makoto Aihara
	Associate Professor	Satoshi Kato
	Associate Professor	Toshikatsu Kaburaki
Orthopaedic Surgery and Spinal Surgery	Professor	Sakae Tanaka
	Associate Professor	Taku Saito
Otolaryngology and Head and Neck Surgery	Professor	Tatsuya Yamasoba
	Associate Professor	Shinichi Iwasaki
	Associate Professor	Kenji Kondo
Rehabilitation Medicine	Professor	Nobuhiko Haga
Plastic, Reconstructive and Aesthetic Surgery	Associate Professor	Takuya Iida
Oral-Maxillofacial Surgery and Orthodontics	Professor	Tsuyoshi Takato
	Associate Professor	Kazuto Hoshi
	Associate Professor	Hideto Saijo

<b>Department of Pediatrics, Perinatal and Women's Medicine</b>	Pediatrics	Professor	Akira Oka
		Associate Professor	Sachiko Kitanaka
		Associate Professor	Junko Takita
<b>Department of Neuropsychiatry</b>	Pediatric Surgery	Associate Professor	Jun Fujishiro
	Obstetrics and Gynecology	Professor	Tomoyuki Fujii
		Associate Professor	Kaori Koga
<b>Department of Radiology</b>		Associate Professor	Takeshi Nagamatsu
	Neuropsychiatry	Professor	Kiyoto Kasai
		Associate Professor	Chihiro Kakiuchi
		Associate Professor	Seiichiro Jinde
	Radiology	Professor	Osamu Abe
		Associate Professor	Keiichi Nakagawa
		Associate Professor	Harushi Mori
		Associate Professor	Hidemasa Takao

## Central Clinical Facilities

Pharmaceutical Department	Professor	Hiroshi Suzuki
Department of Clinical Laboratory	Professor	Yutaka Yatomi
	Associate Professor	Hitoshi Ikeda
Surgical Center	Professor	Hiroshi Yasuhara
	Associate Professor	Kazuhiko Fukatsu
Imaging Center	Professor and Director	Osamu Abe
Emergency Service	Professor	Naoto Morimura
	Associate Professor	Yoichi Kitsuta
	Associate Professor	Susumu Nakajima
Department of Blood Transfusion	Professor	Hitoshi Okazaki
Perinatal Center	Professor	Tomoyuki Fujii
	Professor	Naoto Takahashi
Rehabilitation Service	Professor	Nobuhiko Haga
Department of Medical Engineering		
Central Supply Service	Associate Professor	Kazuhiko Fukatsu
Intensive Care Unit	Professor	Naoto Morimura
	Associate Professor	Yoichi Kitsuta
Pathology	Professor	Masashi Fukayama
	Associate Professor	Tetsuo Ushiku
	Associate Professor	Takeshi Sasaki
Department of Corneal Transplantation	Associate Professor	Tomohiko Usui
Department of Cell Therapy and Transplantation Medicine	Professor	Mineo Kurokawa
Department of Endoscopy and Endoscopic Surgery	Associate Professor	Mitsuhiko Fujishiro
Department of Hemodialysis and Apheresis	Professor	Masaomi Nangaku
Medical Community Network and Discharge Planning	Professor	Kiyoto Kasai
	Associate Professor	Masahiko Sumitani
Infection Control and Prevention Service	Professor	Kyoji Moriya
Department of Planning, Information and Management	Professor	Kazuhiko Ohe
University Hospital Medical Information Network Center	Associate Professor	Hirono Ishikawa
Organ Transplantation Service	Associate Professor	Kiyoshi Hasegawa
Labor Safety and Health Management Office		
Child Psychiatry	Associate Professor	Yukiko Kano
Tissue Bank	Associate Professor	Sumihito Tamura
Epidemiology and Preventive Medicine	Professor	Tsutomu Yamazaki
Cancer Resource Center	Associate Professor	Sachiyo Nomura
Center for Liaison and Public Relations	Professor	Toshiaki Watanabe
Datebase Center of the National University Hospitals		
Department of Chemotherapy	Professor	Norihiro Kokudo
Department of Medical Record Management	Professor	Toshiaki Watanabe
	Professor	Kazuhiko Ohe

Critical Care Center	Professor	Naoto Morimura
Department of Pain and Palliative Medicine	Associate Professor	Yoichi Kitsuta
Children's Medical Center	Associate Professor	Masahiko Sumitani
Department of Disaster Medical Management	Professor	Akira Oka
International Medical Center	Associate Professor	Jun Fujishiro
Department of Clinical Nutrition Therapy	Professor	Naoto Morimura
Nursing Department	Associate Professor	Sumihito Tamura
Administration Office	Associate Professor	Naoto Kubota

## Clinical Research Division

Clinical Research Support Center	Professor	Tsutomu Yamazaki
22nd Century Medical and Research Center	Associate Professor	Chie Sakanaka
Department of Tissue Engineering	Professor	Tsuyoshi Takato
Cooperative Unit of Medicine and Engineering Research	Project Professor	Kazuhiro Kakimi
Translational Research Center	Professor	Tsuyoshi Takato
Center for Genome Medicine	Associate Professor	Kazuto Hoshi
Unit for Early and Exploratory Clinical Development	Professor	Minoru Ono
	Professor	Mineo Kurokawa
	Professor	Masaomi Nangaku
	Professor	Takeshi Iwatsubo

## Organization of Clinical Management Support

Department of Personnel Administration and Human Resource Management	Professor	Masaomi Nangaku
Medical Specialists Training Center	Associate Professor	Susumu Nakajima
Department of Performance Monitoring and Risk Management	Professor	Shinichi Sato
Office of Performance Monitoring	Professor	Kyoji Moriya
Medical Safety management Center	Associate Professor	Yoshiyuki Takemoto
Infection Control Center	Professor	Toshiaki Watanabe
Patient Relations and Clinical Ethics Center	Associate Professor	Shinichi Sato
Department of Highly Advanced Novel Medical Technologies Evaluation	Professor	Masahiro Akishita
Department of Unapproved New Drugs and Medical Devices Evaluation	Professor	Masahiro Akishita
Department of Education and Staff Development	Professor	General Education Center
Hospitality Center	Professor	Kiyoto Kasai
Department of Hospital Planning and Management	Professor	Sakae Tanaka
Department of Research Support	Professor	Masaomi Nangaku
Department of Clinical Research Gavernance	Project Professor	Takashi Moritoyo

## Organization of Clinical Management

Inpatient Services Administration	Professor	Mineo Kurokawa
Admission and Discharge Center	Professor	Kiyoshi Miyagawa
Cancer Board	Professor	Kiyoto Kasai
Outpatient Services Administration	Professor	Masahiko Sumitani
Central Clinical Services Administration	Associate Professor	Masahiko Sumitani
Vascular Board	Associate Professor	Hiroshi Yasuhara
Perioperative Assessment Center	Professor	Hiroko Kanda
Epilepsy Center	Project Associate Professor	
Immunotherapy Center		



# Faculty of Medicine

## Graduate School of Medicine

### The University of Tokyo

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Medical Scientist Training Program  
Office for Research Ethics Support  
Life Sciences Core Facility  
The Office for Clinical Practice and Medical Education  
Medical Library  
Museum of Health and Medicine



## Molecular Cell Biology

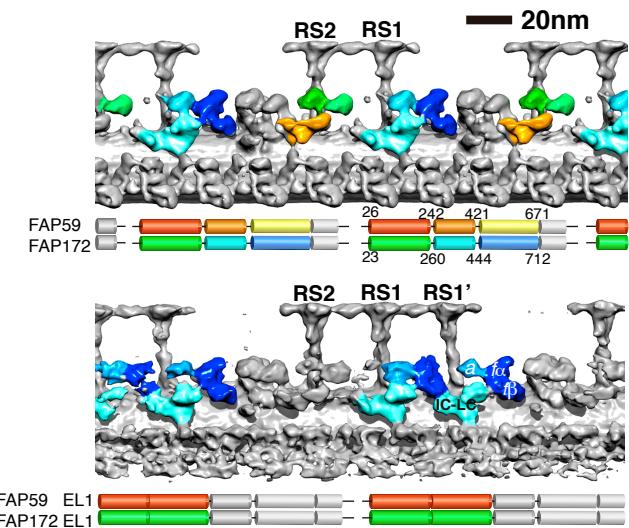
### Structural Biology

Kikkawa lab is interested in flagella/cilia, which works as a propeller as well as a sensor of cells. We are studying the regulatory mechanism of flagella/cilia using cryo-electron microscopy, optical microscopy with high-speed camera, cell biology, and genetics. We are also developing new technologies to analyze images taken by the microscopes.

Our focuses are:

- Molecular mechanisms of flagella and axonemal dyneins
- Structures of microtubule-associated proteins
- Development of new image analysis methods for cryo-electron microscope and high-speed camera

<http://structure.m.u-tokyo.ac.jp/>



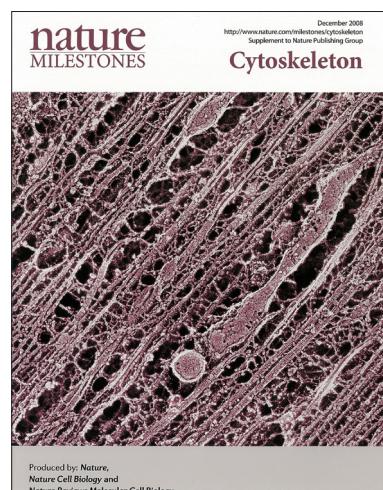
The 3D structures of axoneme visualized by cryo-electron tomography.  
Below is the diagram of corresponding "ruler" proteins.

### Structural Cell Biology

<http://cb.m.u-tokyo.ac.jp/>

Our research aims to elucidate the cellular architecture, especially focusing on the cytoskeleton by combining molecular cell biology, molecular genetics and structural biology.

- Structure of the cytoskeleton and the related proteins
- Dynamics of the cytoskeleton and the related proteins
- Function of the cytoskeleton and the related proteins

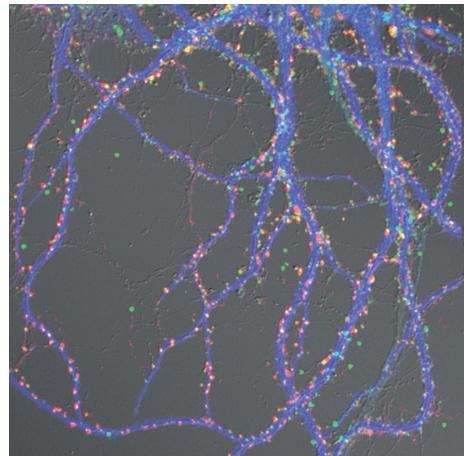


The neuronal cytoskeleton  
(From Nature Milestones 2008)

## Cellular Neurobiology

The Laboratory of Cellular Neurobiology is interested in understanding the molecular mechanisms regulating synapse formation and maintenance, which are essential in proper function of neural circuits in the brain. The laboratory is using optical imaging of synaptic molecules in live neurons, in combination with molecular biological approaches to modify neuronal functions.

- Molecular architecture of the postsynaptic density
- Molecular mechanisms of activity-dependent synapse remodeling
- Regulation of synapse functions by glial cells
- Regulation of synapse formation and maintenance in vivo
- Synapse dysfunction in psychiatric diseases



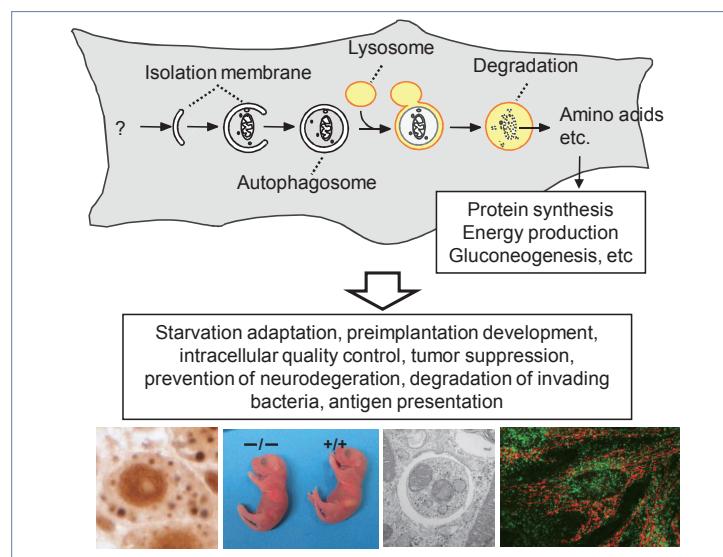
Quantitative fluorescence imaging of cultured hippocampal neurons (green: postsynaptic protein and calibrated fluorescent microspheres, red: presynaptic protein, blue: microtubule-associated protein)

## Molecular Biology

<http://molbiol.umin.jp/>

Our laboratory has been doing trans-disciplinary studies on autophagy, an intracellular degradation system, and trying to understand the mechanisms and biological and pathophysiological functions of autophagy.

- Molecular mechanism of autophagy (its regulation, membrane dynamism, selectivity, etc.)
- Physiological and pathophysiological roles of autophagy
- Development of new methods for monitoring and modulating autophagy

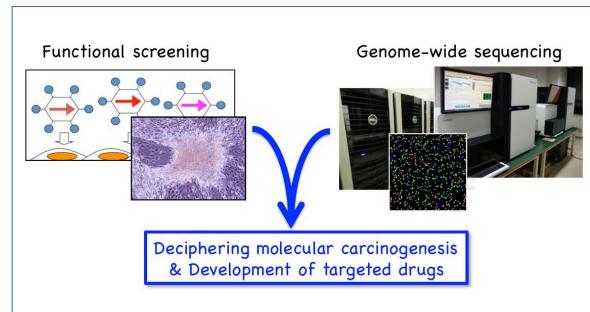


## Cellular Signaling

<http://mano-lab.umin.jp/english/index.html>

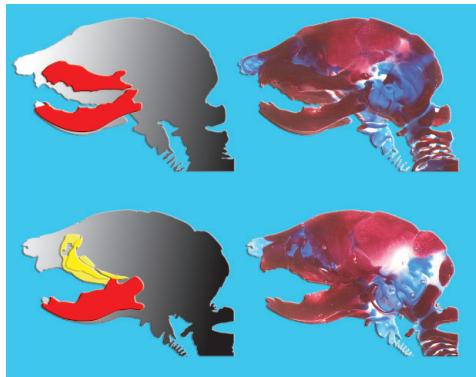
Through a combined approach of our original functional screening system and cancer-genome resequencing, we aim to identify essential growth drivers in human cancer and to develop effective means to treat this intractable disorder. Our research is conducted in a tight collaboration with Department of Medical Genomics.

- Discovery of genetic changes directly responsible for carcinogenesis
- Identification of therapeutic targets in human cancer
- Development of novel molecular diagnostics for cancer

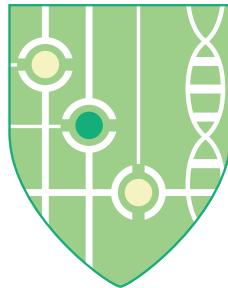


We are investigating signaling mechanisms underlying cell fate determination, morphogenesis and organogenesis in embryonic development.

- Molecular mechanisms of neural crest fate determination and craniofacial morphogenesis
- Molecular mechanisms of cardiovascular development
- Molecular mechanisms of stress responses in preimplantation development
- Roles of non-coding RNA in embryonic development



Transformation of the upper jaw into a lower jaw in endothelin-1 knock-in (misexpressing) mouse (upper). The lower is the wild-type control.



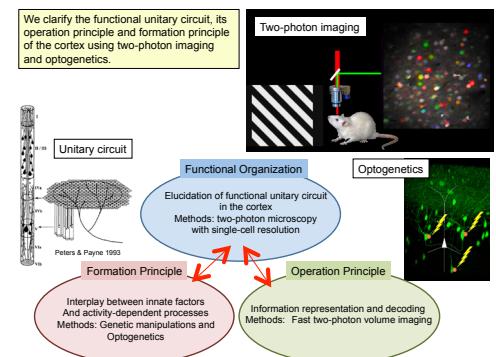
## Functional Biology

### Integrative Physiology

The cerebral cortex acquires complicated response selectivity by receiving and processing information from the outside of the world. However, it is still unknown what kind of neural circuit actually is involved this information processing. In recent years, progress of imaging technology (two-photon excitation method) has made it possible to simultaneously measure the activity of thousands of nerve cells from a living animal (Ohki et al., 2005, 2006). In addition to that, various technologies for studying neural circuits are being developed one after another and research on neuroscience is entering a transition era. In our laboratory, by using these latest methods, we are trying to find out how the neural circuits of mammalian visual cortex process information.

- Functional organization in the visual cortex
- Development of neural circuits in the visual cortex
- Information representation in the visual cortex
- Roles of each cell-type in the processing of visual information

<http://www.physiol2.med.kyushu-u.ac.jp/>

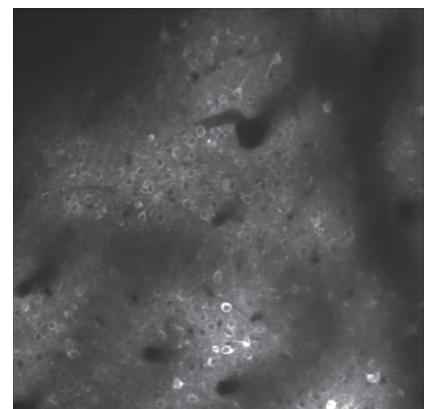


### Cellular and Molecular Physiology

Our laboratory studies the neural circuits in the frontal cortex, which emerge movement and thought. Applying two-photon imaging, optogenetics, and electrophysiology to behaving mice and marmosets, we measure and manipulate the activities of multiple neurons and analyze their dynamics.

- Neural circuits for motor learning and motor execution.
- Neural circuits for decision making.
- Neural circuits for brain-machine-interface.
- Development of novel fluorescent microscopy system.

<http://plaza.umin.ac.jp/~Matsuzaki-Lab/>

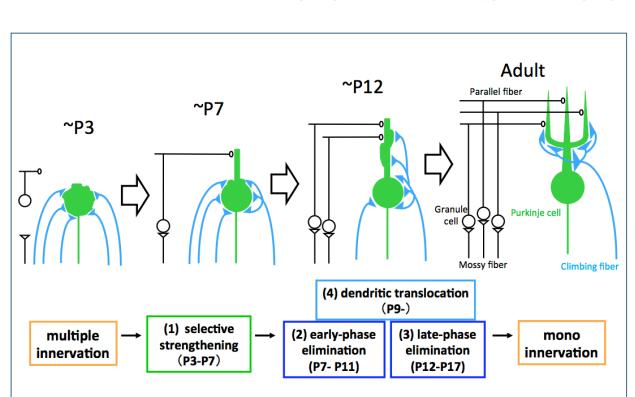


Two-photon image of the mouse motor cortical neurons

## Neurophysiology

Our laboratory studies the function of the synapse, a key structure for brain functions, and its changes related to postnatal development, learning, and memory. We monitor neural activity in real time using various methodologies including; electrophysiology, molecular biology, and optical imaging of functional molecules.

- Postnatal development of synaptic function and organization in the cerebellum
- Retrograde synaptic modulation mediated by endogenous cannabinoids
- Synaptic integration in intact animals
- Synaptic plasticity and motor learning in the cerebellum

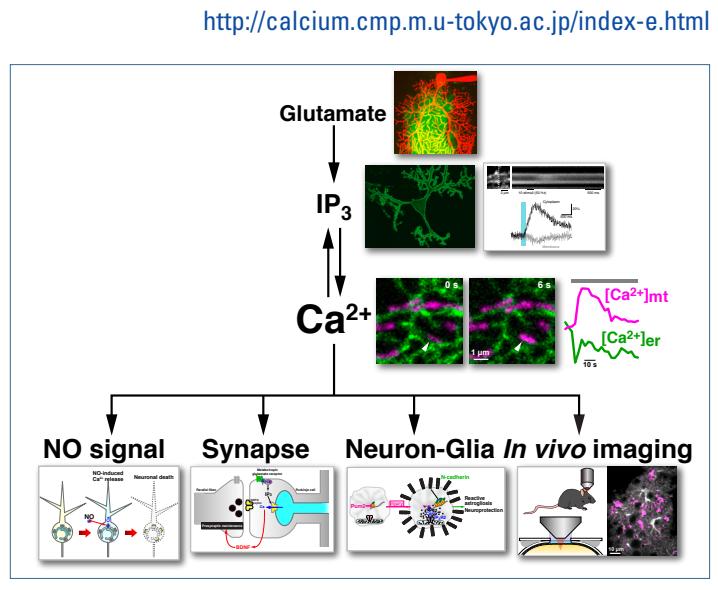


Postnatal development of cerebellar climbing fiber to Purkinje cell synapses

## Cellular and Molecular Pharmacology

We are studying the basic principles of  $\text{Ca}^{2+}$  signaling, the fundamental signal transduction mechanism of life. Based on such studies, we are searching for new functions of  $\text{Ca}^{2+}$  signaling in the central nervous system, and are aiming at shedding new light on brain functions using innovative imaging methods.

- Elucidation of basic principles of  $\text{Ca}^{2+}$  signaling
- Search for new functions of  $\text{Ca}^{2+}$  signaling in the brain
- Functional analyses of neurons and glial cells using imaging methods of signaling molecules

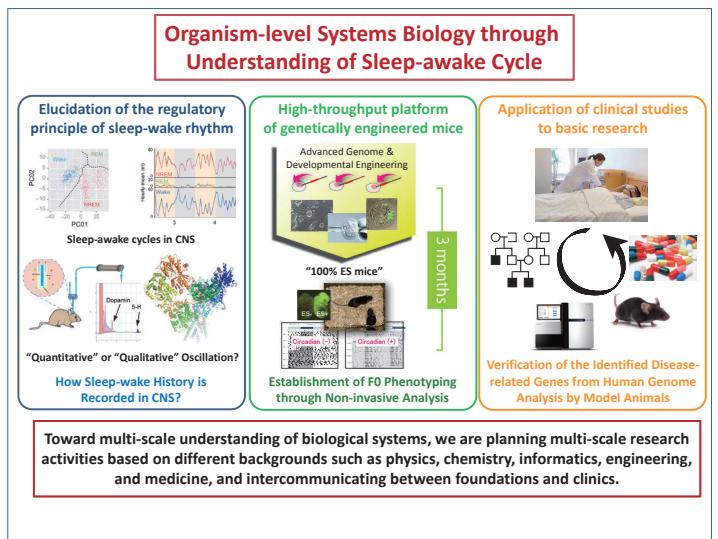


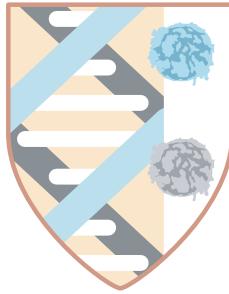
Outline of our research on  $\text{Ca}^{2+}$  signaling

## Systems Pharmacology

We are aiming at understanding of how multi-stability and homeo-dynamics in sleep-wake systems, as a model system, can be achieved through negative feedback regulation of membrane potential in neurons, and neural circuit structures. Also, we are establishing a high-throughput production platform of genetically engineered mice to facilitate a quantitative analysis and perturbation at the organismal level, and paving the way for the basic research by associating with human genome analysis obtained from clinical studies.

- Elucidation of the regulatory principle of sleep-wake rhythm
- High-throughput production platform of genetically engineered mice
- Application of human genome analysis from clinical studies to basic research





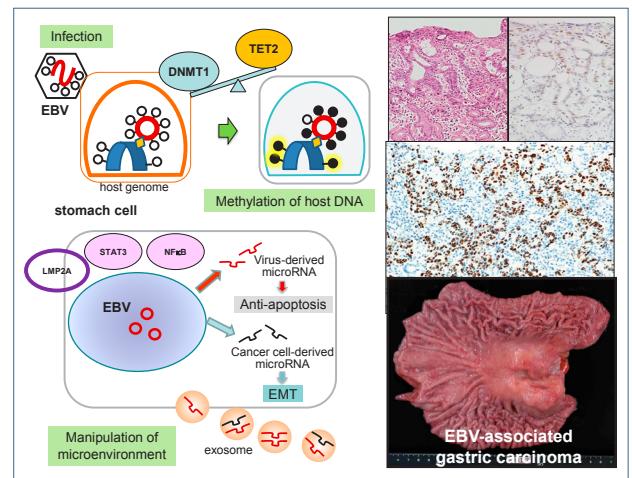
# Pathology, Immunology and Microbiology

## Pathology and Diagnostic Pathology

[http://pathol.umin.ac.jp/index\\_e.htm](http://pathol.umin.ac.jp/index_e.htm)

We investigate the pathogenesis and pathobiology of diseases, especially the neoplastic diseases, by means of morphology. Our goal is to discover new entities and to clarify unknown pathogenesis of diseases through the interaction with clinical medicine.

- Chronic inflammation and cancer
  - Epstein-Barr virus associated gastric carcinoma
  - Cancer epigenetics (DNA methylation, microRNA)
  - Stem cell and epithelial-mesenchymal interaction
  - Cancer classification for individualized medicine (stomach, liver, genito-urinary tract, lung)
- Application of molecular pathology to diagnostic pathology
  - genome pathology, clinical sequencing
  - Discovery of molecular target for cancer therapy
  - Proteome pathology
- Next generation diagnostic pathology
  - Tele-pathology, digital pathology, application of artificial intelligence
  - Promotion of CPC education

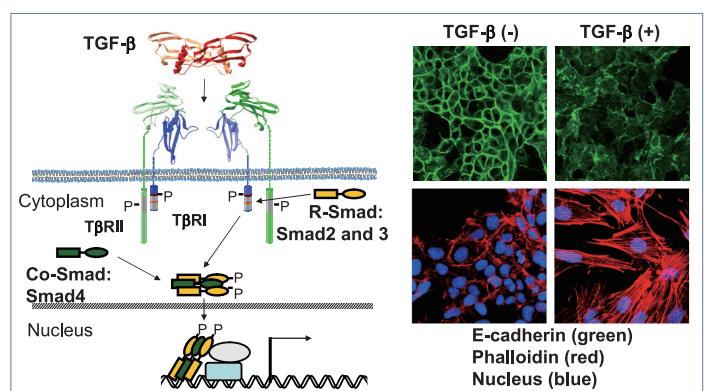


## Molecular Pathology

<http://beta-lab.umin.ac.jp/index.htm>

We study signaling mechanisms of the TGF- $\beta$  family proteins, and elucidate how they regulate progression of cancers. Mechanisms of regulation of TGF- $\beta$ -Smad target genes will be studied by genome-wide approaches. Based on these findings, we will develop new strategies for the treatment of cancer.

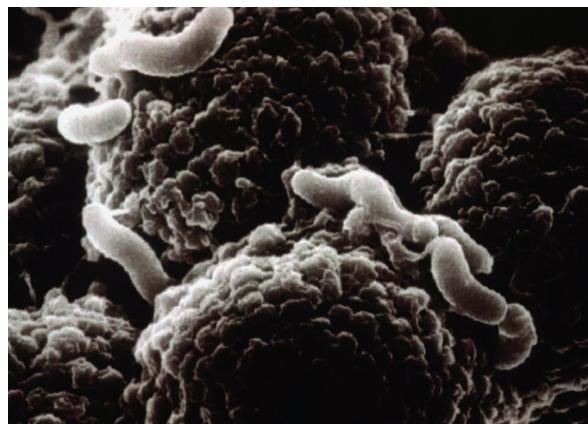
- Dynamic changes in the transcriptional machinery regulated by TGF- $\beta$
- Roles of TGF- $\beta$  in epithelial-mesenchymal transition (EMT)
- Effects of TGF- $\beta$  family cytokines on cancer-initiating cells
- Roles of tumor microenvironment - approach by orthotopic transplantation models



Signaling by TGF- $\beta$  (left) and TGF- $\beta$ -mediated EMT of mammary epithelial cells (right)

Our major objective is to elucidate molecular mechanisms underlying development of gastric carcinoma triggered by infection with *Helicobacter pylori*. Based on the results obtained from these studies, we are also developing new strategies for prevention and treatment of infection/inflammation-associated cancers, which account for ~ 50% of entire human malignancies.

- Structural biological analysis of *H. pylori* oncprotein CagA
- Intracellular signaling pathways targeted by CagA
- Mouse genetic studies on gastric carcinogenesis
- Host genetic factors determining gastric cancer susceptibility
- Molecular mechanisms linking inflammation and cancer



*H. pylori* - gastric epithelial cell interaction

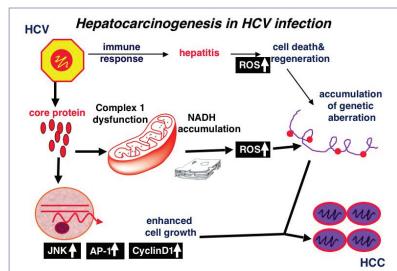
## Infection Control and Prevention

We are engaged in education of medical staff as well as in daily clinical activities on the prevention of healthcare-associated infection (HAI). Research activities on the pathogenesis of infection with hepatitis viruses and HIV, in particular, on the mechanism of hepatocarcinogenesis in HCV infection are also our mission.

- Development of preemptive strategies for the control of healthcare-associated infection
- Development of new methods in infection control and treatment of viral hepatitis
- Molecular pathogenesis of hepatocellular carcinoma in HCV infection
- Pathogenesis of progression of HIV infection
- Molecular pathogenesis of the mitochondrial disturbances in viral infections
- Molecular pathogenesis of hepatitis B viral infection
- Host defences to microorganisms
- Molecular analysis of innate immunity in microorganism infection
- New detection method and pathogenesis of opportunistic cytomegaloviral infection
- Mechanism of multi-drug resistant microorganisms
- Molecular epidemiology of *Clostridium difficile*



Infection control team rounds

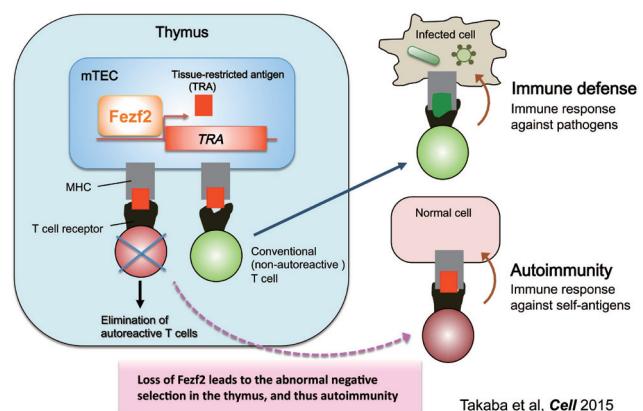


## Immunology

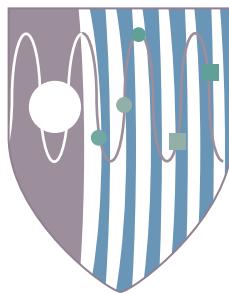
We aim to comprehensively understand immune responses by analyzing molecular mechanisms of the development of immune cells and the regulation of innate and adaptive immune systems, and to provide novel strategies for the treatment of immune diseases. We focus on the molecules and immune cells that contribute to autoimmune diseases, employing genetically modified mice to address their physiological significance *in vivo*.

- Animal models for studying immune cells by genome engineering technology
- Molecular mechanisms of immune cell development
- Role of immune tissue microenvironment in immune cell regulation
- Mechanisms and pathogenesis of autoimmune diseases
- Regulation of bone metabolism by the immune system
- Regulation of immune cells in bone microenvironment

### The Molecular Mechanisms of Immune Tolerance



Takaba et al, *Cell* 2015



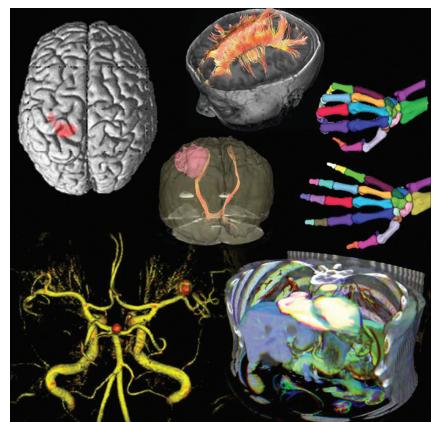
# Radiology and Biomedical Engineering

## Radiology

We have been performing a variety of clinically oriented research programs in biomedical imaging, voxel-based or ROI-based analysis, information analysis and radiotherapy, such as computer-assisted diagnosis (CAD), PET-based diagnosis, and intensity modulated radiotherapy (IMRT).

- Diagnostic Radiology
  - Multi-row detector (up to 320 rows) helical computed tomography
  - MR imaging, MR digital subtraction angiography, perfusion imaging, and diffusion tensor/kurtosis imaging, resting state fMRI
- Radiation Oncology
  - Physical engineering aspect of radiotherapy
  - Stereotactic irradiation by gamma knife and synergy system and IMRT
  - Clinical and biological studies for reduction of radiation-induced damage
- Nuclear Medicine
  - Functional imaging by radioisotope-labeled tracer technology
  - Evaluation of blood flow, metabolism, synaptic function and aggregated proteins (amyloid, tau etc.) by emission tomography (PET and SPECT)
  - Research and development of targeted radionuclide tumor therapy

<http://www.ut-radiology.umin.jp/>



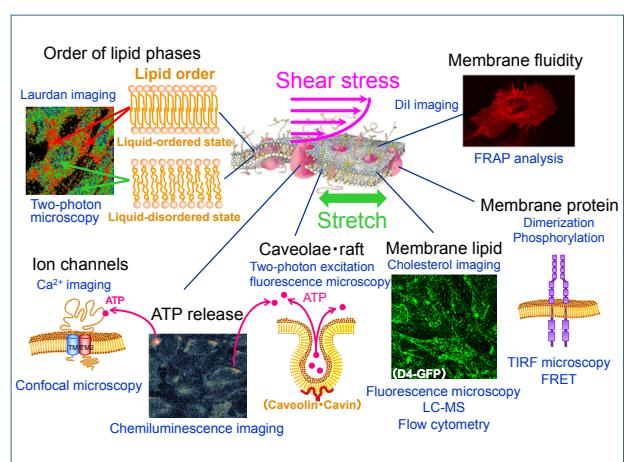
Representative images analyzed with computer-assisted technology

## System Physiology

We study biomechanics dealing with mechanical phenomena in the human body, especially focusing on cellular sensing and mechanisms underlying the responses to mechanical stimuli. The main theme of our work is to elucidate how vascular endothelial cells sense hemodynamic forces (i.e., shear stress and cyclic stretch) generated by blood flow and blood pressure. This would be of benefit not only for understanding the blood flow-mediated regulation of vascular functions, angiogenesis and vascular remodeling, but also for the elucidation of clinically important problems, such as the development of atherosclerosis and cerebral aneurysms.

- Mechanosensing and mechanotransduction
- Hemodynamic force-induced cellular responses
- Hemodynamic force-mediated gene regulation

[http://square.umin.ac.jp/bme/research\\_Eng.html](http://square.umin.ac.jp/bme/research_Eng.html)



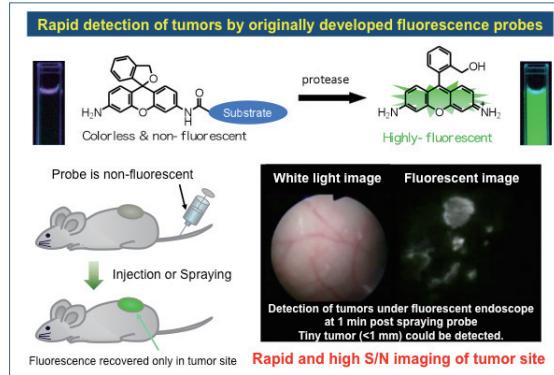
Analysis of mechanosensing molecular mechanisms in vascular endothelial cells

## Chemical Biology and Molecular Imaging

<http://cbmi.m.u-tokyo.ac.jp/>

Our research field is so-called chemical biology. One of our main research interests is to develop novel small molecule-based photo-functional tools for biological and medical research, including fluorescence probes for detecting various events in living cells and animals. Recently, we have succeeded to develop fluorescence probes for *in vivo* tumor detection, and they are now applied to real resected human samples by collaborating with many surgeons.

- Establishment of rational design strategies for various photo-functional small molecule-based probes
- Development of novel fluorescence probes, photosensitizing probes and caged compounds, and their application to various living biological samples
- *In vivo* detection and therapy of tumors in model mice and real human samples by using rationally designed novel fluorescence and photosensitizing probes

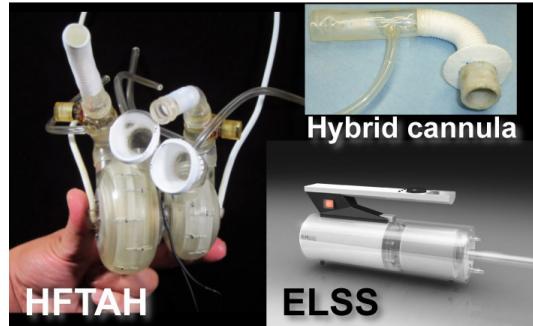


## Biosystem Construction and Control

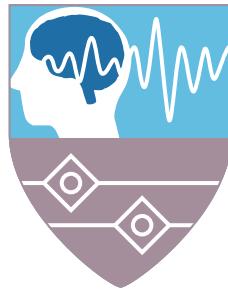
[http://www.bme.gr.jp/bme\\_E/](http://www.bme.gr.jp/bme_E/)

Our research fields include medical engineering technologies represented by the artificial organs. Especially in the research of the artificial heart, the goat whose heart was replaced with the new type of the total artificial heart survived for more than three months. To rescue the life of cardiopulmonary arrest patients, the compact emergency life support system has been developed. Other than these, researchs and developments of bio-compatible materials, sensors, new diagnostic devices and an implantable artificial kidney have been performed.

- Artificial heart
- Emergency life support system
- Hybrid technology of biological and artificial materials
- New blood pumps
- Implantable pressure sensor
- Implantable artificial kidney



Helical flow total artificial heart (HFTAH), hybrid cannula and compact emergency life support system (ELSS)

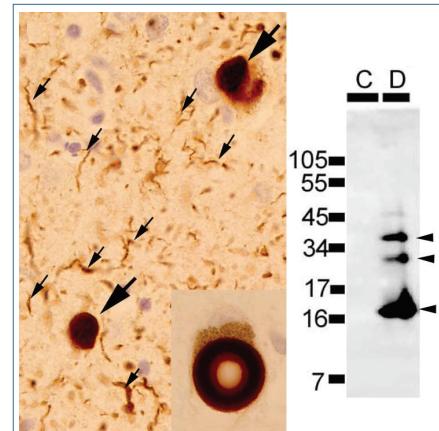


# Neuroscience

## Neuropathology

Elucidate the pathomechanism of neuronal degeneration and death in major neurodegenerative disorders (e.g., Alzheimer disease, Parkinson disease), and develop novel strategies for disease-modifying therapies.

- Structural and functional analysis of  $\gamma$ -secretase
- Molecular analysis of the mode of action of  $\gamma$ -secretase inhibitors
- Mechanism of A $\beta$  production, aggregation and clearance
- Pathological function of  $\beta$ -amyloid binding proteins (e.g., CLAC)
- Mechanism of aggregation and neurotoxicity of  $\alpha$ -synuclein
- Pathological function of familial Parkinson disease gene LRRK2
- Strategies for development and validation of disease modifying therapies for Alzheimer disease (J-ADNI Clinical Study)



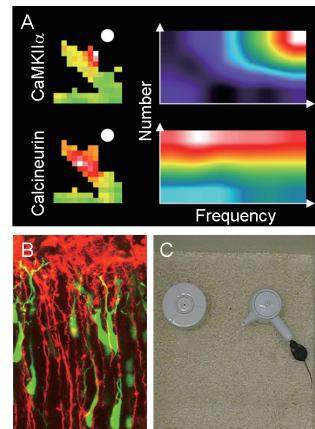
Phosphorylated  $\alpha$ -synuclein deposited in Lewy bodies of Parkinson's disease and Lewy body disease

## Neurochemistry

Our brain is able to recognize and memorize external and internal events as they occur. A functional neural network further stands out by its capacity to extract patterns and rules, and to associate them with abstract meaning and affective valence. What are the local and global spectra of the molecular signaling events in neurons that underlie such complex information processing at the systems level? Are these events, in turn, converted into more profound modifications of the synaptic wiring mechanisms? To address these issues, we are currently investigating the chemistry and physiology of various neuronal protein complexes near and at synapses.

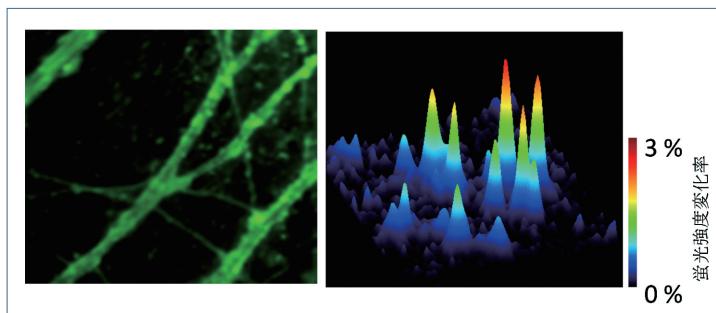
- Molecular investigation (including identification, characterization, optical manipulation and real-time visualization) of signaling molecules involved in activity-dependent modification of synapse, gene expression and neural circuit formation.
- Understanding molecular and circuit mechanisms controlling memory and emotional behaviors, through integration of state-of-the-art *in vitro* and *in vivo* neurobiological techniques in molecular optogenetics/imaging, genetic circuit tracing, and quantitative and behavioral experiments in combination with genetically modified mice and gene transfer using viral vectors.

[http://www.neurochem.m.u-tokyo.ac.jp/  
Homepage.html](http://www.neurochem.m.u-tokyo.ac.jp/Homepage.html)



- A. Single-synapse imaging (left) and frequency-number response profile (right) of CaMKII $\alpha$  and calcineurin  
B. Visualization of migrating neurons (green) and radial glial fibers (red) during corticogenesis  
C. Novel object recognition task

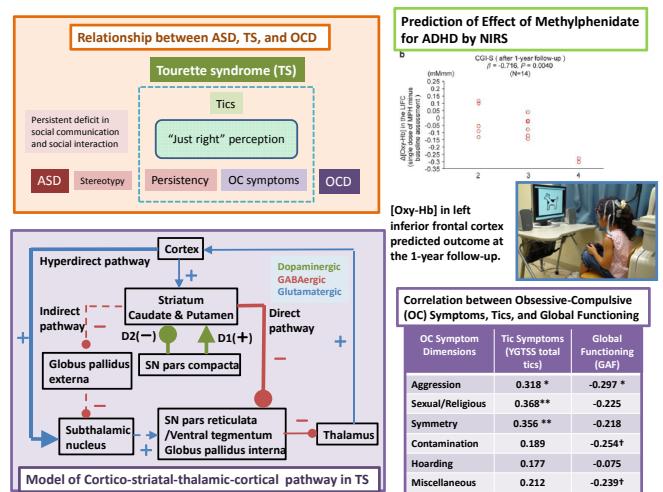
The goal of our research is to elucidate the regulatory mechanisms of physiological functions in the biological systems, especially in the central nervous system, by developing original bioimaging technologies including glutamate imaging technology. Currently, we are developing new basic technologies of molecular tag, super-resolution imaging and  $\text{Ca}^{2+}$  imaging, and applying the technologies to actual physiological studies.



## Child Neuropsychiatry

Main diseases of our current research are autism spectrum disorder (ASD), ADHD, Tourette syndrome and childhood Obsessive-compulsive disorder (OCD). From the viewpoint of development of brain and mind, we are trying to investigate pathogenesis of these diseases by integrating phenomenological, neuropsychological, brain-imaging and genetic studies. We are also applying this integrative approach to treatment research for patients with these diseases.

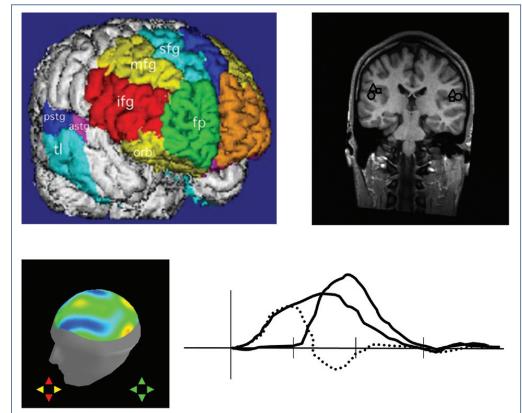
- Behavior phenotype, neuropsychological and genetic study of Tourette syndrome and childhood OCD
- Brain-imaging study of ASD, ADHD and Tourette syndrome structural-MRI, functional-MRI and near-infrared spectroscopy
- Genomic and epigenomic analysis of ASD and Tourette syndrome
- Development of predictor of pharmacotherapy and parent training for ADHD
- Effectiveness study of early intervention for autistic preschoolers and group cognitive behavior therapy for adults with ASD



## Neuropsychiatry

Our department mainly investigates schizophrenia and autistic spectrum disorders not only by biological approaches which integrate neuroimaging, genetic and animal studies, but also by psycho-social approaches. We also promote the systematic clinical research training programs and the cooperation with the basic neuroscience research.

- Integrated Neuroimaging studies in Schizophrenia Targeting Early intervention and Prevention  
<http://plaza.umin.ac.jp/arms-ut/>
- Multimodal neuroimaging studies of autistic spectrum disorders
- Clinical trials to establish the medical equipment as a clinical test useful for the pharmacological treatment of mental disorders



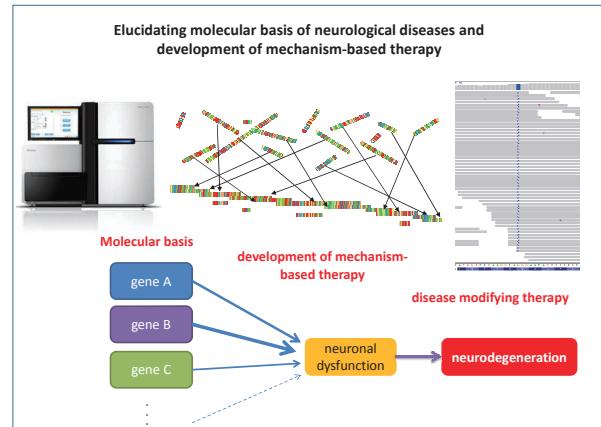
Multi-modality neuroimaging in neuropsychiatry using a combination of high-resolution MRI, EEG, MEG, NIRS, and PET

## Neurology

<http://square.umin.ac.jp/neurotky/>

Our Department is conducting research programs to elucidate the pathophysiological mechanisms of neurological diseases including neurodegenerative diseases, immune-mediated diseases and neuromuscular diseases, and to establish new therapeutic approaches for these diseases. We are also providing excellent training programs to become a board-certified neurologist.

- Molecular Genetics (identification of disease genes and development of therapeutic approaches)
- Molecular pathophysiology of neurological diseases (protein structures and functions)
- Immune-mediated diseases (autoantibodies)
- Neurophysiology and cognitive neuroscience (magnetic stimulation, NIRS, MEG, PET, and fMRI)
- Neuropathology of neuromuscular diseases (pathological studies on biopsy and autopsy materials)
- Multicenter-based clinical research

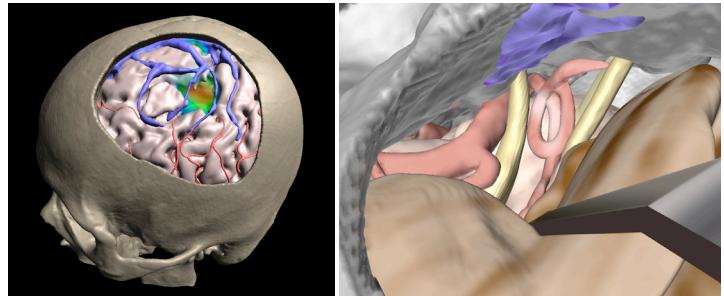


## Neurosurgery

<http://www.h.u-tokyo.ac.jp/neurosurg/>

The 21st century has been designated as "The Century of the Brain". To lead Japanese surgical neuroscience, we have devoted our activities to the following: advanced clinical neurosurgery, neuroscience research and graduate and postgraduate education.

- Skull base surgery in managing benign or malignant skull base tumors and cerebrovascular disorders
- Functional neurosurgery including epilepsy surgery
- Multi-omics analysis of brain tumors (genetic analysis)
- Development of new therapeutic strategies for malignant brain tumors
- Clinical study on gamma-knife surgery
- Application of brain functional imaging for neurosurgery
- Application of VR technology for surgical simulation
- Experiment on cerebral ischemia
- Development of new stenting device for endovascular surgery



Pre-operative simulation using 3D-fusion images



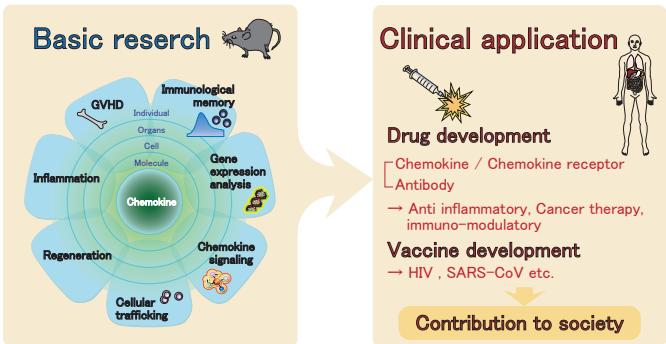
## Social Medicine

### Molecular Preventive Medicine

<http://www.prevent.m.u-tokyo.ac.jp/>

The immune system is maintained by continuous migration of immune cells between lymphoid organs and peripheral tissues. Immune cells change their function during this migration and interact with tissue cells at the periphery. In the context of disease, immune cells induce functional changes, destruction, and remodeling of affected tissues. We aim to clarify how immune cell migration regulates immune function, which may lead to the development of novel therapeutic and preventive strategies toward various diseases.

- Molecular and cellular basis of tissue fibrosis during chronic inflammation
- Pathophysiological regulation of the immune system by chemokines and the implication of this in GVHD, tumor development, infectious diseases, and autoimmunity
- Development of vaccines against cancers and infectious diseases

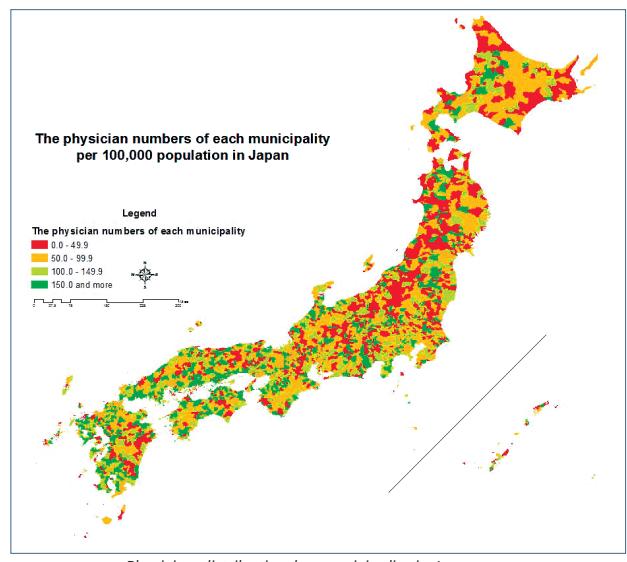


### Public Health

<http://publichealth.m.u-tokyo.ac.jp/>

Public health is the science and art of preventing disease, prolonging life, and promoting health and quality of life (QOL) through organized community effort. Through studies in various fields and laboratories, our department aims to advance research, support policy development, and promote education toward these ends.

- Efficiency and equity issues of health systems
- Health manpower policy
- Occupational and environmental health
- Health services research

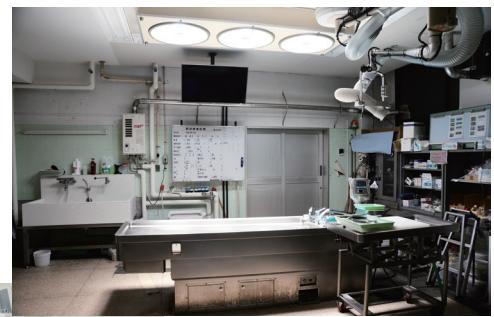


## Forensic Medicine

<http://forensicmed.umin.jp>

We conduct autopsies, and various examinations including histology, biochemistry, radiology, toxicology, and genetics as usual practices. We also perform the following research with other institutes and departments including Education and Research Center of Legal Medicine, Chiba University.

- Analysis and pathophysiology of illegal drugs including new psychoactive substances.
- Application of imaging modalities such as CT, or MRI for death investigation.
- Age and stature estimation and sex determination using CT .
- Mechanical properties of human tissue.
- Diagnosis of drowning.
- Application of relatively new DNA testing method for practice of forensic medicine



Forensic autopsy room



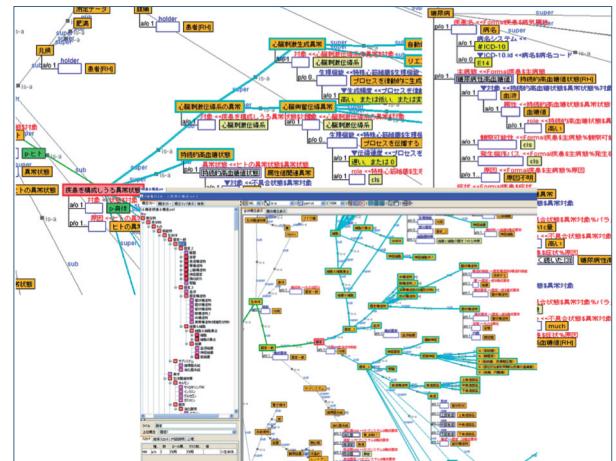
CT room

## Biomedical Informatics

[http://www.m.u-tokyo.ac.jp/medinfo/index\\_e.html](http://www.m.u-tokyo.ac.jp/medinfo/index_e.html)

The role of research and education of this department is provided as the department of the graduate school, and the role of practical management is conducted as the Department of Planning, Information and Management in the University of Tokyo Hospital. All teaching staffs are in charge of both the two roles and the department of health informatics of school of public health. The research and postgraduate education programs cover basic medical informatics, advance applications of information technology for clinical practice, technology assessment and standardization of healthcare information.

- Development and application of clinical ontology
- Research for sharing healthcare data among medical institutions and hospitals, and the application for clinical epidemiology
- Extraction of medical knowledge from electronic medical record database using natural language processing
- Development of knowledge-driven real time alerting system in clinical practice
- Evaluation study of hospital management and analysis of medical resource placement



Development of clinical ontology



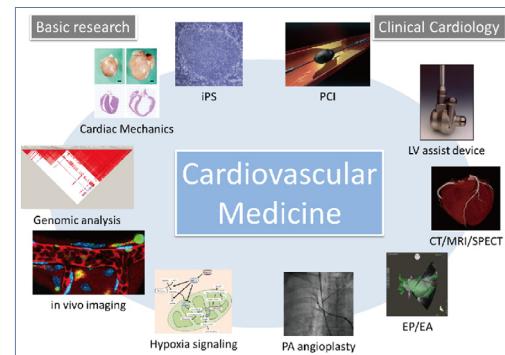
## Internal Medicine

### Cardiovascular Medicine

<https://cardiovasc.m.u-tokyo.ac.jp/>

We aim to provide the finest medical care for all cardiovascular diseases, including ischemic heart disease, arrhythmia, valvular disease, pulmonary hypertension, adult congenital heart disease, and arterial diseases. In particular, we have treated the largest number of serious heart failure patients in Japan. In collaboration with a cardiac surgeon, we would like to work as the last bastion against heart failure. Moreover, with ongoing basic research and translational studies, we are developing new diagnostic modalities and treatments for refractory diseases.

- Investigation of disease pathophysiology (severe heart failure, Marfan's syndrome, pulmonary hypertension, etc.) and development of novel therapies
- Analysis of genome, epigenome, and transcriptomes in various cardiovascular diseases
- Investigation of pathophysiology of cardiomyopathy using iPS cells
- Research on the role of chronic inflammation in the pathogenesis of various cardiovascular diseases
- Research on endothelial dysfunction in various diseases
- Development of new integrated databases for clinical information and research
- Improvement of imaging techniques (echocardiography, MRI, CT, SPECT) for cardiovascular diseases
- Clinical research of severe heart disease, pulmonary hypertension, arrhythmia

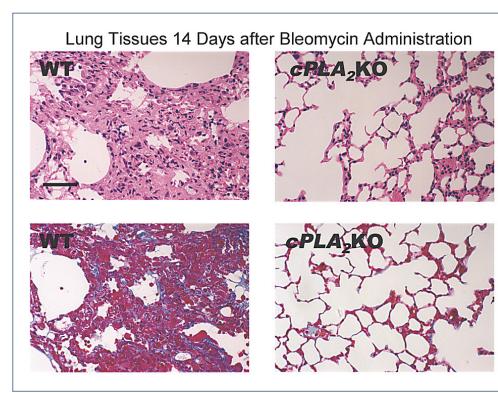


### Respiratory Medicine

<http://kokyuki.umin.jp/>

Based on the fact that a number of patients with respiratory diseases including lung cancer and COPD is tremendously increasing, fruitful results of respiratory research are more and more expected in the 21<sup>st</sup> century. In this era, we are conducting basic and clinical researches for wide variety of respiratory disorders including lung cancer, asthma and COPD. Especially, we have been intensively studying the molecular mechanisms underlying the pathogenesis of lung disorders. Our research goal is to develop novel therapeutic tools to manage these pulmonary diseases.

- Clinical studies of lung cancer, COPD, bronchial asthma and pulmonary fibrosis
- Epidemiological studies of diffuse panbronchiolitis (DPB) and interstitial lung disease
- Molecular mechanisms underlying the pathogenesis of acute lung injury or ARDS
- Molecular mechanisms underlying the pathogenesis of pulmonary fibrosis (as shown in Figure)
- Analysis of disease models using genetically-engineered mice
- Roles of chemokines/cytokines and eicosanoids on airway epithelial cells, smooth muscle cells and fibroblasts.
- Molecular mechanisms of epithelial-mesenchymal transition in lung cancer and inflammatory lung disease
- DNA methylation and lung cancer
- Establishment of conditional vectors for hairpin siRNA knockdowns
- Establishment of CpG island searcher
- Search of a biomarker of lung cancer and inflammatory lung disease



Murine model of pulmonary fibrosis

## Gastroenterology

<http://gastro.m.u-tokyo.ac.jp/med/home.html>

Our Department of Gastroenterology is one of the top institutions in the world in the treatment of hepatocellular carcinoma by unique ablation(RFA) and gastrointestinal/pancreatobiliary cancer/stone by endoscopic manipulation (ESD&ERCP). The goal of our department is to accurately diagnose and give the best available treatment to these patients, and to this end, we are performing a wide variety of basic as well as clinical research.

- Development of better therapeutic strategy for hepatitis B and C
- Elucidation of hepatocarcinogenesis mechanism in viral hepatitis
- Development of a better therapeutic modality for hepatocellular carcinoma & metastatic liver tumor
- Elucidation of gastric injury mechanisms by *Helicobacter pylori*
- Elucidation of stem cell and carcinogenic mechanism of gastrointestinal cancer
- Development of therapeutic strategy for advanced pancreatobiliary cancer
- Development of a better endoscopic therapeutic modality for pancreatobiliary cancer/stone
- Development of better diagnostic & therapeutic strategy for chronic pancreatitis
- Development of an endoscopic *en bloc* resection method for early gastric, esophageal and colonic cancer
- Elucidation of the mechanisms of metabolism-associated liver diseases
- Development of better diagnostic & therapeutic strategy for small intestinal diseases

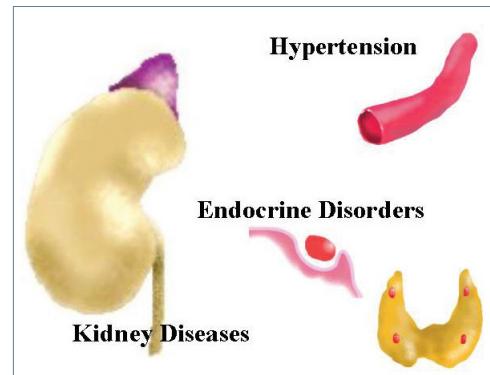


## Nephrology / Endocrinology

<http://www.todai-jinnai.com/>

We are investigating the pathophysiology of renal and endocrine disorders for the development of innovative diagnostic and therapeutic tools.

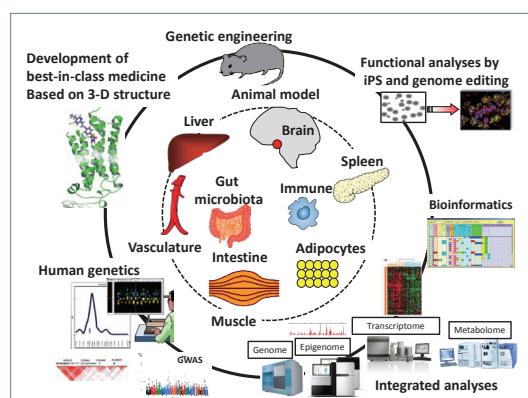
- Analysis of pathophysiology and development of therapy of chronic kidney disease
- Abnormal oxygen metabolism of kidney disease
- Epigenetic changes in CKD
- Development of biomarkers and therapy of acute kidney injury
- Renal physiology and morphology
- G protein signaling in health and disease
- Clinical and basic investigation of bone and mineral disorders
- Pathophysiology of hypertension



## Nutrition and Metabolism

We are investigating to reveal the molecular mechanisms underlying the development of metabolic diseases (diabetes mellitus, lipid metabolic disorders, obesity disease, metabolic syndrome and atherosclerosis) using interdisciplinary approaches and state-of-the-art technology including genetically engineered model animals, iPS cells, omics analyses (epigenome, metabolome etc), human genetics, clinical epidemiology and bioinformatics. Our major goal is to develop mechanism-based fundamental treatment and prevention strategies for the metabolic diseases.

- Elucidation of molecular mechanism of insulin resistance linked to obesity and development of novel treatment focusing on AdipoR
- Epigenetic analysis of the mechanisms of metabolic control and their disruption in type 2 diabetes and obesity
- Elucidation of the molecular mechanism of metabolic diseases and development of novel treatment using iPS cells
- Molecular mechanism of insulin signal transduction
- Molecular mechanism of insulin secretory defect in type 2 diabetes
- Genetic susceptibility and risk factors of type 2 diabetes
- Development of accurate diagnostic algorithm for type 2 diabetes
- Molecular mechanism of adipogenesis and obesity
- Transcriptional regulation of lipid metabolism
- Molecular mechanism of atherosclerosis
- Mouse genetic models of diabetes, lipid metabolism disorder and atherosclerosis



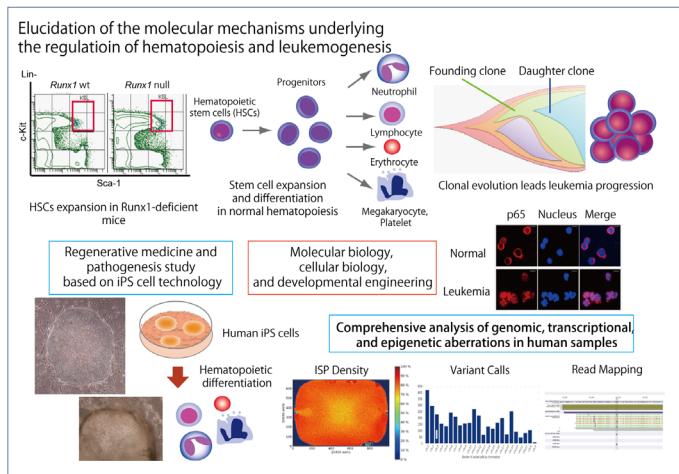
## Hematology and Oncology

<http://www.u-tokyo-hemat.com/>

We investigate the pathogenesis, diagnostic methods, and novel therapeutics of hematological diseases by the comprehensive use of research technologies in molecular biology, cellular biology, developmental engineering, and genomic science. Studies about transcriptional regulation and signal transduction in hematopoiesis and analyses of regulation of hematopoietic stem cells are promoted.

We also implement basic and clinical studies based on genomics, regenerative medicine, and transplantation medicine, which aim at application to therapeutic strategies.

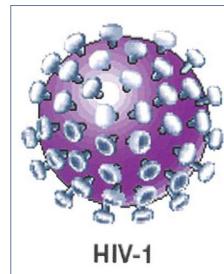
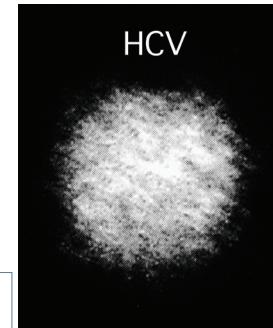
- Mechanisms in the regulation of self renewal and differentiation in hematopoietic stem cells
- Comprehensive genomic and epigenetic analysis of hematological malignancies
- Elucidation of the molecular mechanisms underlying the pathogenesis of leukemia
- Development and analysis of mouse models of leukemogenesis
- Regenerative medicine and pathogenesis study based on human iPS cell technology



## Infectious Diseases

We are investigating both clinical and basic aspects in infectious diseases, in particular, on HIV infection and hepatitis viral infections, the latter of which is the major cause of liver disease worldwide. Our research topics cover the wide areas in microbiology, immunology and pathobiology of infectious diseases, including HIV and HCV infections.

- Clinical studies of HIV infection
- Treatment and prevention of viral hepatitis
- Molecular pathogenesis of hepatocellular carcinoma in HCV infection
- Pathogenesis of extrahepatic manifestations and its control in HCV infection
- Pathogenesis of progression of HIV infection
- Molecular pathogenesis of hepatocellular carcinoma in HBV infection
- Molecular pathogenesis of hepatitis B viral infection
- Host defences to microorganisms
- Molecular analysis of innate immunity in microorganism infection
- Pathogenesis of influenza viral infection
- Mechanism of multi-drug resistant microorganisms

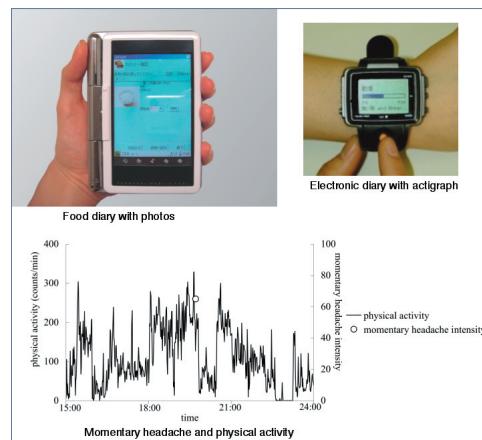


## Stress Sciences and Psychosomatic Medicine

<http://psmut.umin.ac.jp/>

The targets of our laboratory include stress-related diseases such as primary headaches and lifestyle-related diseases, eating disorders and malignancies. The goals of our work are to determine the mechanisms of these conditions, to develop objective markers for diagnosis and severity, and to discover new treatment approaches using ecological momentary assessment (EMA), biochemical assessment of eating-related molecules, and physiological assessment of autonomic nervous function.

- We are using ecological momentary assessment (EMA) techniques to collect and evaluate subjective and objective data including physical activity and autonomic nervous function in natural settings in stress-related diseases. We are also developing new treatments using these methods.
- Investigation into the pathophysiology, psychopathology and neurobehavioral basis of stress-related diseases by use of ecological momentary assessment methods
- Using heart rate and blood pressure variability, we are investigating autonomic nervous function in eating disorders. This work uses non-linear analyses such as fractal analysis, as well as linear analysis.
- We have developed an egogram questionnaire, which we refer to as the TEG.

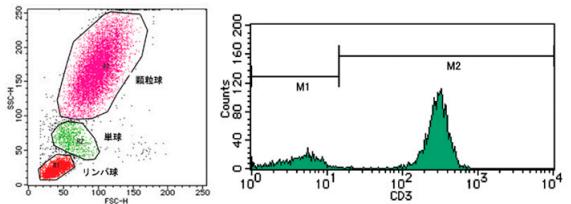
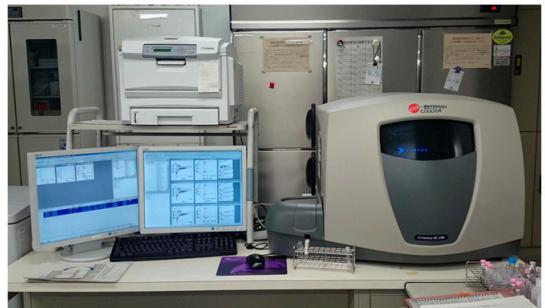


## Clinical Laboratory Medicine

<http://lab-tky.umin.ac.jp/>

The main goal of our research projects, described below, is the development of new and useful laboratory tests, and elucidation of pathophysiology of diseases through laboratory tests.

- (Patho)physiological roles of lysophospholipid mediators, and its application to laboratory medicine
- Platelet biology, Laboratory diagnosis of heparin-induced thrombocytopenia
- Discovery of biomarkers for liver diseases
- Genetic testing
- Clinical introduction of the assay of oxidized/reduced albumin
- Cell surface analysis and quantification of cell surface antigens using flow cytometry
- Analysis of ventricular functions using echocardiography
- Relationship between the respiratory function and various pathophysiological conditions
- Magnetoencephalographic (MEG) study on neural mechanisms for audiovisual integration



Flow cytometer and analysis patterns

## Transfusion Medicine

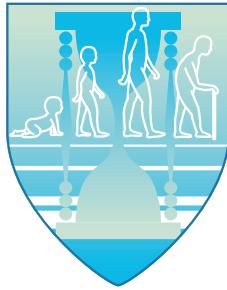
<http://square.umin.ac.jp/traf-tky/>

The Department of Transfusion Medicine aims the achievement of safe and appropriate transfusion practice in the hospital, and for this purpose, controls, tests and supplies all blood products for transfusion.

The research fields include:

- Detection of red cells/ leukocytes/platelets antigens/antibodies
- Development of new anti-angiogenic strategies for the treatment of solid tumors
- Investigation on the pathophysiology of the immunological adverse effects of transfusion
- Clinical study for the safety of autologous blood donation





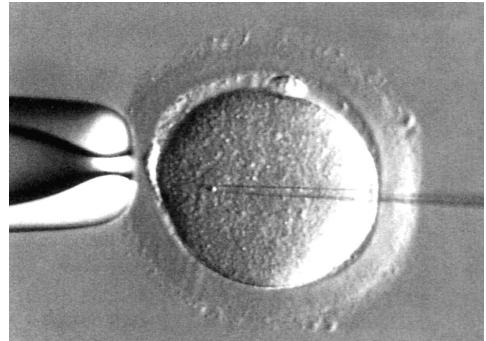
## Reproductive, Developmental and Aging Sciences

### Reproductive Endocrinology

We manage women's reproductive health comprehensively throughout their respective life stages (adolescence, reproductive ages, menopause, and post-menopause). We also aim to develop advanced reproductive techniques, which could be practiced with higher success rates and improved safety, based on experimental and clinical research.

- Establishment of effective and low-risk treatment for infertility
- Development of assisted reproductive technology
- Understanding of interaction between the endometrium and embryo during the implantation period
- Study of pathophysiology of endometriosis
- Understanding of local regulation of folliculogenesis
- Technical development of advanced endoscopic / minimally invasive surgery
- Development of hormone replacement therapy for perimenopausal / postmenopausal women
- Health care for women in perimenopausal / postmenopausal status
- Development of oncofertility

<http://square.umin.ac.jp/tkyobgyn/>



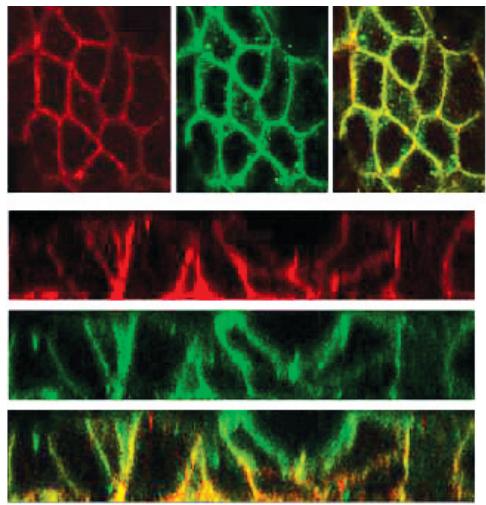
*ICSI (intracytoplasmic sperm injection)*

### Gynecologic Oncology

Our basic research in cervical cancer focuses on carcinogenesis and roles of HPV (Human Papilloma Virus) infection, as well as development of therapeutic vaccines. In endometrial and ovarian cancers, we have identified novel cancer-related genes and their functions, and are exploring novel molecular-targeted therapies using oncogenomic analyses. Clinically, we are investigating intensive surgical management, as well as less invasive (fertility-sparing) surgery in gynecologic malignancies.

- Intensive surgery for advanced or recurrent tumors and less invasive (laparoscopic) surgery for selected patients
- Trachelectomy for early staged cervical cancer patients
- HPV genotyping and clinical trials of therapeutic vaccines for cervical intraepithelial neoplasias
- Identification of molecular-targeted therapies on basis of genomewide analyses
- Development of novel therapeutics using drug delivery system

<http://square.umin.ac.jp/tkyobgyn/>



*Expression of tumor suppressor scribble in malignant cells*

## Perinatal Medicine

<http://www.iiosan.umin.jp/>

The researches are on going for development of precise prenatal diagnosis on the fetal status using ultrasonography and for better understanding on pathology of perinatal diseases. We are also focusing on the immunological aspects and inflammation in patho-physiology of pregnancy. Our goal is to develop the therapy and prevention methods for habitual abortion, pregnancy induced hypertension, preterm labor, and cerebral palsy.

- Prenatal diagnosis of abnormal fetuses using three dimensional ultrasonography
- Management of recurrent pregnancy loss
- Management of complicated pregnancy
- Management of preterm labor
- Prevention of cerebral palsy of the newborn



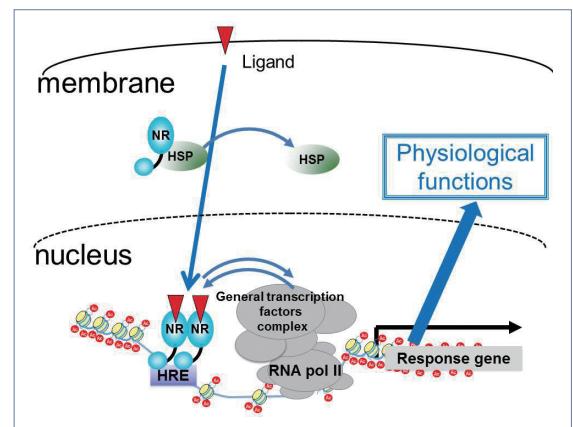
Three dimensional ultrasonography of fetus

## Molecular and Cellular Reproductive Medicine

We investigate the molecular mechanisms of reproductive functions using the knowledge and techniques of molecular and cellular biology and genetics.

Our studies are focusing on the pathophysiological mechanism of sex steroid hormones to elucidate how these hormones effect on reproductive phenomena including embryogenesis, spermatogenesis and fetal development, and on the prenatal genetic diagnosis.

- Effect of sex steroid hormones on reproductive medicine
- Molecular mechanisms of embryogenesis
- Analysis of implantation mechanism
- Analysis of intrauterine fetal development
- Prenatal diagnosis using molecular genetics



Molecular mechanisms of sex steroids

## Pediatrics / Developmental Pediatrics

<http://square.umin.ac.jp/ped/>

We are studying all aspects concerning the health of infants, children and adolescents.

We have achieved very important contributions to clarify the molecular pathogenesis of pediatric disorders.

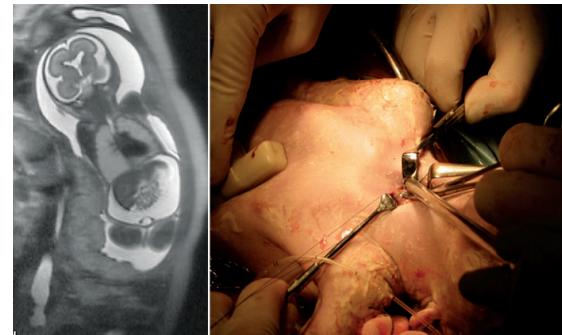
- Molecular diagnosis, analysis and collaborative treatment of pediatric renal diseases
- Molecular diagnosis and analyses of hematological malignancies and solid tumors
- Multi-institutional comparative clinical studies on leukemia and solid tumors
- Molecular analysis and diagnosis and collaborative treatment of endocrine/metabolic diseases and diabetes
- Diagnosis, molecular analysis and collaborative treatment of congenital heart diseases
- Investigation of biotin and gut hormones in neonates
- Comprehensive analysis of biomarkers in neonatal diseases
- Near-infrared spectroscopy analysis of neurological development in early infancy
- Genome-wide epigenetic modification in very low birth weight infants
- Neurocognitive effects of intrauterine infection and environmental toxins
- Diagnosis and comprehensive treatment of neuromuscular disorders
- Molecular diagnosis and treatment of mitochondrial disorders
- Early intervention of developmental disorders
- Molecular analysis and collaborative treatment of congenital immunodeficiency and allergic diseases



## Pediatric Surgery

Pediatric surgical diseases have great variety. In our department all kinds of pediatric surgical conditions are treated, and in these fetal and neonatal surgical care is our main interest. We also treat many pediatric patients using minimally invasive surgeries such as laparoscopy and thoracoscopy.

- Fetal surgery and treatment
- Pediatric minimally invasive surgery
- Pediatric robotic surgery
- Biliary atresia and biliary dilatation: their treatment and long-term prognosis
- The treatment by regenerative medicine of air way malacia and stenosis
- Development of pediatric surgical models
- Association between pediatric surgical diseases and intestinal microbiota
- Assessment of pediatric surgical procedures using nation-wide data

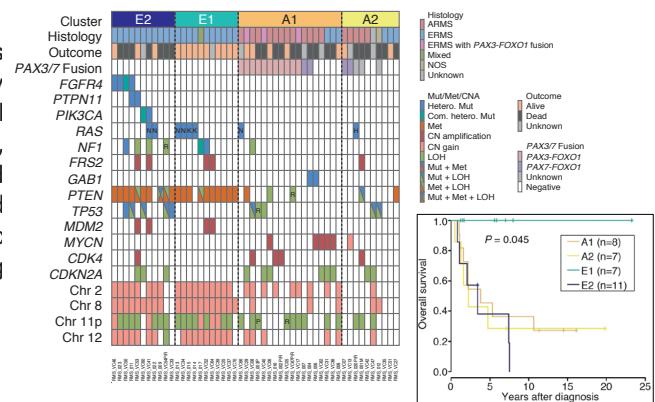


EXIT(ex utero intrapartum treatment):Tracheostomy on a fetus with laryngeal atresia

## Pediatric Oncology

Multidisciplinary treatments and basic research for patients with hematological malignancies and solid tumors are carried out in our department. Advanced medicine including stem cell transplantation is given to patients with leukemia. In addition, appropriate care strategies combining surgical treatment and chemotherapy are decided and carried out on various solid tumors after extremely close discussion with pediatric surgeons. We also implement basic research regarding pathogenesis of pediatric malignancies.

- Genetic analysis and investigations for prognostic factors in neuroblastoma
- Tumorigenesis of germ cell tumors
- Genetic and epigenetic analyses of rhabdomyosarcoma
- Comprehensive genetic analysis of hepatoblastoma
- Studies on pathogenesis and diagnosis of acute lymphoblastic leukemia
- Multi-institutional joint studies on leukemia and solid tumors



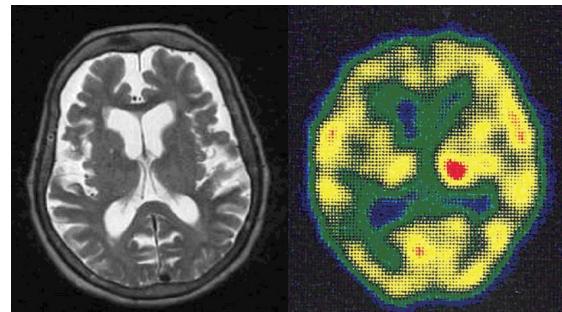
Overview of genetic/epigenetic alterations of rhabdomyosarcoma and survival curves based on the genetic subgroups

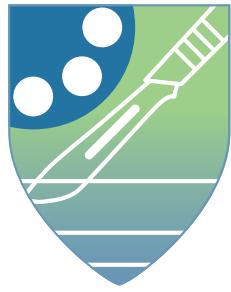
## Geriatric Medicine

<http://www.h.u-tokyo.ac.jp/patient/depts/rounenbyou/index.html>

The department of Geriatric Medicine, established in 1962, is the first department of Geriatric Medicine in Japan. The staff physicians are highly trained and experienced in managing complex cares. Comprehensive cares including assessment and treatment of chronic diseases and geriatric conditions are provided to ensure quality of life and health in elderly patients. Our research interests are as follows:

- Molecular mechanisms of vascular calcification
- Molecular mechanisms of Sarcopenia
- Inhibition of cognitive decline using antihypertensive drugs
- Cares and burden of family caregivers of patients with dementia
- Risk factors for adverse drug events
- Association between sex hormone and geriatric disease
- Novel gene responsible for locomotive syndrome, including osteoporosis
- Molecular mechanisms of vascular injury in sleep apnea syndrome





## Surgical Sciences

### Thoracic Surgery

<http://ctstokyo.umin.ne.jp/>

We specialize in surgical therapeutics, clinical and basic oncology for malignant neoplasms of the chest, such as primary lung cancer, pulmonary metastases, and mediastinal tumors. We also study immunotherapies for patients with postoperative recurrence of lung cancer or those with refractory malignant neoplasms. We started clinical lung transplantation program along with basic research since the University of Tokyo Hospital has become a certified hospital for lung transplantation in March 2014.

- Surgical therapeutics for malignant neoplasms of the chest
- Clinical and basic oncology of lung cancer
- Clinical and biological studies on thymic neoplasms
- Immunotherapy for lung neoplasms
- Clinical and basic studies on lung transplantation

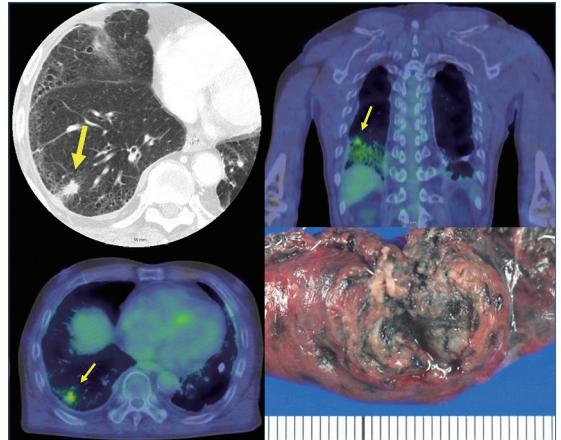


Figure: A case of lung cancer with interstitial pneumonia.  
(left upper) High-resolution Computed Tomography  
(left lower) Axial section of 18F-FDG-PET  
(right upper) Frontal section of 18F-FDG-PET  
(right lower) resected specimen

### Cardiovascular Surgery

<http://ctstokyo.umin.ne.jp/>

We are leading in Japan by annual surgery case volume of 400. New knowledge and techniques are actively applied clinically. Many clinical research projects are going on along with routine clinical activities. Our laboratories have been also carrying out a large variety of basic research.

- Clinical research
  - Improvement of long-term results of heart transplantation
  - ventricular assist device for end-stage heart failure
  - valve plasty and valve-sparing operation
  - Treatment of complex congenital heart disease
- Basic and experimental research
  - Development of new control system for ventricular assist device
  - Development of myocardial regenerative therapy
  - Development of a new suture device under endoscopic environment



Ventricular assist devices clinically available in Japan

## Gastrointestinal Surgery

<http://toda3ge.umin.jp/>

Our goal is to cure the cancer patients by much better surgery. The development of better surgical methods has the highest priority. Better surgery means radicality of the cancer, minimal invasiveness, and good QOL after surgery. Recently, non-transthoracic radical esophagectomy with extended lymphadenectomy (NOVEL) has been applied, which shows less pulmonary complications and good respiratory functions after surgery (Figure).

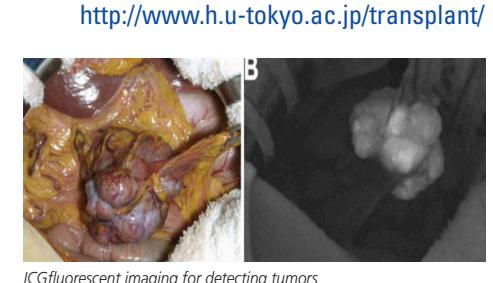
- For much better surgery
  - Robot assisted non-transthoracic esophageal cancer surgery
  - Non-exposed Endoscopic Wall-inversion Surgery for gastric tumor (NEWS)
  - laparoscopic gastrectomy, mediastinoscopic and laparoscopic assisted esophagectomy
- For radicality of advanced cancer treatment
  - S-1/CDDP/Herceptin combined chemotherapy for HER2-positive unresectable gastric cancer
  - Chemo-immunotherapy for advanced esophageal cancer (DCF+γδT)
- Research for carcinogenesis, progression, diagnosis and treatment
  - Inflammation and gastrointestinal carcinogenesis
  - Activatable fluorescence imaging probe for esophageal and gastric cancer
  - Oncolytic viral therapy for esophageal cancer
  - Genetics and epigenetics for esophageal and gastric cancer
  - Early detection of gastrointestinal cancer by new biomarkers



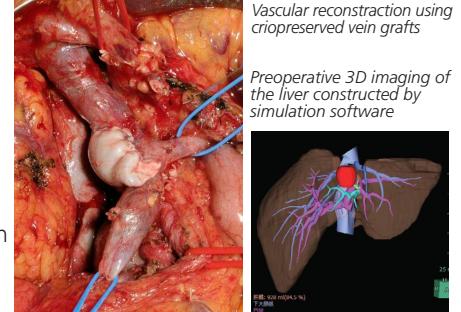
## Hepatobiliary Pancreatic Surgery

We constantly perform nearly 200 hepatectomies every year on patients with hepatobiliary malignancies including hepatocellular carcinoma and metastatic liver tumors. The surgical results can be classified as amongst the highest ranking in the world. In order to improve the surgical outcome for hepato-biliary-pancreatic malignancies, we conduct wide areas of research such as analysis of prognostic factors for liver malignancies, evaluation of liver hemodynamics using ultrasonography, liver ischemia/reperfusion injury, and liver regeneration.

- The analysis of genetic abnormalities in hepatocellular carcinoma
- Development of new methods for the evaluation of liver functional reserve
- The evaluation of hemodynamics in the congested liver using ultrasonography
- Navigation system during liver surgery
- Study of intraoperative diagnosis (contrast-enhanced ultrasound, ICG fluorescent imaging, and elastography)
- Study of intraoperative diagnosis (enhanced ultrasound and ICG fluorescent imaging)
- Clinical trials concerning perioperative chemotherapy in hepatic resection for colorectal liver metastasis
- RCT to evaluate the effects of surgical resection and RFA for HCC (SURF trial) Investigation of adjuvant immunotherapies after surgery for pancreateo-biliary malignant tumors
- Vascular reconstruction using criopreserved vein grafts Evaluation of the anti-adhesion materials



ICGfluorescent imaging for detecting tumors



Vascular reconstruction using criopreserved vein grafts  
Preoperative 3D imaging of the liver constructed by simulation software

## Urology

We constantly perform more than 1,200 urological surgeries every year, including nephrectomy, cystectomy and prostatectomy, with increasing trend of laparoscopic maneuvers. Robotic surgery was introduced in 2011. Surgical or non-surgical means are employed for non-cancer disease including chronic renal failure, urinary dysfunction, urinary incontinence and interstitial cystitis. With regard to basic research and treatment, genome analysis, dendritic cell therapy, viral therapy and Botulinum toxin injection are now under extensive investigation.

- Genome analysis of Corticotropin-independent Cushing's syndrome (Fig.1)
- Virus therapy for prostate cancer
- Genome analysis of renal cancer, renal pelvic cancer, ureteral cancer and testicular cancer
- Bladder cancer therapy with a vaccine against NY antibody
- Dendritic cell therapy for metastatic renal cancer and bladder cancer
- Botulinum toxin injection therapy for interstitial cystitis
- Artificial urinary sphincter for male urinary incontinence
- Robot-assisted laparoscopic radical prostatectomy
- Robot-assisted laparoscopic partial nephrectomy
- Robot-assisted laparoscopic radical cystectomy

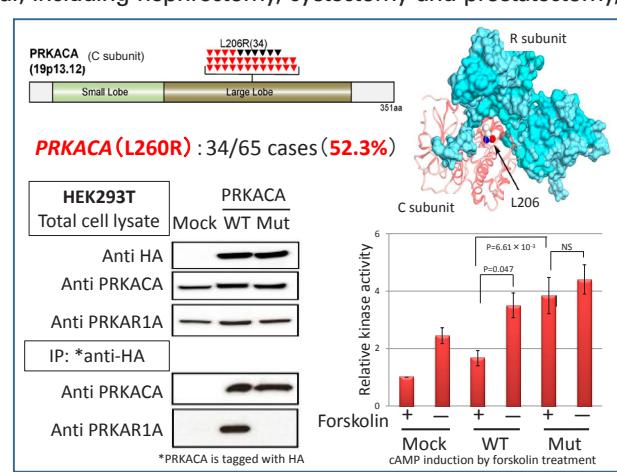
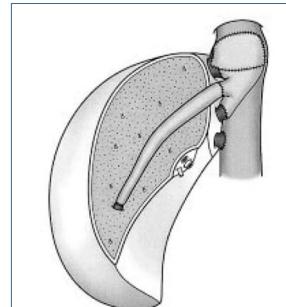


Fig.1 The L206R mutation in PRKACA, which was found in >50% of Corticotropin-independent Cushing's syndrome, has cAMP-independent activation of cAMP-dependent protein kinase (protein kinase A).

## Artificial Organ and Transplantation Division

570 living donor liver transplantation and 25 deceased donor liver transplantation until Dec. 2016. The 5-year survival rate for adult case was 85%, which is significantly superior to that of the national data (73%).

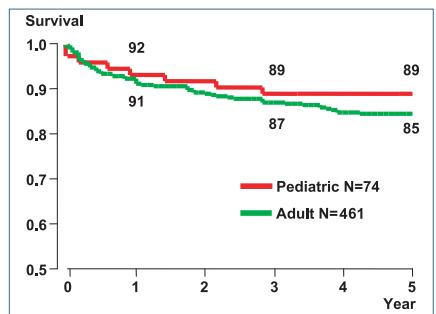
- Surgical technique of liver transplantation: including right lateral sector graft, APOLT(Auxillary partial orthotopic liver transplantation)
- Hepatic vein reconstruction using criopreserved vein grafts
- Identification of veno-occlusive lesions using ICG fluorescence imaging
- Antiviral treatment for hepatitis C virus infection after liver transplantation
- Validity and feasibility of transient elastography for the transplanted liver
- New-onset diabetes mellitus developing in adult living donor liver transplant recipient
- Diagnosis and treatment for acute rejection
- Diagnosis and treatment for postoperative infection



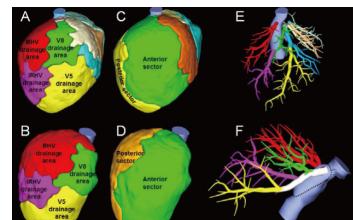
Hepatic vein reconstruction using criopreserved vein grafts

3D images of the liver graft by liver simulation software

<http://www.h.u-tokyo.ac.jp/transplant/>



Overall survivals after living donor liver transplantation

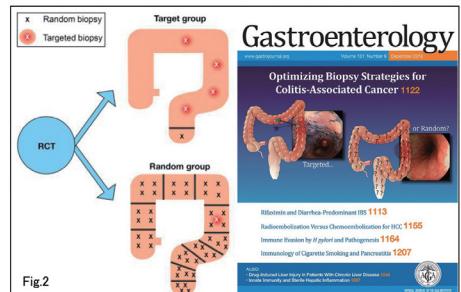
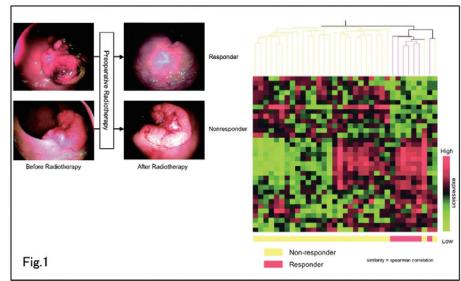


## Surgical Oncology

We have performed basic and clinical research mainly on colorectal cancer and inflammatory bowel disease. In basic research, we are studying biological phenomenon from various point of view such as carcinogenesis, cancer metastasis, and immunology. In clinical study, we are trying to identify the best way to treat each patient with the least surgical stress by minimally invasive surgery such as laparoscopic surgery and robotic surgery (da Vinci), and preoperative chemoradiation therapy for rectal cancer.

- Robot assisted surgery (da Vinci robotic surgery)
- Radiosensitivity and chemosensitivity of cancer
- Characterization of tumor vasculature and its therapeutic application
- Surveillance of ulcerative colitis
- Carcinogenesis in ulcerative colitis
- Cancer and autophagy
- Development of chemoradioimmunotherapy
- Genetic analysis of poorly differentiated colorectal cancer
- Intraperitoneal chemotherapy for peritoneal carcinomatosis

Fig.1 Prediction of chemoradiosensitivity in rectal cancer by DNA microarray

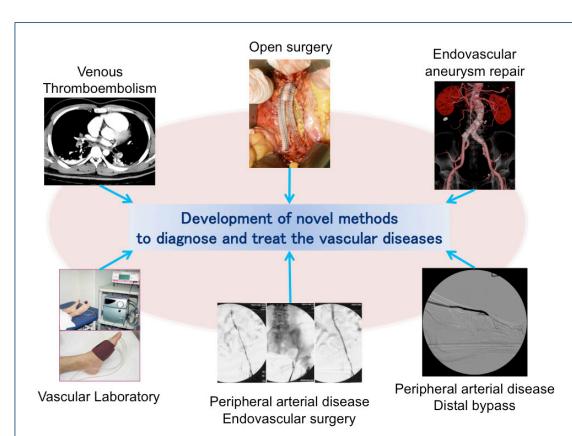


## Vascular Surgery

We have a great deal of experience in treating patients with various vascular diseases, and we have performed much research on atherosclerosis, angiogenesis and vascular regeneration. Based on the research results, we are trying to identify the best way to treat each patient with the least surgical stress.

Development of a novel method to diagnose and treat the vascular diseases.

- Vascular regeneration therapy for atherosclerotic obliterans
- Development of aortic aneurysm model and simulation
- Gene analysis of peripheral arterial disease
- Visualization of the atherosclerotic lesions with fluorescent probe
- Navigation system for less invasive vascular surgery
- Analysis of intermittent claudication with dynamic and mechanical model
- Dynamic and genetic mechanism of aortic aneurysm expansion
- Development of the new prosthesis with small diameter
- Hemodynamic analysis of aortic wall after endovascular aneurysm repair
- Drug delivery system for aortic aneurysm and peripheral arterial disease



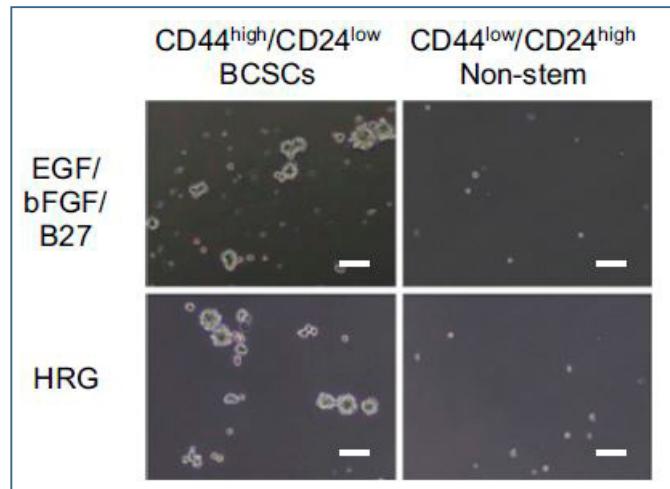
<http://all-1su.umin.jp/>

## Breast and Endocrine Surgery

<http://toda3ge.umin.jp/>

The department of breast and endocrine surgery in Tokyo University Hospital provides surgical treatment for approximately 250 patients with breast cancer, thyroid cancer, benign thyroid tumor or parathyroid adenoma every year. Our research activities focus mainly on breast cancer and thyroid cancer.

- Genetic analysis of breast cancer stem cells
- Improvement of QOL in cancer patients with cosmetic camouflage
- Introduction of High Intensity Focused Ultrasound into clinical use
- Clinical impact of Eribulin on metastatic breast cancer

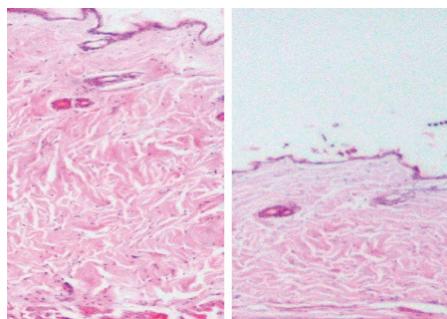


## Dermatology

<http://www.h.u-tokyo.ac.jp/der/>

Our department actively performs the following cutting-edge, multifaceted research projects that will be put into clinical practice in the future.

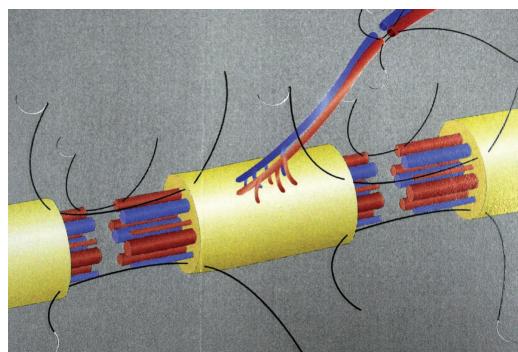
- Molecular mechanisms of immunological abnormalities and skin and lung fibrosis in scleroderma
- Development of novel therapies to scleroderma, including B cell depletion therapy
- Relative contribution of various cell adhesion molecules and chemokines to inflammatory conditions
- Identification of novel autoantibodies and their clinical significance in connective tissue diseases
- New roles of B lymphocytes, especially regulatory roles, in inflammatory disorders
- Immunological abnormalities of atopic dermatitis
- Pivotal roles of Fli1 in systemic sclerosis
- Roles of chemokines in cutaneous lymphoma



## Plastic and Reconstructive Surgery

In our lab, we are investigating the mechanisms of morphogenesis of congenital anomalies using a developmental biological approach. In addition, we are performing extensive research into the clinical application of engineered tissues such as skin, soft tissue, and cartilage. We also have several cosmesis-related projects such as clinical hair regrowth with cultured cells and analysis of skin aging mechanisms.

- Basic Research
  - Mesenchymal stem cells derived from lipoaspirates
  - Organ engineering with human adult stem cells
  - Hair regrowth with cultured dermal papilla cells
  - Research on aging skin-related factors
  - Regulation of skin aging using hormones and retinoids
  - Regulation of epidermis by factors derived from dermal fibroblasts
- Clinical Research
  - Ultramicrosurgical reconstruction using vascularized tissue transfers
  - Reconstructions for established nerve palsy
  - Mechanism and surgical treatments of lymphedema
  - Free vascularized transfers of nerve cells, muscle cells, adipose cells, and lymph nodes
  - Allogenic tissue transfer (uterus, ovary, anus etc.)
  - Esthetic microneurovascular surgery
  - Vascularized ovarian preservation and transplantation
  - Training method for supermicrosurgical anastomosis

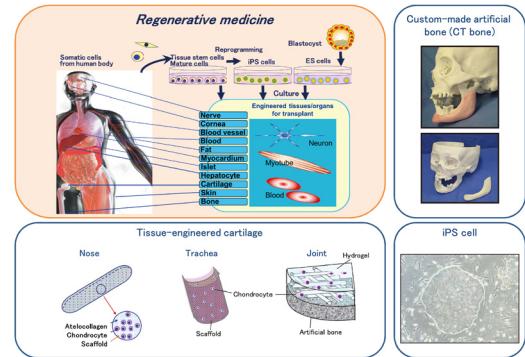


## Oral and Maxillofacial Surgery

<http://plaza.umin.ac.jp/~oralsurg/>

Our laboratory has been performing a wide range of clinically oriented research in oral-maxillofacial disorders such as congenital diseases, jaw deformities and tumors in the oral region. Cartilage and bone regeneration using tissue engineering techniques is our main field of research.

- Clinical research:
  - Treatment of facial deformities and malocclusion in patients with cleft lip/palate
  - Research on facial growth in patients with craniofacial anomalies
  - Reconstruction of oral and maxillofacial area by custom-made artificial bone (CT bone) (clinical trial)
  - Transplantation of implant-type tissue-engineered cartilage for cleft lip-nose patients (clinical study)
  - Management of occlusion in patients with fibrodysplasia ossificans progressiva (FOP)
  - QOL study of oral health care system in preoperative cancer patients
  - Clinical study of antifungal susceptibility in patients with oral candidiasis
- Basic and experimental research:
  - Regeneration of bone and cartilage with tissue-engineering approach
  - Development of intelligent artificial bone with the ability of bone induction
  - Development of micro-tetrapod bone implant
  - Molecular biology of cartilage repair and its application to cartilage regenerative medicine
  - Cartilage regenerative medicine using iPS cells
  - Development of novel scaffolds for cartilage and bone regeneration
  - In vivo evaluation of tissue-engineered cartilage and bone
  - Study on the control of mesenchymal cell differentiation
  - Elucidation of epigenetic abnormalities in oral cancers and oral premalignant lesions
  - Elucidation of sphingosine-1-phosphate signaling and its role in multistage oral cancer
  - Functional analysis of microRNAs in human dental pulp stem cells

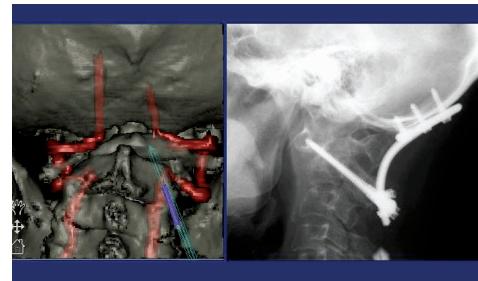


## Orthopaedic Surgery

<http://www.u-tokyo-ortho.jp/>

Our department was established in 1906 as the first department of orthopaedic surgery in Japan. Since then our efforts have been dedicated to responding to the needs of patients for orthopaedic care and to related research. Our department seeks to elucidate the molecular and genetic backgrounds of bone and cartilage disorders in order to develop groundbreaking treatments for these conditions. At the same time, we are attempting to establish various clinical devices.

- Systemic and comprehensive study for osteoarthritis
- Bone, cartilage and nerve regeneration
- Regulation of anabolic and catabolic bone metabolism by cytokines
- Molecular mechanism of age-related bone loss
- Molecular mechanism of osteoclast differentiation and apoptosis (RANKL-RANK, INF, Src)
- Gene therapy to control pathological bone destruction (arthritic bone resorption and arthritic joint destruction) using adenovirus vectors
- Surgical navigation system with a three-dimensional display and navigation robot
- Long-life artificial joint by construction of a super-durable lubricious interface of MPC



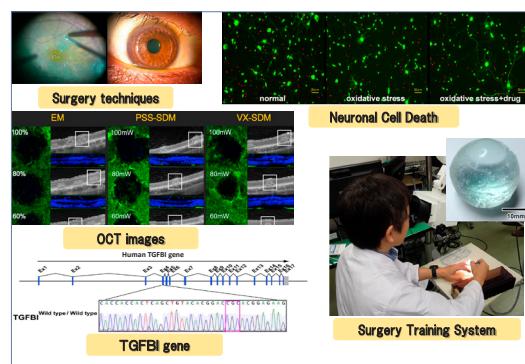
Surgical navigation system

## Ophthalmology

<http://plaza.umin.ac.jp/oph/>

Our department applies cutting-edge technologies and knowledge to diagnosis and treatment of eye diseases. We conduct basic researches involving multi-faculties with molecular biological, immunological, and pharmacological techniques, and clinical studies with epidemiology and biostatistics.

- Development and evaluation of new drug therapies and surgical techniques on glaucoma, or retinal, corneal, and uveal diseases.
- Development of diagnosis and treatment in glaucoma with functional and structural analysis.
- Study on mechanisms for maintaining intraocular pressure, and development of new drugs using clinical samples of glaucoma eyes and genetically modified animals.
- Further research in the mechanisms of neuronal death in retinal neurons and glial cells, and exploration of useful neuroprotective agents.
- Development and application of surgery training systems with bionic eyes.
- Improvements in corneal regeneration therapy and development of new therapies in hereditary corneal diseases.
- Study on corneal mechanisms to maintain clarity.
- Research on refractory uveitis and intraocular lymphoma.
- Comprehensive studies on multimodal imaging of structures and functions of macular diseases.



## Otolaryngology and Head and Neck Surgery

<http://www.h.u-tokyo.ac.jp/orl/>

Our research is composed of both clinical and basic research. Clinical research is conducted by specialized clinics in the hospital, which experience ear diseases and hearing disorders from neonates to adulthood, head and neck cancer, paranasal diseases, olfactory and disorders, vertigo and balance disorders and voice and swallowing disorders. Basic and experimental research into molecular biology, electrophysiology and morphology is conducted in our department's laboratories.

- Clinical research
- Cochlear implantation in deaf children and their development of hearing, speech and language
- Surgical correction of congenital microtia and atresia and postoperative radical ears to improve hearing
- Quality of life in patients with head and neck cancer to restore speech and swallowing function
- Vestibular research on the oculomotor and balance system and myogenic potential
- Vestibular rehabilitation by electric stimulation
- Navigation of the paranasal sinuses and skull base surgery
- Surgical treatment of voice and swallowing disorders
- Basic and experimental research
- Molecular biology of the inner ear
- Molecular biology of pharyngeal cancer
- Molecular biology of differentiation and development of inner ear and olfactory epithelium
- Origins of vestibular myogenic potential
- Aging and regeneration of olfactory epithelium
- Physiology of vocal cord vibration

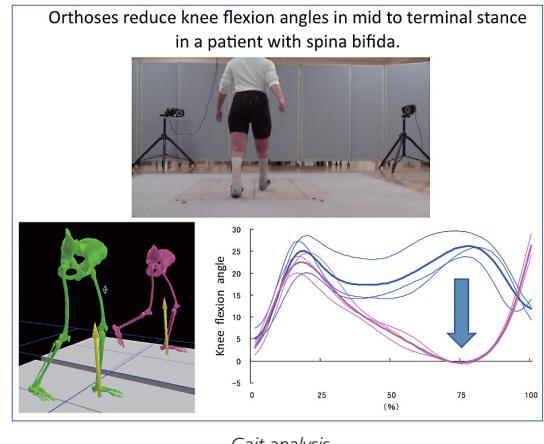


Cochlear implant

## Rehabilitation Medicine

Our research purpose is to improve the provision of a unique and comprehensive rehabilitation service enabling people to develop their full potential and often returning from being a "patient" to being a "person". Clinically oriented studies concentrate on elucidation of the origin of disabilities to cause activity limitation and restriction of participation.

- Gait analysis
  - 3-dimensional image analysis with a infrared camera system
  - Measurements of 3 dimensional ground reaction forces with a force platform
  - Measurements of foot pressures with a computerised pressure sensor
- Clinical research on intractable rare diseases
  - Fibrodysplasia Ossificans Progressiva
  - Congenital Insensitivity to Pain
- Clinical research on congenital limb malformations
- Research on the effect of robotic rehabilitation

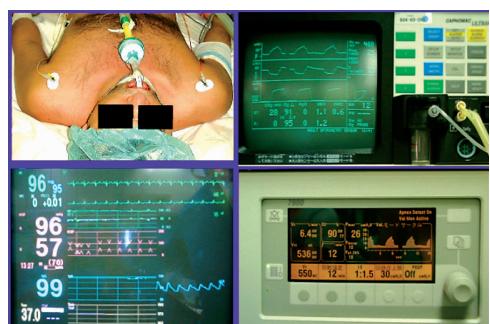


## Anesthesiology

<http://www.anes.umin.ne.jp/>

We have seven research groups and their fields include respiration, circulation, pain, immune system and shock.  
These are recent major subjects of our research.

- Respiratory system: A role of cytokine signaling in acute lung injury; Exploring optimal ventilatory strategy for respiratory failure
- Immune systems: Modification of immune system by anesthesia; Signal transduction pathway related to apoptosis induced by sepsis or ischemia-reperfusion injury
- Shock: Investigation of pathophysiology of shock; Effect of new plasma substitutes on hemorrhagic shock.
- Inflammation: A role of lipid mediators in organ damage mediated by ischemia-reperfusion injury of a mouse lower limb.
- Pain: A role of lipid mediators in the formation of hyperalgesia; A role of spinal microglial cells in the development of inflammation-mediated neuropathic pain; Mechanism of pruritoceptive and neurogenic Itch; Cognitive-behavioral therapy on chronic pain.
- Nervous system: Analysis of electroencephalography during general anesthesia; Clinical evaluation of neurological sequelae after cardiac surgery; Evaluation of neuroprotective properties of anesthetics.
- Anesthesia apparatus and other medical equipment: Invention and validation of a new airway device.
- Glucose metabolism: Effect of anesthetics on glucose metabolism *in vivo*
- Epidemiological survey and outcome study with large administrative database.

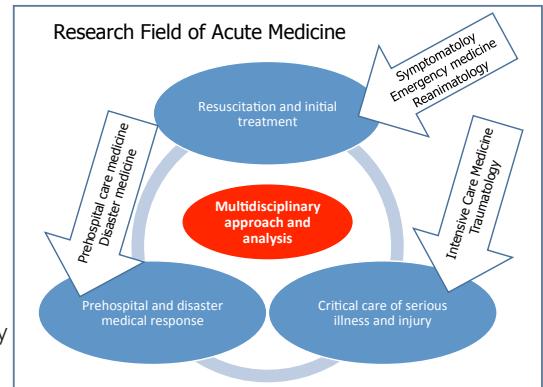


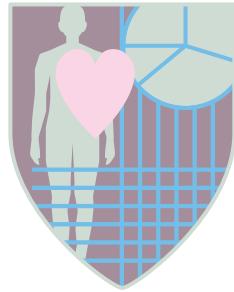
## Acute Medicine

<http://plaza.umin.ac.jp/todaiqq>

We, acute care physicians, have a role to treat the patients with sudden and unexpected illness and injury, and our specialties are very wide in the settings of prehospital, disaster, ER (emergency room), and critical care. Acute Medicine is the science of these fields. Main studies of our department are as follows.

- Acuity of injury and illness related studies
  - Establishment of conception of "definitive acuity"
  - Acuity and severity scoring system
- Methodology of task switching in the setting of multitask at ER
- Improvement of outcome of emergency patients by mobile on-site physicians team
- Performance indicators of medical control for paramedics
- Performance indicators of regional emergency medical service system
- Critical care related studies
  - Relationship between biomarkers and severity of critically ill
  - Non invasive monitoring technology to predict circulatory shock status
- Versatile and durable WEB-based information sharing system for emergency medical service system and disaster medical response.
- Mass casualty incident and natural disaster medical response related studies
  - Investigation of regional disaster medical risk-resource-ratio (static approach)
  - Dynamic simulation model of necessity of regional medical resource in MCI and large scale natural disaster





## Health Sciences and Nursing

### Mental Health / Psychiatric Nursing

Our departments conduct research on mental health and psycho-social stress and provide education/ training of professionals in related fields from global perspectives.

- Mental Health
  - Mental health epidemiology
  - Occupational mental health/Occupational health psychology
  - Psychoeducation/Stress management
  - Disaster and mental health
  - Global mental health
- Psychiatric Nursing
  - Supporting people living with mental health problems
  - Wellness self-management in mental health
  - Recovery for people with mental illness
  - Peer support

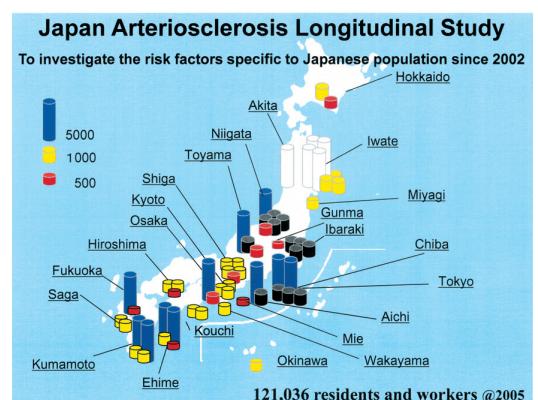


### Biostatistics / Epidemiology and Preventive Health Sciences

We are working on methodological researches of biostatistics and theoretical epidemiology, as well as consulting and supporting the conduct of epidemiologic/clinical studies. The followings are our important missions: biostatistical education for undergraduate and graduate students; the support of planning and analysis for clinical trials conducted in the University of Tokyo Hospital Clinical Research Support Center; and the support of resource development for academic biostatisticians.

- Methodology
  - Design and analysis of clinical trials/epidemiologic studies
  - Causal inference, missing data analysis and measurement error models
  - Meta-analysis (eg. evaluation of surrogate endpoints)
- Collaborative projects
  - Japan Arteriosclerosis Longitudinal Study (JALS)
  - Chronic Kidney Disease Japan Cohort (CKD-JAC) Study
  - National Surgical Adjuvant Study of Breast Cancer (N-SAS-BC)

<http://www.epistat.m.u-tokyo.ac.jp/>



## Nursing Administration / Advanced Clinical Nursing

<http://nurs-adm.umin.jp/>

Our department is aiming to propose a new practical model or system that creates "well-being" of all the stakeholders, including patients, health care providers, related institutions, and society. To this purpose, we are studying organizational processes; work environment and tools that nurses are surrounded with; the policies; and these relationships with outcomes and efficiency; and studying approaches to drawing out potential of nurses and that of their organizations.



- mission management
- diversity management
- leadership
- organizational development
- shared values
- communication in work place
- career development
- professionalism
- developing new technology for foot care

## Family Nursing

Hand-in-hand with the seismic social changes occurring nationally and worldwide -- including declining birthrates and a growing proportion of elderly people, vulnerability of regional networks, and movement toward a gender-equal society -- the form and function of the family unit are also changing. Current Japanese society expects not only a client-centered perspective, but also a perspective of the family as 'client' in nursing research. Within this context, our research focuses especially on child-rearing issues and on caring for children with illness.

- Postnatal depression, difficulties in child rearing, child abuse and neglect
- Development of Pediatric QOL Inventory for children with chronic illness and their parents
- Transitional care for children, adolescent and young adult with childhood-onset chronic diseases and their families
- Support for survivors of childhood cancer including caring of their late effects, special needs education, school reentry and working
- Role and expertise of nursing staff in daycare centers
- Burden borne by caregivers of children with medical complexity, and their utilization of respite care services
- Care for dying patients and their families (QOL, family function)

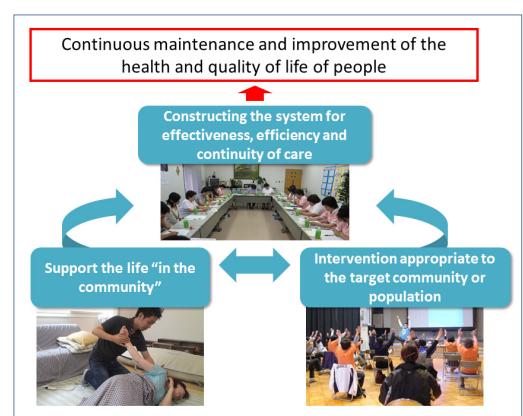


## Community Health Nursing

The goal of our department is to continuously maintain and improve the health and quality of life of people regardless of their life stages and health statuses, by taking advantage of the characteristics of a target community or population and constructing the system. Also, we cover the research on skills of public health nurses who are the provider of community health care.

- Construction of community health care system
- Community health care for maternal and child health/ mental health/ elderly's health
- Community health nursing for disaster prevention and recovery
- Skills of public health nurses

<http://park.itc.u-tokyo.ac.jp/chn/english/index.html>



Research of community health nursing

# Gerontological Home Care and Long-term Care Nursing/ Palliative Care Nursing

<http://www.adng.m.u-tokyo.ac.jp>

Our research activities are targeted at quality assurance/improvement of long-term nursing care for clients and their family members. We also aim at advancing knowledge grounded at nursing activities in Japan. 1) Developing theoretical frameworks that guide nursing care by explaining the nature of illness/aging experience and experience of taking care of others. 2) Developing quality improvement systems for nursing/healthcare in hospitals, long-term care facilities, outpatients, and home care.

- Quality assurance/improvement of care in the long-term care system
- Development of clinically derived theories through case studies and phenomenological approach
- Development of a community care system and nursing role
- Evaluation of outpatient nursing care for cancer patients (e.g., those undergoing hematopoietic stem cell transplantation)
- Development of quality indicators for gerontological homecare nursing
- Development of IT-based nursing care/educational programs



Hosted a symposium at the East Asian Forum of Nursing Scholars

## Midwifery and Women's Health

<http://midwifery.m.u-tokyo.ac.jp/en/>

The physical and mental changes that occur during the perinatal period have a critical influence on women's health for their entire lives, including their child-rearing years, menopause, and old age. In addition, the influence extends to their children, families, and the community. Our department specifically focuses on the health of mothers and babies in the perinatal period, and mainly performs research in the following areas.

- Lifestyle
  - Effects of exercise (yoga) and daily activities during pregnancy on the physical and mental well-being of the mother
  - Development of an intervention methodology for improving dietary nutrition status during pregnancy and postpartum
  - Health support for working women in the prenatal and child-rearing periods
  - Harmful effect of second-hand smoking during pregnancy in Mongolia
- Mental health
  - Effects of fear of childbirth on the physical and mental well-being of prenatal and postnatal women
  - The factors that affect post-traumatic stress disorder syndrome among postnatal women
- Perinatal health issues
  - Physical and mental conditions of the pregnant women with intimate partner violence
  - Prevalence of dysfunction of the pelvic floor muscles in the postpartum period and identification of the risk factors
  - Effect of skin care on the skin barrier function in infants
  - Cause and risk factor of maternal mortality, and evidence-based humanized childbirth in El Salvador



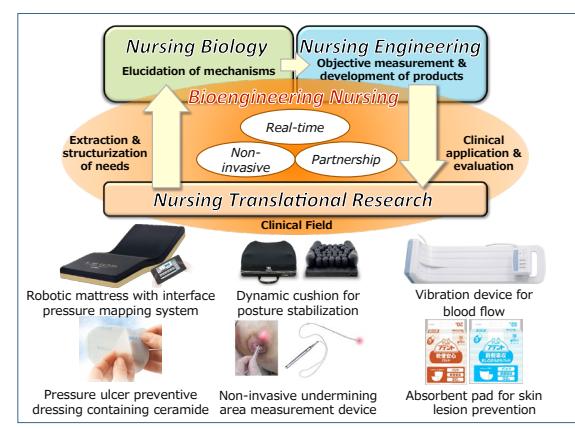
Drawing / Shoichi Sakamoto

## Gerontological Nursing / Wound Care Management

<http://www.rounenkango.m.u-tokyo.ac.jp/index-e.html>

Pressure ulcers and diabetic foot ulcers usually occur in elderly people due to basic activities of daily living such as walking, sleeping, diet and excretion. Thus their supports are inevitable for comprehensive wound care management. Especially, diabetes mellitus, nutrition, and skin care are of importance for wound healing, hence we account for these keys to develop wound care technologies and devices. Our department address the new concept of nursing science, "Bioengineering Nursing", in which the basic science will be translated into clinical science through co-development of new technologies and devices with specialized engineers.

- Development and evaluation of wound management technology and devices
  - Elucidation of pathophysiology and its diagnosis technology of wound
  - Development of technology and devices for wound management and prevention
  - Evaluation of new technology and devices
  - Investigation of bioengineering aspect of elderly skin
  - Exploring of objective parameter of skin status
  - Development of intervention methodology for improving skin function



Products developed through bioengineering nursing research model

## **Health Sciences and Nursing**

**Health Sociology** See **Health and Social Behavior**(p50)

**Health Education** See **Health and Social Behavior**(p50)

**Biomedical Ethics** See **Biomedical Ethics**(p51)



## International Health

### Global Health Policy

<http://www.ghp.m.u-tokyo.ac.jp>

Our mission is to improve population health by enhancing accountability and improving the evidence base of global (both domestic and international) health programs through the provision of the best possible information and rigorous monitoring and evaluation. The department's members generate knowledge and ideas through their research with high social and academic impacts, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in the developing world.

The priority areas of research are:

- Global Burden of Disease (GBD)
- Health System Performance Assessment
- Domestic Health Policy Reform
- Inequality and Inequity in Health
- Infectious Disease Modeling
- Non-Communicable Diseases
- Health Technology Assessment and Health Innovations
- Radiation Exposure and Health in Fukushima



### Community and Global Health

Our department acts for health and wellbeing of socially vulnerable people. Health itself is not necessarily our ultimate goal. How can an individual dream and reach her/his ultimate goal in life by making the best use of his/her health? This is more critical. We study and teach how it can be done in global settings. When any interventions are implemented, we continue to ask who receive real benefits from them.

<http://www.ich.m.u-tokyo.ac.jp/en/index.html>

- Health, nutrition, and development
- Health, human rights, and human security
- Ecological approach to infectious disease control
- Health promotion
- Disaster and health
- Human resources for health worldwide
- Maternal, newborn, and child health
- Implementation research

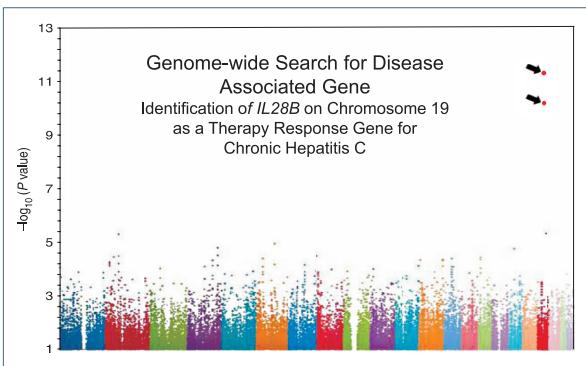


## Human Genetics

<http://www.humgenet.m.u-tokyo.ac.jp/>

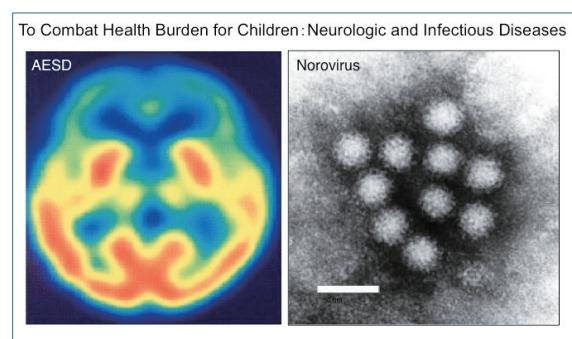
Department of Human Genetics is broadly interested in the human genome diversity, especially in the Asian populations. Specifically, we are using genomic research tools including SNP and HLA analyses, as well as gene expression profiling, to better understand the genetic background of a variety of complex diseases, especially bone and joint diseases, infectious diseases, immune related diseases and sleep disorders.

- Theoretical and experimental analyses on the genetics of complex diseases
  - Development of statistical approaches for susceptibility gene mapping in complex diseases
  - Comprehensive genetics of bone and joint diseases
  - Host susceptibility factors to infectious diseases
  - Genetic factors for immune related diseases
  - Molecular mechanisms of sleep disorders
- Analysis on the genome diversity of Asia-Pacific populations
- Development of methodologies for the analysis of protein interactions
- Construction of human genome variation database and imputation of HLA alleles from GWAS data



## Developmental Medical Sciences

Founded in 1966 as the Department of Maternal and Child Health, this department has devoted itself to the research and education on the maintenance and promotion of mothers' and children's health, including studies of infectious diseases, nutritional disorders and congenital anomalies. At present, the main research activities are experimental and epidemiological studies on the etiology (genetic and environmental factors), pathogenesis, prevention and treatment of various childhood brain disorders (congenital and acquired) that cause mental and motor disabilities and epilepsy, from the viewpoint of international health science and developmental neuroscience.



- Studies on developmental brain disorders
  - Abnormal neuronal differentiation and size control (tuberous sclerosis)
  - Neuronal migration disorders (lissencephaly, polymicrogyria)
  - Perinatal brain injury (periventricular leukomalacia)
  - Postnatal brain injury (acute encephalopathy)
  - Inherited metabolic disorders (peroxisomal and mitochondrial disorders)
- Molecular epidemiology of infectious diseases (diarrheal viruses)
- Field studies of maternal and child health (malnutrition, obesity)

## Human Ecology

<http://www.humeco.m.u-tokyo.ac.jp/>

Ecological understanding of health and survival of contemporary human populations through the analyses of nutritional, demographic, and environmental aspects of each population is our primary goal. Both fieldworks on various Asia-Oceania populations as well as experimental studies dealing with nutrition and environmental chemicals are conducted, which would serve as the basis in challenging the International Health issues.



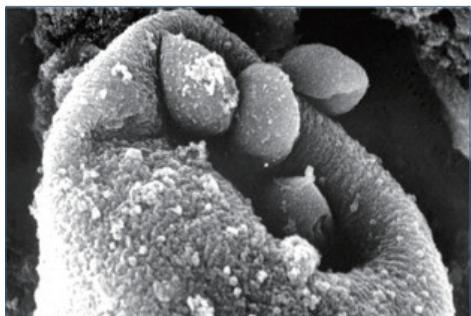
At a school in a survey area, West Java, Indonesia

- Mechanistic analyses of the effect of subsistence transitions on the health and environment in rural and urban communities in developing countries
- Application of GPS, GIS, and remote sensing to health ecology and international health
- Exposure-effects evaluation of chemical pollution of watershed in rural Indonesian children
- Nutritional ecology, subsistence ecology, medical anthropology and biological demography in Asia-Oceania populations
- Development effects of perinatal exposures to heavy metals, pesticides, or endocrine disrupting chemicals
- Modulating effects of nutrients and nutritional status on environmental hazardous chemicals
- Sustainable society and health

## Biomedical Chemistry

Our major research interests include virulence mechanisms and metabolism of protozoa, particularly *Plasmodium* spp. causing malaria and *Entamoeba histolytica* causing amebic dysentery. We mainly focus on vesicular trafficking, phagocytosis, autophagy, proteases, amino acid metabolisms, RNA maturation, translation, drug development, and organellogenesis. Our research approaches are very robust, and include biochemistry, molecular and cell biology, live imaging, multi-omics including metabolomics, and reverse genetics. Our present research themes include:

- Molecular elucidation of pathogenesis of parasites
- Biochemical and biological analyses of metabolism and organelles unique to parasites
- Analysis of vesicular traffic, protein secretion, and phagocytosis/trogocytosis in parasites
- Genome wide analysis and comparison of parasite strains
- Drug discovery and development against protozoan infections such as malaria and amebiasis
- Elucidation of divergence of RNA maturation and translation



*Entamoeba histolytica* eating human cells

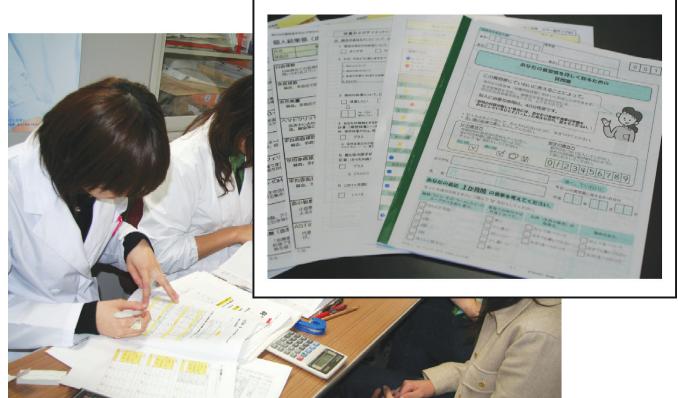


## School of Public Health

### Social and Preventive Epidemiology

Our main research field is preventive epidemiology on lifestyle-related diseases. This department is unique in Japan since our core research field is "nutritional epidemiology", which epidemiologically examines the roles of diets for disease prevention and control.

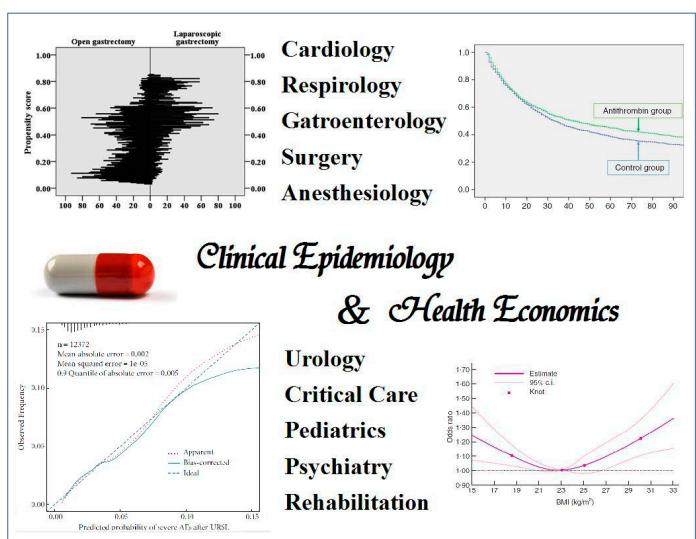
- Methodological studies on dietary assessments
- Nutritional epidemiologic studies on nutrient intakes/dietary behaviors and health status
- Studies on development of dietary promotion methods and evaluation of their effectiveness
- Establishment of literature database for "epidemiologic studies on diets and health"
- Collaborative studies with clinical trial groups on nutrition-related diseases



### Clinical Epidemiology and Health Economics

Through the cooperation with the specialists of epidemiology, statistics, clinical medicine, and economics, we implement multidisciplinary studies on clinical epidemiology, health economics, health technology assessment and health policy using large healthcare databases.

- Clinical epidemiological studies using the Diagnosis Procedure Combination database
- Health economics and policy studies using the governmental statistics
- Application of statistical methods for observational studies
- Integration of multiple databases

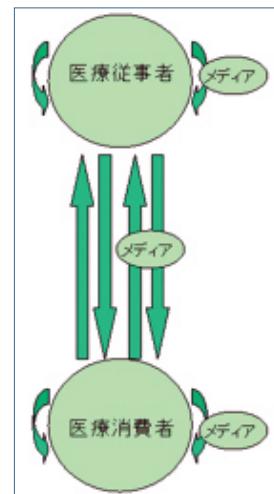


## Health Communication

The Department of Health Communication conducts research on the University hospital Medical Information Network (UMIN) Center related activities as well as health communication research at various levels.

Main research topics include;

- Communication of health information to general public
- Patient-provider relationship and communication
- Health literacy
- Activities related to the UMIN
- Information systems for clinical epidemiologic studies
- Security of the information network



## Mental Health

<http://plaza.umin.ac.jp/~heart/>

The Department of Mental Health has engaged in education and research on a wide range of topics related to mental health, such as social determinants of stress and mental health, and prevention of mental disorders and suicide. The Department provides classes of Mental Health I (epidemiology and countermeasures in mental health) and Mental Health II (occupational mental health).

- Community-based mental health epidemiology
- Occupational mental health
- Positive mental health and well-being
- Stress management
- Disaster and mental health
- Global mental health



The UNU-IIGH/UNDESA/the University of Tokyo Expert Meeting on Mental Well-being, Disability, and Development in Kuala Lumpur, Malaysia, April 2013

## Health and Social Behavior

The unit follows the legend of former departments of health sociology, health education, and social gerontology, and extends its academic endeavor to empirically reveal complex mechanisms between social structure/relationship and individual health/behavior. Through interdisciplinary and global communication with social science and health science, the unit aims at exploring research and education on social determinants of health, such as;

- Trans-generational health impact of socioeconomic status
- Health impact of retirement and social participation among the elderly
- Policy intervention design to alleviate social exclusion
- The impact of healthcare systems for health equity
- Social experiences of chronically ills and their health



Source: Dahlgren and Whitehead, 1991

## Biomedical Ethics

<http://www.ethps.m.u-tokyo.ac.jp/>

The Department of Biomedical Ethics conducts both theoretical and empirical studies in the fields of biomedical ethics, research ethics and clinical ethics. Research topics include ethical theories, informed consent, ethics committees and organ transplantation. The Center for Biomedical Ethics and Law (CBEL) was recently set up as an adjunct to the Department of Biomedical Ethics.

(<http://www.cbcl.jp/>)

- Study of the functions and responsibilities of ethics committees in Japan
- Study of the methods for the formation of social consensus related to advanced medical technology
- Comparative study of clinical ethics in the Asian region
- Acceptability of advance directives in Japan
- Development of evaluation methods for biomedical ethics education
- Psychosocial and ethical aspects of living related organ transplantation



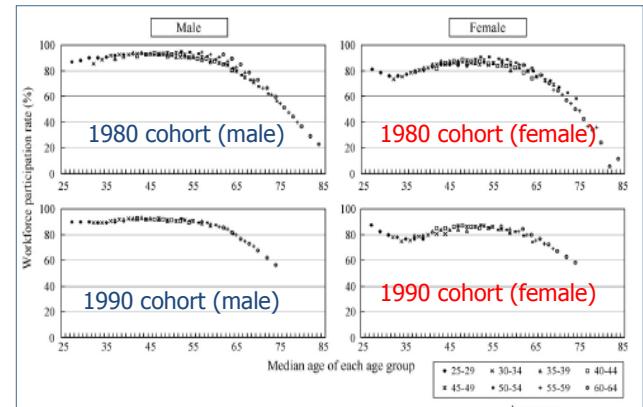
Outreach Program: CBEL provides training courses for ethics committee members. Participants include physicians, nurses and medical pharmaceutical representatives.

## Health Policy

<http://publichealth.m.u-tokyo.ac.jp/>

Health Policy is the academic fields in which scientific evidence is collected, established, accumulated, and disseminated for health policy making. Through studies in various aspects in health policy, our department aims to advance research, support policy development, and promote education toward these ends. This department is concurrently operated with Department of Public Health.

- Efficiency and equity issues of health systems
- Health manpower policy
- Occupational and environmental epidemiology
- Health services research



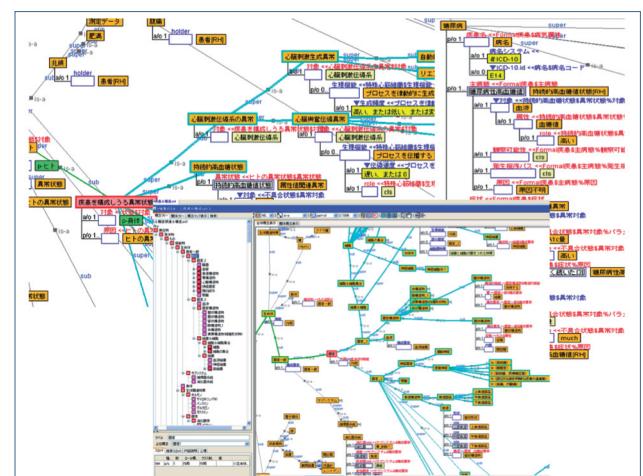
Physician workforce participation rate by age and gender in Japan

## Healthcare Informatics

<http://www.m.u-tokyo.ac.jp/medinfo/>

The department conducts the practical education and research on various issues about design, development and implementation of healthcare information systems as well as electronic health record systems. These issues cover broad range of topics regarding healthcare informatics as follows: basic infrastructure of healthcare information systems and roles there, organizational theories, information management and its ethics and standardization. Solutions of various problems for promoting ICT in clinical fields are also targeted. Since both the education-research section and the practical management section in the department are organized as a single unit, students can benefit from education in many ways in the environment of practical system management field.

- Integration and big-data analysis of healthcare database
- Medical knowledge extraction using natural language processing
- Development of clinical ontology
- Development of real-time monitoring for patient safety



Integrating multi-institutional healthcare data and medical ontology

## Clinical Information Engineering

Clinical Information Engineering focuses on computer applications that address biomedical data (collection, analysis, representation). It is a combination of information science, computer science, and clinical science designed to assist in the management and processing of data, information and knowledge to support the practice and delivery of clinical care and public health.

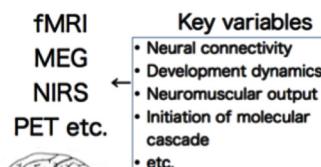
- CDecM: Clinical Decision Making (PEC model)
- ClinBi: Clinical Bioinformatics: Data Mining & Knowledge Discovery in Database
- ClinVR: Clinical Interactive 3D Computer Graphics & Virtual reality
- PHI: Social information engineering for Public Health (Public Health Informatics: GIS for Health Science etc.)

<http://home.cie.m.u-tokyo.ac.jp:8080/ciemutk>

### VR technology

II  
Naturalistic and contextually rich scenarios

II  
An exacting degree of control



A methodology of neuroscience using virtual reality

## Forensic Medicine and Medical Law

<http://forensicmed.umin.jp>

We conduct autopsies, and various examinations including histology, biochemistry, radiology, toxicology, and genetics as usual practices. We also perform the following research with other institutes and departments including Education and Research Center of Legal Medicine, Chiba University.

- Analysis and pathophysiology of illegal drugs including new psychoactive substances.
- Application of imaging modalities such as CT, or MRI for death investigation.
- Age and stature estimation and sex determination using CT.
- Mechanical properties of human tissue.
- Diagnosis of drowning.
- Application of relatively new DNA testing method for practice of forensic medicine



Forensic autopsy room



CT room

## School of Public Health

**Biostatistics** See **Biostatistics / Epidemiology and Preventive Health Sciences**(p42)

**Health Sociology and Health Education** See **Health and Social Behavior**(p50)



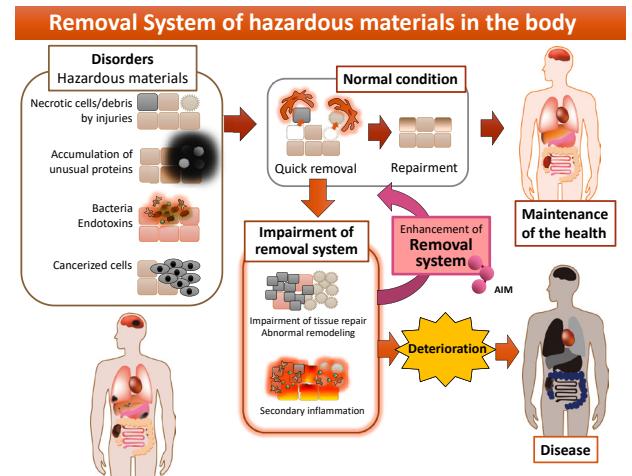
## Center for Disease Biology and Integrative Medicine

### Molecular Biomedicine for Pathogenesis

A variety of biological garbage such as necrotic cells, cancerous cells, excess lipids, or degenerated cells and proteins, are constitutively developed in our body. Such undesired substances are usually eliminated quickly, which is followed by tissue regeneration. Abrogation of such "removal system" may cause accumulation of garbage in tissues, accompanied by the secondary inflammation and fibrosis, resulting in the development of types of diseases. Thus, this scavenging response is essential to maintain the body in homeostasis and healthy state. Our overall goal is to apply our findings to develop a novel therapy based on this system against diseases.

- Elucidation of molecular mechanism of "removal system" conducted by serum protein AIM.
- Comprehension of diseases caused by abrogation of this removal system: acute kidney injury, chronic kidney disease, cancer, obesity, neurodegenerative diseases, autoimmune diseases, aging, etc.
- Development of novel therapies against diseases.

<http://tmlab.m.u-tokyo.ac.jp/english/index.html>

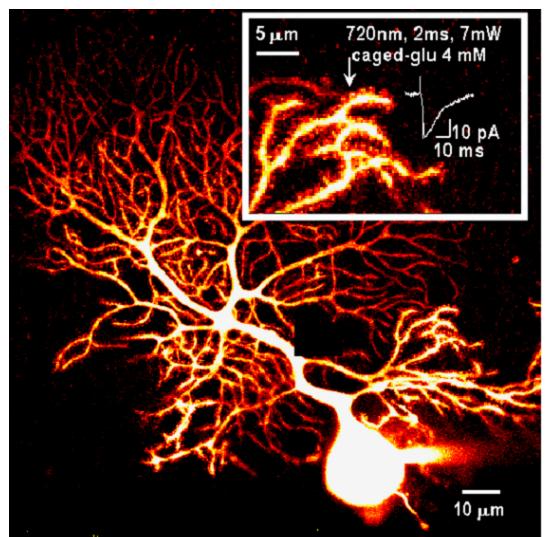


### Structural Physiology

We have been exploring two-photon excitation microscopy, which utilizes an infrared femtosecond-pulsed laser as a light source, to visualize and stimulate intact tissues at the cellular and molecular levels. We focus on the functions and disorders of the brain and secretory organs.

- The dynamics of synapses in the cerebral cortex, in relation to memory, cognitive processes and mental disorders
- Molecular mechanisms of exocytosis in synapses and the islet of Langerhans, and their optical control

<http://www.bm2.m.u-tokyo.ac.jp/index-e.html>

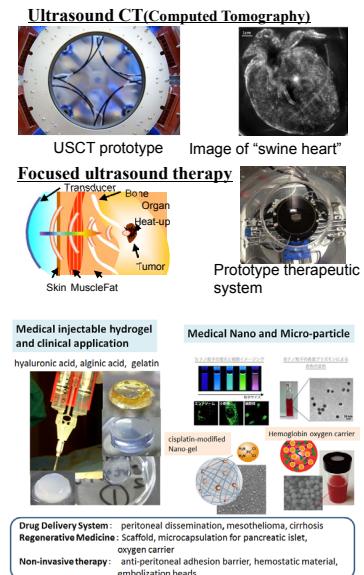


## Biomedical Equipment and Biomaterial

We aim to create a basic methodology for research and development of new biomedical equipment and biomaterial applicable clinical site by integrating bioengineering technology such as mechanical, measurement, material and chemical system engineering. For medical equipment, we focus on ultrasound imaging system for breast cancer screening, minimally invasive therapeutic system and combination therapy of ultrasound and drug. For biomaterial, we develop new biocompatible hydrogels based on polysaccharides, hyperbranched polymers, and DNA analogues, which materials are applied to drug delivery systems for peritoneal diseases, artificial red blood cells, and artificial pancreas islets.

- Ultrasound computed tomography
- Ultrasound minimally invasive therapy
- Ultrasound drug delivery system
- Fabrication of new biocompatible hydrogels
- Development of anti-peritoneal adhesion barrier and drug delivery system for peritoneal diseases
- Development of artificial pancreatic islet by a microencapsulation technique, and development of artificial red blood cells by a membrane emulsification technique

<http://www.cdbm.m.u-tokyo.ac.jp/>

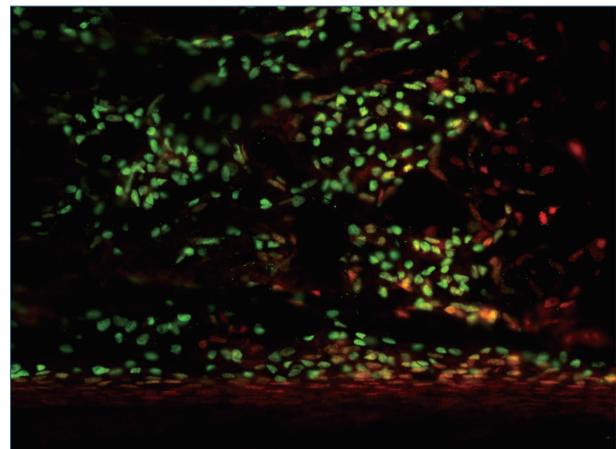


## Clinical Biotechnology

We pursue two scientific interests with a particular focus on skeletal tissues (bones and cartilages): (1) manipulation of progenitor cell differentiation and proliferation based on understanding of molecular mechanisms underlying cell fate specification, and (2) development of novel biomaterials fulfilling characteristics required for *in vivo* use as scaffolds. We aim to develop novel systems for skeletal tissue engineering and regenerative medicine, where cell differentiation and proliferation are directly regulated *in situ*.

- Understanding of epigenome dynamics and gene regulatory landscape in cell fate specification by genome-scale and bioinformatic approaches
- Identification of bioactive molecules for tissue regeneration, inspired by the gene regulatory landscape in progenitor differentiation and proliferation
- Creation of highly functional and biocompatible materials, based on design principle of biomaterials in materials science
- Development of tissue-inducing implant devices, which act as a carrier of bioactive molecules as well as a scaffold for tissue healing

<http://www.tetrapod.t.u-tokyo.ac.jp/ohba-tei/en/>

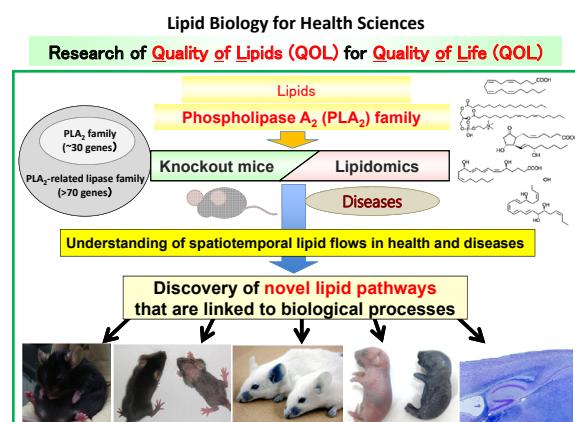


Development of osteoprogenitors expressing stage-specific molecules (green: Sp7, red: Runx2)

## Environmental and Metabolic Health Sciences

Lipids serve as the largest energy source, cell membrane components, and bioactive mediators. Lipids are major environmental substances supplied as nutrients and spatiotemporally regulate a variety of biological responses in response to given microenvironmental cues within tissues. Our research focuses on the regulation of biological networks driven by lipids and their metabolites. By taking advantages of an array of gene-manipulated mice for lipid-metabolizing enzymes and receptors, we aim to clarify novel lipid-orchestrated mechanisms underlying various diseases such as metabolic and immune disorders. Knowledges obtained from these approaches will be translated to humans toward discovery of new biomarkers or druggable targets.

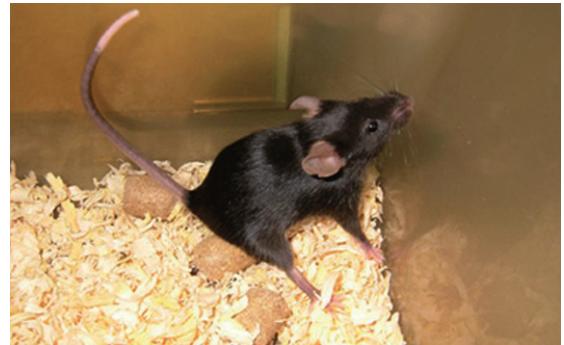
<http://env-health.m.u-tokyo.ac.jp/english.html>



## Animal Resources / Research Resources and Support - Animal Research

Our laboratory focuses on understanding the molecular mechanisms which underlie the brain function and cancer development. We also try to generate animal models for human genetic diseases. Recently we established the gene targeting methods using CRISPR/Cas system. We also manage the animal facilities, provide reproductive technology service, advice on animal experiments, and give lectures on laboratory animals so that animal experiments are carried out in accordance with animal welfare.

- Molecular analysis of brain function and cancer using genetically modified mice
- Development of new model animals for human diseases
- Development of gene targeting animals using CRISPR/Cas system



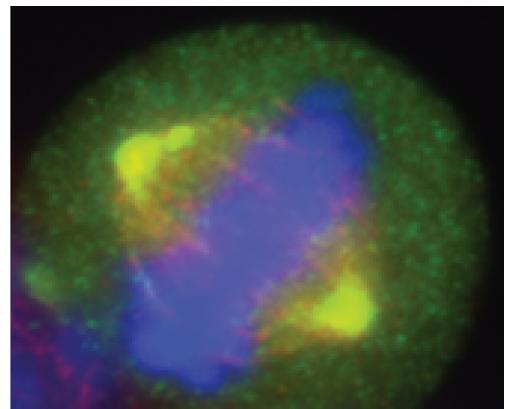
A mutant mouse lacking metabotropic glutamate receptor subtype-1 (*mGluR1*)

## Molecular Radiology / Research Resources and Support-Radiation Biology

<http://www.cdbim.m.u-tokyo.ac.jp/english/index.html>

We are investigating the molecular mechanisms of DNA double-strand break repair as the scientific basis of radiation therapy and chemotherapy in medical oncology. We also promote the basic research that contributes to the development of a novel therapeutic strategy by examining a link of the DNA metabolic network including DNA replication and cell cycle control with chromosome instability.

- Molecular mechanisms of homologous recombinational repair
- Mechanisms of the choice between homologous recombination and non-homologous end-joining
- Molecular mechanisms of DNA rereplication
- Mechanisms of the genesis of aneuploidy
- Functional analysis of meiotic recombination genes



Centrosome fragmentation which may lead to aneuploidy

## Biomedical Informatics / Research Resources and Support - Biomedical Informatics

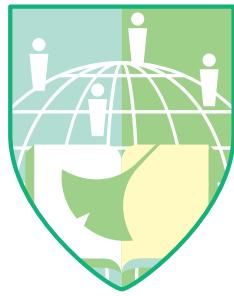
<http://www.cdbim.m.u-tokyo.ac.jp/english/index.html>

The department conducts researches on the development of medical artificial intelligence systems and their application to clinical practice (i.e., clinical decision support, knowledge discovery from big data, and so on), utilizing the combined approach of medical knowledge representation, logical reasoning, and machine learning techniques. We actively collaborate with the department of Medical informatics, Graduate School of medicine, and the department of Planning, Information and Management in the University of Tokyo Hospital, to conduct those researches using clinical information. Our activities also include the practical management of information infrastructure to support medical researches.

- Development and application of clinical ontology
- Development of clinical decision support systems using logical reasoning and machine learning
- Clinical text analysis and knowledge extraction using natural language processing
- Development of next-generation EHR system



Computer System for Biomedical Research



## The International Research Center for Medical Education

### Department of Medical Education Studies

Faculty and staff in this department do research on a wide range of topics in undergraduate and postgraduate medical education.

One goal is to move this field of inquiry forward by putting into practice the information obtained from action-oriented research done with full appreciation of the trends in international research on medical education. This department also makes important contributions to undergraduate and postgraduate medical curricula, in ways that promote the development of research-minded and clinically skilled medical practitioners who can meet and exceed the highest international standards and can become global leaders.



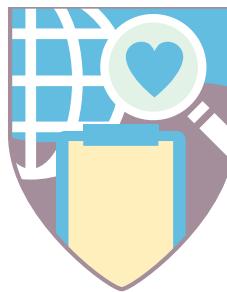
Lecture by former Prof. Kitamura

### Department of International Cooperation for Medical Education

This department is to aim at participating international cooperation projects in medical education area and conducting practical research and development through activities mainly in Asian countries. Furthermore the department domestically and internationally collects information and expands human exchanges regarding international cooperation in medical education area, and supports projects related to medical education.



PBL class in Kabul Medical University, Afghanistan

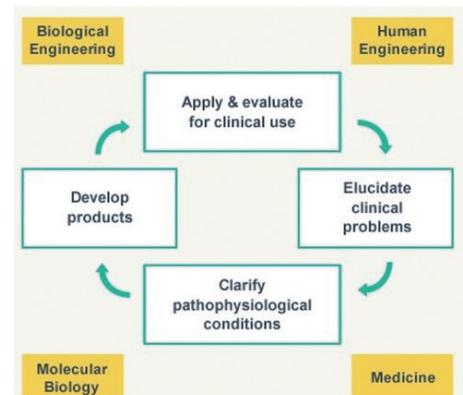


# Global Nursing Research Center

## Division of Care Innovation

With a falling birthrate and a super-aging society, Japan is in need of a paradigm shift that will move it away from a 'medical care that cures' toward a 'Medical and nursing care that supports.' In such a situation, nursing science that plays a key role of 'care' is expected to foster different fields of interdisciplinary research / educational environments aiming to nurture young nursing researchers who can lead care innovation. In our department, with bio-scientist/engineering researchers and companies, we aim to develop and care products that reduce the inconvenience of daily life due to the health impairment of each person, accept young researchers and establish an innovative nursing research fields based on transdisciplinary integration.

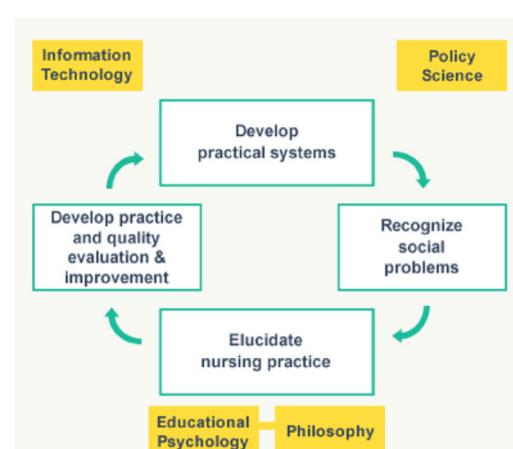
- Robotics Nursing
  - Software development of communication robots
  - Measurement of nursing behavior
- Biological Nursing
  - Elucidation of the pathology and molecular mechanism of dry skin of the elderly
  - Elucidation of the pathophysiology and molecular mechanism of skin maceration
- Imaging Nursing
  - Development of ultrasonic technical support systems to support nursing care
  - Development of telemedicine systems using imaging technology
- Translation Research
  - Clinical evaluation of robotic mattress
  - Clinical evaluation of diabetic foot ulcer evaluation scale in Indonesia

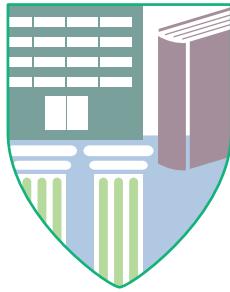


## Division of Nursing System

We promote research activities with the aim of 'providing nursing practice solutions that reflect important cultural and social concerns, constructing Japan-origin nursing theories that support high quality practices, and making policy proposals.' Health Quality and Outcome Research department contributes to developing a methodology to evaluate their health quality well, conducting studies using outcomes from their perspectives, and then finally creating new effective and optimized nursing systems in order to improve the total of quality of life and health quality among. At the Department of Care Quality Management, we explore new research methodologies/innovations of research for care quality assurance and continuous quality improvement system.

- Health Quality and Outcome Research
  - Practice and evaluate nursing care directly or indirectly
  - Deploy research using patient-reported outcomes
  - Explore new health quality indicator
  - Develop evaluation methodologies to understand health quality among overall family and nursing system well
- Care Quality Management
  - Knowledge development in caring practice
  - Support for care workers
  - Care quality assurance in community care system
  - Development of quality indicators and benchmarking





## Institution

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### The Office of International Academic Affairs

The Office of International Academic Affairs is under the direct authority of the Dean of the Graduate School of Medicine. Its four most important roles, as defined by the Committee on International Academic Affairs, are i) international educational exchange, ii) international contacts in research and scientific fields, iii) helping young researchers excel not only as scientists, but also as educators for the next generation and as administrators of their research groups, and iv) holding Medical English classes and developing language-teaching materials for medical students.

<http://koryu.m.u-tokyo.ac.jp/homepage10.html>

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### Medical Scientist Training Program

Medical Scientist Training Program was launched in 2008, aiming that medical students have the opportunity to experience basic medical research in their early years and learn the attitude as a researcher. Students taking this program will attend activities such as journal club, medical English course, an assignment to the lab, and FQ, during their free time in addition to their usual curriculum. Students are also expected to build up a network among medical students who intend to be a researcher through the program support, such as the short term stay at labs abroad, participations to the symposium, and the excursion with other universities.

<http://www.ut-mdres.umin.jp/>



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## **Office for Research Ethics Support**

The Office for Research Ethics Support (ORES) aims to protect the rights, health, and dignity of research participants. Based on this principle, ORES supports researchers at the Graduate School of Medicine, the Faculty of Medicine and the University Hospital to perform their studies in an ethical manner. Our primary task is the management of the Ethics Committee secretariat. Additionally, we plan and manage research ethics seminars, provide ethics education to researchers through consultations, develop human resources for future research ethics specialists, and conduct related researches.

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## **Life Sciences Core Facility**

Life Sciences Core Facility provides researchers at the graduate school of medicine and the faculty of medicine access and technical assistance to specialized instruments including mass spectrometers, cell sorters, flow cytometers and a state-of-the-art fluorescent microscope.

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## **The Office for Clinical Practice and Medical Education**

The Office for Clinical Practice and Medical Education, formerly the Clinical Clerkship Support Center, was established in April 2015, to support and promote medical education, especially clinical practice in the 5th and 6th years. The aim is to facilitate clinical clerkship management, as well as to improve the clerkship curriculum and evaluation methods through consultation of the teaching staff and interviews with students. In addition, we try to support individual students in cooperation with the Faculty of Medicine's educational administrators and the Office for Student Assistance.

## Medical Library

<http://www.lib.m.u-tokyo.ac.jp>

The University of Tokyo Medical Library was opened in 1961 as a model of the Japanese modern medical library. The view makes it a perfect place to concentrate on study.

The library has adopted an open stack system so that users can have direct access to almost all the materials.

- Holdings:  
Books(number of volumes) : 271,912 (Japanese 106,037 Foreign 165,875)  
Periodicals(number of titles): 3,971 (Japanese 1,979 Foreign 1,992)
- Visitors: 79,109
- Borrowed Books: 17,784

(as of March 31 2016)



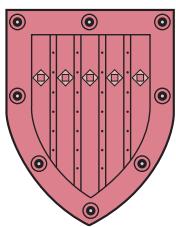
## Museum of Health and Medicine

<http://mhm.m.u-tokyo.ac.jp/>

Museum of Health and Medicine was planned as part of commemorative projects to celebrate the anniversary of the founding of the School and the University of Tokyo Hospital, and was opened on 20, 2011. The permanent exhibition was a display medical archives and instruments from the early era, Ishihara's Color Blind Test Charts and a developed at the University. Special exhibitions planned to promote understanding among the regarding advances in medical science and health. Following the first special exhibition related to beginnings of the School and the Hospital, entitled "Challenge to Infectious Diseases", ten special exhibitions which introduced blood vessel, cancer, brain, locomotive syndrome, diabetes mellitus, growth of the child, legal medicine, colon ,virus were held.

We will hold two special exhibitions every year and specialevents for our visitors.





# Graduate School of Medicine Faculty of Medicine The University of Tokyo



Hongo-sanchome Stn.  
on Subway Line  
● : Marunouchi Line  
● : Oh-edo Line



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The University of Tokyo

