

The University of Tokyo
Faculty of Medicine
Graduate School of Medicine



PROSPECTUS
2009—2010





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

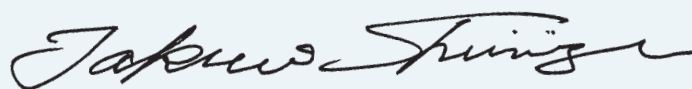
Faculty of Medicine, the University of Tokyo was established in 1858, and in May of 2008 we celebrated the 150th anniversary of our founding. University Executives, faculty members, staff, and students came together for an impressive birthday ceremony, and a student-designed monument was installed in front of our main building. To mark the occasion, we also decided to renovate our clinical amphitheater and lecture rooms, to establish a museum of health and medicine, and to start a new program of scholarships for students interested in research.

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 100 students begin medical school and about 40 are admitted to School of Health Sciences and Nursing (which from 2010 onwards we will call the "School of Integrated Health Sciences"). 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. 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 new 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. We have internationally prominent teachers and researchers working in a wide variety of fields, and numerous endowed departments that embody productive relations between academia and industry.

Through our four Global Centers of Excellence (GCOE), 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.



Takao Shimizu
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 Seiyo Igaku-Sho (Institute of Western Medicine) and offered courses of Western Medicine in the fields of Education, Autopsy, and Vaccination.
1863	Feb.	Seiyo 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 Phoniatics 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.
2003	Apr.	The Center for Disease Biology and Integrative Medicine was established.
2004	Apr.	All the National Universities owned by the Japanese Government became National University Corporations. and the University of Corporation.
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.

Graduate School of Medicine	
Molecular Cell Biology	Cell Biology and Anatomy <ul style="list-style-type: none"> Cell Biology • Structural Biology • Structural Cell Biology • Cellular Neurobiology Biochemistry and Molecular Biology <ul style="list-style-type: none"> Molecular Biology • Cellular Signaling • Physiological Chemistry and Metabolism
Functional Biology	Physiology <ul style="list-style-type: none"> Integrative Physiology • Cellular and Molecular Physiology • Neurophysiology Pharmacology <ul style="list-style-type: none"> Cellular and Molecular Pharmacology • Molecular Neurobiology
Pathology, Immunology and Microbiology	Pathology <ul style="list-style-type: none"> Pathology and Diagnostic Pathology • Molecular Pathology Microbiology <ul style="list-style-type: none"> Microbiology • Infection Control and Prevention Immunology <ul style="list-style-type: none"> Immunology
Radiology and Biomedical Engineering	Radiology <ul style="list-style-type: none"> Diagnostic Radiology • Radiotherapy • Nuclear Medicine Biomedical Engineering <ul style="list-style-type: none"> System Physiology • Bioimaging and Biomagnetics • Biosystem Construction and Control
Neuroscience	Basic Neuroscience <ul style="list-style-type: none"> Neuropathology • Neurochemistry • Neurobiology Speech and Cognitive Sciences (2010.4~ Integrative Medical Neuroscience) <ul style="list-style-type: none"> Speech Science • Cognitive Neuroscience • Speech Physiology (2010.4~ • Developmental Neuroscience • Cognitive Neuroscience • Systems Medical Neuroscience • Child Neuropsychiatry) Clinical Neuroscience <ul style="list-style-type: none"> Neuropsychiatry • Neurology • Neurosurgery
Social Medicine	Occupational, Environmental and Preventive Medicine <ul style="list-style-type: none"> Molecular Preventive Medicine • Public Health • Radiological Health Forensic Medicine, and Medical Informatics and Economics <ul style="list-style-type: none"> Forensic Medicine • Medical Informatics and Economics
Internal Medicine	Medicine I <ul style="list-style-type: none"> Cardiovascular Medicine • Vascular Biology • Respiratory Medicine • Gastroenterology • Nephrology Medicine II <ul style="list-style-type: none"> Endocrinology • Nutrition and Metabolism • Hematology and Oncology • Allergy and Rheumatology Infectious Diseases • Stress Science and Psychosomatic Medicine Clinical Laboratory Medicine and Pathology <ul style="list-style-type: none"> Clinical Laboratory Medicine • Transfusion Medicine
Reproductive, Developmental and Aging Sciences	Obstetrics and Gynecology <ul style="list-style-type: none"> Reproductive Endocrinology • Gynecological Oncology • Perinatal Medicine • Molecular Cellular Reproductive Medicine Pediatric Sciences <ul style="list-style-type: none"> Pediatrics • Developmental Pediatrics • Pediatric Surgery • Pediatric Oncology Aging Sciences <ul style="list-style-type: none"> Geriatrics • Aging Research
Surgical Sciences	Surgery <ul style="list-style-type: none"> Thoracic Surgery • Cardiovascular Surgery • Gastrointestinal Surgery Hepatobiliary Pancreatic Surgery • Urology • Artificial Organ and Transplantation Division Surgical Oncology • Vascular Surgery • Metabolic Care and Endocrine Surgery Sensory and Motor System Medicine <ul style="list-style-type: none"> Dermatology • Plastic and Reconstructive Surgery • Oral and maxillofacial Surgery • Orthopaedic Surgery Ophthalmology • Otorhinolaryngology, and Head & Neck Surgery • Rehabilitation Medicine Vital Care Medicine <ul style="list-style-type: none"> Anesthesiology • Emergency and Critical Care Medicine
Health Sciences and Nursing	Health Sciences <ul style="list-style-type: none"> Health Sociology • Mental Health • Epidemiology and Preventive Health Sciences Social Gerontology • Health Promotion Sciences • Biostatistics • Biomedical Ethics Preventive and Administrative Nursing <ul style="list-style-type: none"> Advanced Clinical Nursing • Nursing Administration • Family Nursing • Community Health Nursing • Public Health Nursing Clinical Nursing <ul style="list-style-type: none"> Adult Nursing • Palliative Care Nursing • Midwifery and Women's Health Psychiatric Nursing • Gerontological Nursing • Wound Care Management
International Health	International Social Medicine <ul style="list-style-type: none"> Global Health Policy • Community and Global Health International Biomedical Sciences <ul style="list-style-type: none"> Human Genetics • Developmental Medical Sciences • Human Ecology • Biomedical Chemistry
School of Public Health	Epidemiology and Health Sciences <ul style="list-style-type: none"> Biostatistics • Social and Preventive Epidemiology • Health Economics and Epidemiology Research Health Communication Behavioral Health Sciences <ul style="list-style-type: none"> Mental Health • Health Sociology and Health Education • Social Gerontology Health Promotion Science • Biomedical Ethics Health Services Sciences <ul style="list-style-type: none"> Health Policy • Healthcare Informatics • Clinical Information Engineering • Forensic Medicine and Medical Law
Center for Disease Biology and Integrative Medicine	<ul style="list-style-type: none"> Laboratory of Molecular Biomedicine for Pathogenesis • Laboratory of Structural Physiology • Laboratory of Regenerative Medical Engineering • Laboratory of Clinical Biotechnology • Laboratory of Environmental Health Sciences Laboratory of Animal Resources • Laboratory of Molecular Radiology • Divisions of Research Resources and Support (Section of Animal Research, Section of Radiation Biology, Section of Bioinformatics)

Endowed Department	<ul style="list-style-type: none"> Pharmacoepidemiology • Integrated Traditional Medicine (Tsumura) • Vascular Regeneration (Daiichi Sankyo Co.,Ltd) • Bone & Cartilage Regenerative Medicine • Cartilage & Bone Regeneration (FujiSoft) Clinical Renal Regeneration • Metabolome • Clinical Molecular Epidemiology (Mitsubishi Tanabe Pharma Corporation) • Immunotherapeutics (Medinet) • Total Renal Care Medicine • Integrated Molecular Science on Metabolic Diseases • Advanced Clinical Science and Therapeutics • Kaatsu Training Translational Research for Healthcare and Clinical Science • Joint Disease Research • Health Care Management and Policy • Computational Diagnostic Radiology and Preventive Medicine Hospital Environment • Clinical Motor System Medicine • Medical Safety Management (Tokio Marine & Nichido) • Molecular Cardiovascular Metabolism • Healthcare Quality Assessment • Anti-Aging Medicine Integrated Imaging Informatics • Nutriproteomics • Clinical Epidemiology and Systems Clinical Trial Data Management • Pharmacology and Pharmacokinetics • Ubiquitous Preventive Medicine Science for Joint Reconstruction • Molecular Research for Vascular Diseases • Advanced Skin Care (Miss Paris) • Therapeutic Strategy for Heart Failure • Molecular Physiology on Energy Metabolism Molecular Neuroscience on Neurodegeneration • Chronic Kidney Disease • Molecular Structure and Dynamics (JEOL/Zeiss) • Molecular Vascular Endocrinology • Medical Genomics
Special Coordination Funds for Promoting Science and Technology	<ul style="list-style-type: none"> Translational Systems Biology and Medicine Initiative
Global COE	<ul style="list-style-type: none"> Integrative Life Science Based on the Study of Biosignaling Mechanisms Comprehensive Center of Education and Research for Chemical Biology of the Diseases Creation of a New Interdisciplinary and International Base for Biomedical Ethics Education and Research Medical System Innovation through Multidisciplinary Integration
Social Cooperation Program	<ul style="list-style-type: none"> Ubiquitous Health Informatics
Special Education Research Project	<ul style="list-style-type: none"> Child Psychiatry Clinical Education Frontier project • Cancer Genomics Project
Coordination, Support and Training Program for Translational Research	<ul style="list-style-type: none"> Organization of the Center for Supporting Innovative Medicine and Execution of Translational Research
Institution	<ul style="list-style-type: none"> International Academic Affairs • Medical Library • Medical Scientist Training Program
Faculty of Medicine	
School of Medicine	<ul style="list-style-type: none"> Cell Biology and Anatomy • Biochemistry and Molecular Biology • Physiology • Pharmacology Pathology • Microbiology • Immunology • Radiology • Biomedical Engineering • Basic Neuroscience Speech and Cognitive Sciences • 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 Health Sciences and Nursing (2010.4 - School of Integrated Health Sciences)	<ul style="list-style-type: none"> Family Nursing • Community Health Nursing • Fundamental Nursing • Adult Health and Nursing Mental Health and Nursing • Health Sociology • Health Administration • Epidemiology and Biostatistics Human Ecology • Biochemistry and Nutrition • Maternal and Child Health
University Hospital	
Clinical Division	<p>Internal Medicine • General Medicine • Cardiovascular Medicine • Respiratory Medicine • Gastroenterology • Nephrology and Endocrinology • Metabolic Diseases • Hematology and Oncology • Allergy and Rheumatology • Infectious Diseases • Neurology • Geriatric Medicine • Psychosomatic Medicine</p> <p>Surgery • General Surgery • Stomach and Esophageal Surgery • Colon and Rectal Surgery • Hepatobiliary Pancreatic Surgery • Vascular Surgery • Breast and Endocrine Surgery • Artificial Organ and Transplantation Surgery • Cardiovascular Surgery • Thoracic Surgery • Neurosurgery</p> <p>Sensory and Motor System Medicine • Dermatology and Photolaser Medicine • Ophthalmology and Vision Correction • Orthopaedic Surgery and Spinal Surgery • Otorhinolaryngology, and Auditory and Voice Surgery • Rehabilitation Medicine • Plastic, Reconstructive, and Aesthetic Surgery</p> <p>• Oral-Maxillofacial Surgery, Dentistry and Orthodontics</p> <p>Pediatrics, Perinatal and Women's Medicine • Pediatrics • Pediatric Surgery • Obstetrics and Gynecology</p> <p>Neuropsychiatry • Neuropsychiatry</p> <p>Radiology • Radiology</p>
Central Clinical Facilities	<ul style="list-style-type: none"> Pharmaceutical Services • Clinical Laboratory • Surgical Center • Radiological Center • Emergency Services Transfusion Medicine and Immunohematology • Maternal, Fetal, and Neonatal Medicine • Rehabilitation Service • Central Supply Service • Medical Engineering • Intensive Care Unit • Pathology • Corneal Transplantation • University Hospital Medical Information Network Center • Cell Therapy and Transplantation Medicine • Infection Control and Prevention • Endoscopy and Endoscopic Surgery • Hemodialysis and Apheresis • Clinical Research Center • Medical Community Network • Planning, Information and Management • Organ Transplantation Service • Nursing • Nutrition • Labor Safety and Health Management Office • Child Psychiatry • Tissue Bank • Epidemiology and Preventive Medicine • Cancer Patient Support Center • Center for Liaison and Public Relations • Database Center of the National University Hospitals Outpatient Chemotherapy • Neonatal and Pediatric Intensive Care Unit • Tissue Engineering • Clinical and Genetic Informatics • Palliative Medicine • Clinical Genomics • Cooperative Unit of Medicine and Engineering Research • Medical Specialists Training Center
Translational Research Center	
22nd Century Medical and Research Center	
Administration Office	
Center	
	<ul style="list-style-type: none"> The International Research Center for Medical Education
Administrative Division	
	<ul style="list-style-type: none"> General Affairs Office • Personnel Office • Research Liaison • Educational Affairs Graduate Student Affairs • Budget Office • Purchasing Office • Finance Office Facilities Office • Reception Service Medical Library Administration Office Medical Library • Information Service Medical Library



Molecular Cell Biology

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Cell Biology and Anatomy*

Department of Cell Biology

Associate Professor Yosuke Takei

Department of Structural Biology

Professor Masahide Kikkawa

Department of Structural Cell Biology

Associate Professor Yoshimitsu Kanai

Department of Cellular Neurobiology

Professor Shigeo Okabe

Biochemistry and Molecular Biology

Department of Molecular Biology*

Professor Hiroto Okayama

Associate Professor Shigeki Jinno

Department of Cellular Signaling*

Professor Takao Shimizu

Associate Professor Motonao Nakamura

Associate Professor Satoshi Ishii

Department of Physiological Chemistry and Metabolism*

Professor Hiroki Kurihara



Functional Biology

P18

Physiology

Department of Integrative Physiology*

Professor Yasushi Miyashita

Associate Professor Seiki Konishi

Department of Cellular and Molecular Physiology*

Professor Kensaku Mori

Department of Neurophysiology*

Professor Masanobu Kano

Associate Professor Kouichi Hashimoto

Pharmacology

Department of Cellular and Molecular Pharmacology*

Professor Masamitsu Iino

Department of Molecular Neurobiology*

Professor Masayoshi Mishina



Pathology, Immunology and Microbiology

P20

Pathology

Department of Pathology and Diagnostic Pathology*

Professor Masashi Fukayama

Department of Molecular Pathology*

Professor Kohei Miyazono

Associate Professor Tetsuro Watabe

Microbiology

Department of Microbiology*

Professor Masanori Hatakeyama

Department of Infection Control and Prevention*

Professor Kyoji Moriya

Immunology

Department of Immunology*

Professor

Tadatsugu Taniguchi



Radiology and Biomedical Engineering

P22

Radiology*

Department of Diagnostic Radiology

Professor Kuni Ohtomo

Associate Professor Osamu Abe

Department of Radiotherapy

Associate Professor Keiichi Nakagawa

Department of Nuclear Medicine

Associate Professor Toshimitsu Momose

Biomedical Engineering

Department of System Physiology*

Department of Bioimaging and Biomagnetics

Department of Biosystem Construction and Control*

Associate Professor Yusuke Abe



Neuroscience

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Basic Neuroscience

Department of Neuropathology*

Professor

Takeshi Iwatsubo

Department of Neurochemistry*

Associate Professor Haruhiko Bito

Department of Neurobiology

Professor Kenzo Hirose

**Speech and Cognitive Sciences
(2010.4~ Integrative Medical Neuroscience)**

Department of Speech Science

(2010.4~ Department of Developmental Neuroscience)

Department of Cognitive Neuroscience*

(2010.4~ Department of Cognitive Neuroscience)

Associate Professor Katsuyuki Sakai

Department of Speech Physiology

(2010.4~ Department of Systems Medical Neuroscience)

(2010.4~ Department of Child Neuropsychiatry)

Clinical Neuroscience

Department of Neuropsychiatry*

Professor Kiyoto Kasai

Associate Professor Nobuo Nakayasu

Associate Professor Hidenori Yamasue

Department of Neurology*

Professor Shoji Tsuji

Associate Professor Shin Kwak

Department of Neurosurgery*

Professor Nobuhito Saito

Associate Professor Kensuke Kawai



Social Medicine

P28

Occupational, Environmental and Preventive Medicine

Department of Molecular Preventive Medicine*

Professor Kouji Matsushima
Associate Professor Sho Ishikawa-Yamawaki

Department of Public Health*

Professor Yasuki Kobayashi
Associate Professor Takahiro Higashi

Department of Radiological Health

Forensic Medicine, and Medical Informatics and Economics

Department of Forensic Medicine*

Professor Ken-ichi Yoshida

Department of Medical Informatics and Economics*

Professor Kazuhiko Ohe



Internal Medicine

P30

Medicine I

Department of Cardiovascular Medicine*

Professor Ryoza Nagai

Department of Vascular Biology

Department of Respiratory Medicine*

Professor Takahide Nagase

Department of Gastroenterology*

Professor Kazuhiko Koike

Department of Nephrology*

Medicine II

Department of Endocrinology*

Professor Toshiro Fujita

Department of Nutrition and Metabolism*

Professor Takashi Kadowaki
Associate Professor Kohjiro Ueki

Department of Hematology and Oncology*

Professor Mineo Kurokawa

Department of Allergy and Rheumatology*

Professor Kazuhiko Yamamoto

Department of Infectious Diseases*

Associate Professor Hiroshi Yotsuyanagi

Department of Stress Science and Psychosomatic Medicine*

Professor Akira Akabayashi
Associate Professor Kazuhiro Yoshiuchi

Clinical Laboratory Medicine and Pathology

Department of Clinical Laboratory Medicine*

Professor Yutaka Yatomi
Associate Professor Hitoshi Ikeda

Department of Transfusion Medicine*

Professor Koki Takahashi



Reproductive, Developmental and Aging Sciences

P34

Obstetrics and Gynecology and Gynecology

Department of Reproductive Endocrinology*

Professor Yuji Taketani
Associate Professor Tomoyuki Fujii

Department of Gynecological Oncology*

Associate Professor Tetsu Yano

Department of Perinatal Medicine*

Department of Molecular Cellular Reproductive Medicine*

Professor Shiro Kozuma

Pediatric Sciences

Department of Pediatrics*

Professor Takashi Igarashi
Associate Professor Akira Kikuchi

Department of Developmental Pediatrics*

Professor Takashi Igarashi
Associate Professor Sachiko Kitanaka

Department of Pediatric Surgery*

Professor Tadashi Iwanaka
Associate Professor Yutaka Kanamori

Department of Pediatric Oncology*

Professor Tadashi Iwanaka

Aging Sciences

Department of Geriatrics*

Professor Yasuyoshi Ouchi
Associate Professor Masahiro Akishita

Department of Aging Research

Professor Yasuyoshi Ouchi



Surgical Sciences

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Surgery

Department of Thoracic Surgery*

Associate Professor Jun Nakajima

Department of Cardiovascular Surgery*

Professor Minoru Ono
Associate Professor Arata Murakami

Department of Gastrointestinal Surgery*

Professor Yasuyuki Seto
Associate Professor Sachiyo Nomura

Department of Hepatobiliary Pancreatic Surgery*

Professor Norihiro Kokudo
Associate Professor Kiyoshi Hasegawa

Department of Urology*

Professor Yukio Honma
Associate Professor Haruki Kume

Department of Artificial Organ and Transplantation Division*

Associate Professor Yasuhiko Sugawara

Department of Surgical Oncology*

Professor Hirokazu Nagawa
Associate Professor Joji Kitayama

Department of Vascular Surgery*

Professor Hirokazu Nagawa
Associate Professor Tetsuro Miyata

Department of Metabolic Care and Endocrine Surgery*

Associate Professor Toshihisa Ogawa

Sensory and Motor System Medicine

Department of Dermatology*

Professor Shinichi Sato
Associate Professor Kanako Kikuchi

Department of Plastic and Reconstructive Surgery*

Professor Isao Koshima

Department of Oral and Maxillofacial Surgery*

Professor Tsuyoshi Takato
Associate Professor Takafumi Susami
Associate Professor Yoshiyuki Mori

Department of Orthopaedic Surgery*

Professor Kozo Nakamura
Associate Professor Hiroshi Kawaguchi
Associate Professor Sakae Tanaka

Department of Ophthalmology*

Professor Makoto Araie
Associate Professor Satoshi Kato
Associate Professor Yasuhiro Tamaki

Department of Otorhinolaryngology and Head & Neck Surgery*

Professor Tatsuya Yamasoba
Associate Professor Shinichi Iwasaki
Associate Professor Takahiro Asakage

Department of Rehabilitation Medicine*

Professor Nobuhiko Haga

Vital Care Medicine

Department of Anesthesiology*

Professor Yoshitsugu Yamada

Department of Emergency and Critical Care Medicine*

Professor Naoki Yahagi



Health Sciences
and Nursing

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Health Sciences

Department of Health Sociology*

Associate Professor Yoshihiko Yamazaki

Department of Mental Health*

Professor Norito Kawakami
Associate Professor Akihito Shimazu

Department of Epidemiology and Preventive Health Sciences*

Professor Yasuo Ohashi

Department of Social Gerontology*

Professor Ichiro Kai

Department of Health Promotion Sciences*

Associate Professor Jung Su Lee

Department of Biostatistics*

Associate Professor Yutaka Matsuyama

Department of Biomedical Ethics*

Professor Akira Akabayashi

Preventive and Administrative Nursing

Department of Advanced Clinical Nursing*

Professor Katsuya Kanda

Department of Nursing Administration*

Professor Katsuya Kanda

Department of Family Nursing*

Associate Professor Kiyoko Kamibeppe

Department of Community Health Nursing*

Professor Sachiyo Murashima

Department of Public Health Nursing

Clinical Nursing

Department of Adult Nursing*

Professor Keiko Kazuma

Department of Palliative Care Nursing*

Professor Keiko Kazuma

Department of Midwifery and Women's Health*

Department of Psychiatric Nursing*

Professor Norito Kawakami

Department of Gerontological Nursing*

Professor Hiromi Sanada

Department of Wound Care Management*

Professor Hiromi Sanada



International
Health

P50

International Social Medicine

Department of Global Health Policy*

Professor Kenji Shibuya
Associate Professor Rintaro Mori

Department of Community and Global Health*

Professor Masamine Jimba

International Biomedical Sciences

Department of Human Genetics*

Professor Katsushi Tokunaga
Associate Professor Akihiko Mabuchi

Department of Developmental Medical Sciences*

Professor Masashi Mizuguchi
Associate Professor Teruyuki Tanaka

Department of Human Ecology*

Professor Chiho Watanabe
Associate Professor Masahiro Umezaki

Department of Biomedical Chemistry*

Professor Kiyoshi Kita
Associate Professor Yoh-ichi Watanabe



School of Public
Health

P54

Epidemiology and Health Sciences

Department of Biostatistics

Professor Yasuo Ohashi
Associate Professor Yutaka Matsuyama

Department of Social and Preventive Epidemiology*

Professor Satoshi Sasaki

Department of Health Economics and Epidemiology Research*

Professor Hideki Hashimoto
Associate Professor Takashi Fukuda

Department of Health Communication

Professor Takahiro Kiuchi

Behavioral Health Sciences

Department of Mental Health

Professor Norito Kawakami
Associate Professor Akihito Shimazu

Department of Health Sociology and Health Education

Associate Professor Yoshihiko Yamazaki

Department of Social Gerontology

Professor Ichiro Kai

Department of Health Promotion Science

Associate Professor Jung Su Lee

Department of Biomedical Ethics

Professor Akira Akabayashi

Health Services Sciences

Department of Health Policy

Professor Yasuki Kobayashi
Associate Professor Takahiro Higashi

Department of Healthcare Informatics

Professor Kazuhiko Ohe

Department of Clinical Information Engineering*

Professor Hiroshi Oyama

Department of Forensic Medicine and Medical Law

Professor Ken-ichi Yoshida



**Center for Disease
Biology and
Integrative Medicine**

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Director Masayoshi Mishina

Laboratory of Molecular Biomedicine for Pathogenesis*

Professor Toru Miyazaki

Laboratory of Structural Physiology*

Professor Haruo Kasai
Associate Professor Masanori Matsuzaki

Laboratory of Regenerative Medical Engineering*

Professor Takashi Ushida
Associate Professor Taichi Ito

Laboratory of Clinical Biotechnology*

Professor Kazunori Kataoka
Associate Professor Nobuhiro Nishiyama

Laboratory of Environmental Health Sciences*

Professor Chiharu Tohyama
Associate Professor Seichiroh Ohsako

Laboratory of Animal Resources*

Professor Atsu Aiba

Laboratory of Molecular Radiology*

Professor Kiyoshi Miyagawa

Divisions of Research Resources and Support *

(Section of Animal Research)

(Section of Radiation Biology)

(Section of Bioinformatics)

Endowed Department

Pharmacoepidemiology

professor Kiyoshi Kubota

Department of Integrated Traditional Medicine (Tsumura)

Associate Professor Tetsuro Okabe

Department of Vascular Regeneration (Daiichi Sankyo Co., Ltd.)

Associate Professor Hiroyuki Koyama

Department of Bone & Cartilage Regenerative Medicine

Associate Professor Naofumi Ogata

Department of Cartilage & Bone Regeneration (Fujisoft)

Associate Professor Kazuto Hoshi

Department of Clinical Renal Regeneration

Associate Professor Keiichi Hishikawa

Department of Metabolome

Professor Ryo Taguchi
Associate Professor Yoshiya Oda

Clinical Molecular Epidemiology (Mitsubishi Tanabe Pharma Corporation)

Associate Professor Takanari Gotoda

Immunotherapeutics (Medinet)

Associate Professor Kazuhiro Kakimi

Division of Total Renal Care Medicine

Associate Professor Akira Ishikawa

Integrated Molecular Science on Metabolic Diseases

Associate Professor Toshimasa Yamauchi

Department of Advanced Clinical Science and Therapeutics

Associate Professor Junichi Suzuki
Associate Professor Yasunobu Hirata

Kaatsu Training

Associate Professor Toshiaki Nakajima

Translational Research for Healthcare and Clinical Science

Associate Professor Hiroyuki Morita

Department of Joint Disease Research

Associate Professor Noriko Yoshimura

Health Care Management and Policy

Associate Professor Hideo Yasunaga

Computational Diagnostic Radiology and Preventive Medicine

Associate Professor Naoto Hayashi
Associate Professor Kansei Uno

Hospital Environment

Associate Professor Yushi Uetera

Clinical Motor System Medicine

Associate Professor Toru Akune

Medical Safety Management (Tokio Marine & Nichido)

Professor Yasushi Kodama

Molecular Cardiovascular Metabolism

Associate Professor Katsuyuki Ando

Department of Healthcare Quality Assessment

Associate Professor Hiroaki Miyata

Anti-Aging Medicine

Professor Satoshi Inoue

Integrated Imaging Informatics

Associate Professor Naoki Yoshioka

Department of Nutriproteomics

Professor Kazumi Yagasaki

Clinical Epidemiology and Systems

Professor Tsutomu Yamazaki
Associate Professor Daisuke Koide

Clinical Trial Data Management

Associate Professor Takuhiro Yamaguchi

Pharmacology and Pharmacokinetics

Associate Professor Akihiro Hisaka

Ubiquitous Preventive Medicine

Associate Professor Toru Suzuki

Science for Joint Reconstruction

Professor Yoshio Takatori
Associate Professor Toru Moro

Molecular Research for Vascular Diseases

Associate Professor Daisuke Nagata

Advanced Skin Care (Miss Paris)

Professor Junko Sugama

Therapeutic Strategy for Heart Failure

Professor Shunei Kyo
Associate Professor Satoshi Gojo

Molecular Physiology on Energy Metabolism

Associate Professor Naoya Yahagi

Molecular Neuroscience on Neurodegeneration

Associate Professor Atsushi Iwata

Chronic Kidney Disease

Associate Professor Miki Nagase

Molecular Structure and Dynamics (JEOL / Zeiss)

Molecular Vascular Endocrinology

Associate Professor Masashi Isshiki

Department of Medical Genomics

Professor Hiroyuki Mano

Associate Professor CHOI Young Lim

Special Coordination Funds for Promoting Science and Technology

Translational Systems Biology and Medicine Initiative

Associate Professor Naoto Kubota

Global COE

Integrative Life Science Based on the Study of Biosignaling Mechanisms

Comprehensive Center of Education and Research for Chemical Biology of the Diseases

Associate Professor Iairo Manabe

Associate Professor Hiroshi Kawasaki

Creation of a New Interdisciplinary and International Base for Biomedical Ethics Education and Research

Medical System Innovation through Multidisciplinary Integration

Associate Professor Keiji Itaka

Social Cooperation Program

Department of Ubiquitous Health Informatics

Associate Professor Hideo Fujita

Special Education Research Project

Child Psychiatry Clinical Education Frontier project

Associate Professor Yukiko Kano

Cancer Genomics Project

Associate Professor Seishi Ogawa

Coordination, Support and Training Program for Translational Research

Organization of the Center for Supporting Innovative Medicine and Execution of Translational Research

Professor Tomoki Todo

Associate Professor Yasushi Iino

Institution

Office of International Academic Affairs

Head Tatsuya Yamasoba

Medical Library

Head Kazuhiko Ohe

Medical Scientist Training Program

Head Shigeo Okabe

Faculty of Medicine

Dean Takao Shimizu

University Hospital

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Director

Yuji Taketani

Clinical Division (Department of Internal Medicine)

General Medicine

Professor Shoji Tsuji

Cardiovascular Medicine

Professor Ryoza Nagai

Respiratory Medicine

Professor Takahide Nagase

Gastroenterology

Professor Kazuhiko Koike

Nephrology and Endocrinology

Professor Toshiro Fujita

Metabolic Diseases

Professor Takashi Kadowaki

Associate Professor Kojiro Ueki

Hematology and Oncology

Professor Mineo Kurokawa

Allergy and Rheumatology

Professor Kazuhiko Yamamoto

Infectious Diseases

Professor Kyoji Moriya

Associate Professor Hiroshi Yotsuyanagi

Neurology

Professor Shoji Tsuji

Associate Professor Shin Kwak

Geriatric Medicine

Professor Yasuyoshi Ouchi

Associate Professor Masahiro Akishita

Psychosomatic Medicine

Professor Akira Akabayashi

Associate Professor Kazuhiro Yoshiuchi

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Stomach and Esophageal Surgery

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Associate Professor Sachiyo Nomura

Colon and Rectal Surgery

Professor Hirokazu Nagawa

Associate Professor Joji Kitayama

Hepatobiliary Pancreatic Surgery

Professor Norihiro Kokudo

Associate Professor Kiyoshi Hasegawa

Vascular Surgery

Associate Professor Tetsuro Miyata

Breast and Endocrine Surgery

Associate Professor Toshihisa Ogawa

Artificial Organ and Transplantation Surgery

Professor Norihiro Kokudo

Associate Professor Yasuhiko Sugawara

Cardiovascular Surgery

Professor Minoru Ono

Associate Professor Arata Murakami

Thoracic Surgery

Associate Professor Jun Nakajima

Neurosurgery

Professor Nobuhito Saito

Associate Professor Kensuke Kawai

Anesthesiology and Pain Relief Center

Professor Yoshitsugu Yamada

Urology and Andrology

Professor Yukio Honma

Associate Professor Haruki Kume

Gynecologic Surgery

Associate Professor Tetsu Yano

Clinical Division (Department of Sensory and Motor System Medicine)

Dermatology and Photolaser Medicine

Professor Shinichi Sato
Associate Professor Kanako Kikuchi

Ophthalmology and Vision Correction

Professor Makoto Araie
Associate Professor Yasuhiro Tamaki
Associate Professor Satoshi Kato

Orthopaedic Surgery and Spinal Surgery

Professor Kozo Nakamura
Associate Professor Hiroshi Kawaguchi
Associate Professor Sakae Tanaka

Otorhinolaryngology, and Auditory and Voice Surgery

Professor Tatsuya Yamasoba
Associate Professor Shinichi Iwasaki
Associate Professor Takahiro Asakage

Rehabilitation Medicine

Professor Nobuhiko Haga

Plastic, Reconstructive and Aesthetic Surgery

Professor Isao Koshima

Oral-Maxillofacial Surgery, Dentistry and Orthodontics

Professor Tsuyoshi Takato
Associate Professor Takafumi Susami
Associate Professor Yoshiyuki Mori

Clinical Division (Department of Pediatrics, Perinatal and Women's Medicine)

Pediatrics

Professor Takashi Igarashi
Associate Professor Sachiko Kitataka
Associate Professor Akira Kikuchi

Pediatric Surgery

Professor Tadashi Iwanaka
Associate Professor Yutaka Kanamori

Obstetrics and Gynecology

Professor Shiro Kozuma
Associate Professor Tomoyuki Fujii

Clinical Division (Department of Neuropsychiatry)

Neuropsychiatry

Professor Kiyoto Kasai
Associate Professor Nobuo Nakayasu
Associate Professor Hidenori Yamasue

Clinical Division (Department of Radiology)

Radiology

Professor Kuni Ohtomo
Associate Professor Keiichi Nakagawa
Associate Professor Toshimitsu Momose
Associate Professor Osamu Abe

Central Clinical Facilities

Pharmaceutical Services*

Professor Hiroshi Suzuki
Associate Professor Kousei Ito

Clinical Laboratory*

Director Yutaka Yatomi
Vice Director Hitoshi Ikeda

Department of Surgical Center*

Professor Hiroshi Yasuhara
Associate Professor Yoshikazu Mimura
Associate Professor Kazuhiko Fukatsu

Department of Radiological Center

Professor and Director Kuni Ohtomo
Associate Professor Masaaki Akabane

Department of Emergency Services

Professor Naoki Yahagi

Department of Transfusion Medicine and Immunohematology

Professor Koki Takahashi

Department of Maternal, Fetal, and Neonatal Medicine

Professor Shiro Kozuma

Department of Rehabilitation Service

Professor Nobuhiko Haga

Department of Medical Engineering

Central Supply Service

Associate Professor Yoshikazu Mimura
Associate Professor Kazuhiko Fukatsu

Department of Intensive Care Unit

Professor Naoki Yahagi

Department of Diagnostic Pathology

Professor Masashi Fukayama

Department of Corneal Transplantation

Associate Professor Shiro Amano

University Hospital Medical Information Network Center*

Professor Takahiro Kiuchi

Department of Cell Therapy and Transplantation Medicine

Professor Mineo Kurokawa

Department of Infection Control and Prevention

Professor Kyoji Moriya

Department of Endoscopy and Endoscopic Surgery

Associate Professor Mitsuhiro Fujishiro

Department of Hemodialysis and Apheresis

Professor Toshiro Fujita
Associate Professor Eisei Noiri

Clinical Research Center

Professor Takashi Kadowaki
Associate Professor Yoshihiro Arakawa

Department of Medical Social Community Network

Professor Yasuyoshi Ouchi

Department of Planning, Information and Management

Professor Kazuhiko Ohe
Associate Professor Soichi Koike

Department of Organ Transplantation Service

Professor Norihiro Kokudo
Associate Professor Yasuhiko Sugawara

Nursing Department

Department of Nutrition

Labor Safety and Health Management Office

Professor Kiyoshi Kitamura

Department of Child Psychiatry

Professor Takashi Igarashi
Associate Professor Yukiko Kano

Tissue Bank

Center for Epidemiology and Preventive Medicine

Professor Tsutomu Yamazaki

Cancer Patient Support Center

Center for Liaison and Public Relations

Professor Kazuhiko Ohe

Database Center of the National University Hospital

Department of Outpatient Chemotherapy

Professor Norihiro Kokudo

Neonatal and Pediatric Intensive Care Unit

Associate Professor Arata Murakami

Division of Tissue Engineering

Professor Tsuyoshi Takato

Department of Clinical and Genetic Informatics

Professor Ryozi Nagai
Professor Takashi Kadowaki

Department of Palliative Medicine

Associate Professor Keiichi Nakagawa

Department of Clinical Genomics

Professor Shoji Tsuji

Cooperative Unit of Medicine and Engineering Research

Associate Professor Tetsuro Miyata
Associate Professor Hiroyuki Koyama

Medical Specialists Training Center

Associate Professor Nobuyuki Shimizu

Translational Research Center

Professor Ryozo Nagai
Professor Tomoki Todo

22nd Century Medical and Research Center

Professor Kozo Nakamura

Administration Office

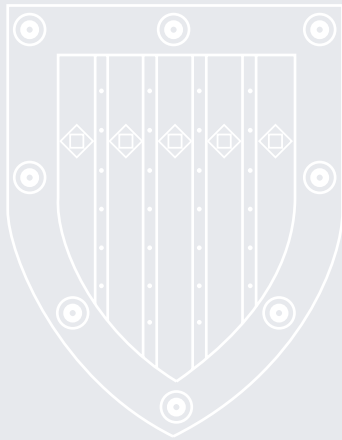


Center

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The International Research Center for Medical Education*

Director Kazuhiko Yamamoto
Professor Kiyoshi Kitamura



Faculty of Medicine Graduate School of Medicine The University of Tokyo

Graduate School of Medicine

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Molecular Cell Biology

Cell Biology and Anatomy

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

Cells transport various kinds of proteins, lipids and mRNAs after synthesis to their specific destinations such as several types of membranous organelles, protein complexes and the mRNA complex. Thus, intracellular transport is fundamental to cellular functions, survival and morphogenesis. Our laboratory is studying the mechanisms of intracellular transport and cellular morphogenesis, especially focusing on molecular motors, Kinesin superfamily proteins (KIFs) and microtubule associated proteins (MAPs) using molecular cell biology, biophysics, structural biology, and molecular genetics.

- Molecular cell biological study of KIFs
- Studies of the mechanism for recognition of and binding to cargoes by KIFs and the regulation of this mechanism
- Studies of the mechanisms of differential directional transports and sorting
- Studies of the dynamics and mechanism of motility of KIFs using molecular biophysics and structural biology
- Molecular genetics of KIFs
- Studies of KIFs and related diseases
- Molecular cell biology and molecular genetics of MAPs



Quick freeze-deep etch electron micrograph of a mouse nerve axon showing a microtubule (25 nm diameter, linear tube-like structure) and a cross-bridge linking the microtubule and a membranous organelle. Microtubules are a major component of the cytoskeleton and serve as a type of rail along which motor proteins transport organelles inside cells. (Reproduced from the cover of Science vol. 279, Jan 23 1998.)

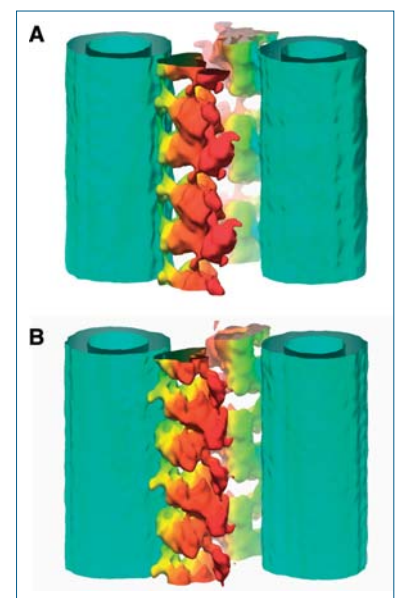
Structural Biology

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

Kikkawa lab is interested in flagella/cilia, which works as an actuator as well as a sensor of cells. We are studying the mechanism of formation and function of flagella/cilia using cryo-electron microscopy, optical microscopy, and genetics. We are also developing new technologies to analyze images taken by microscopes.

Our focuses are:

- Molecular formation of flagella and axonemal dyneins.
- Mechanism of force generation by dyneins.
- Structures of microtubule-associated proteins
- Development of new image analysis methods for cryo-electron microscope

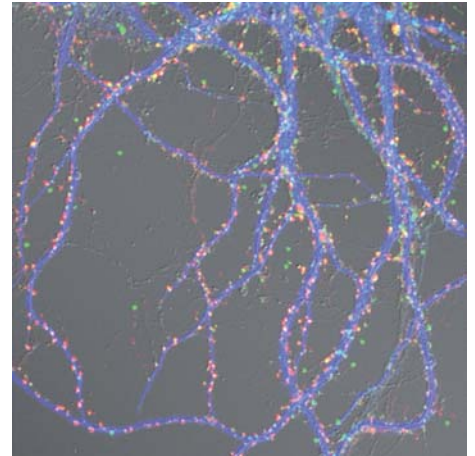


Three dimensional reconstruction of the outer dynein arm-microtubule complex from wild type. A: rigor state and B: relaxed state.

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



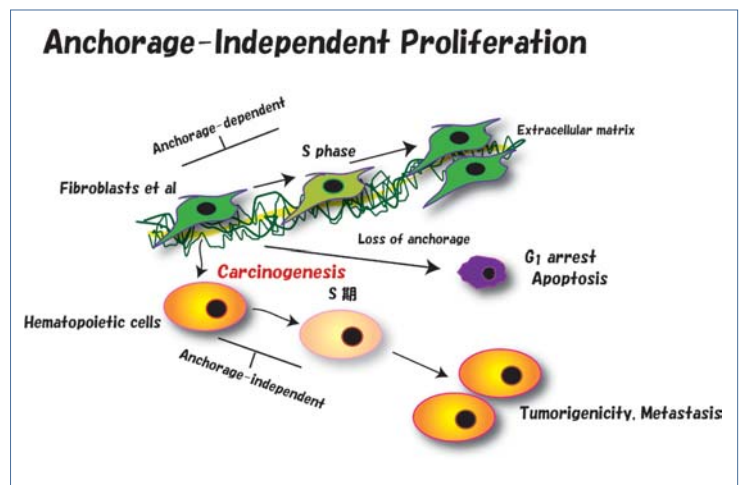
Quantitative fluorescence imaging of cultured hippocampal neurons (green: postsynaptic protein and calibrated fluorescent microspheres, red: presynaptic protein, blue: microtubule-associated protein)

Molecular Biology

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

We have been studying the molecular mechanism enabling anchorage-independent S phase onset that is the key for malignant transformation.

- Understanding the anchorage signal cascades that control cell cycling
- Understanding the mechanism by which anchorage signals control the G1-S transition



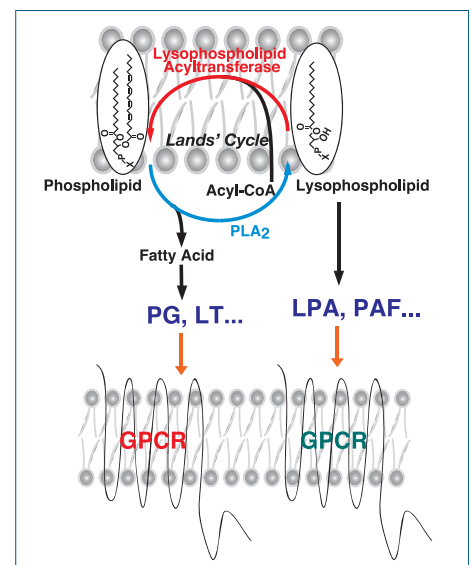
Cellular Signaling

http://biochem2.umin.jp/index_j.html

Our laboratory specializes in biochemistry, molecular and cellular biology, and genetic engineering to elucidate the roles of lipid mediators in vivo. We further study the molecular mechanism and biological significance of diversity and asymmetry of cellular membrane lipids. In collaboration with the Department of Metabolome, we analyze stimulus induced dynamic changes in the lipid composition of the cellular membrane.

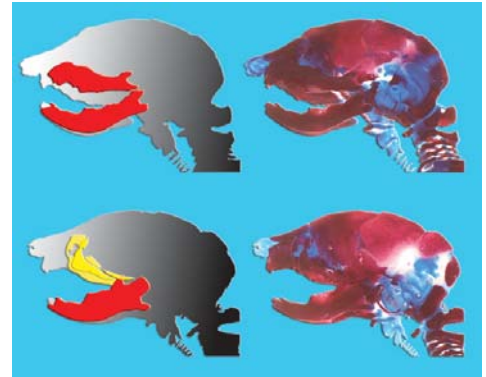
- Discovery and structural determination of novel lipid mediators
- Cloning, functional characterization and K/O studies of enzymes involved in the metabolism of lipid mediators and receptors for lipid mediators
- Structure, function and dynamics of GPCR
- Lipidomics and enzyme characterization of membrane organization

Production of lipid mediators during Lands' Cycle and activation of GPCRs
(Shimizu, T., Ann. Rev. Pharmacol. Toxicol. 49, 123-150, 2009)

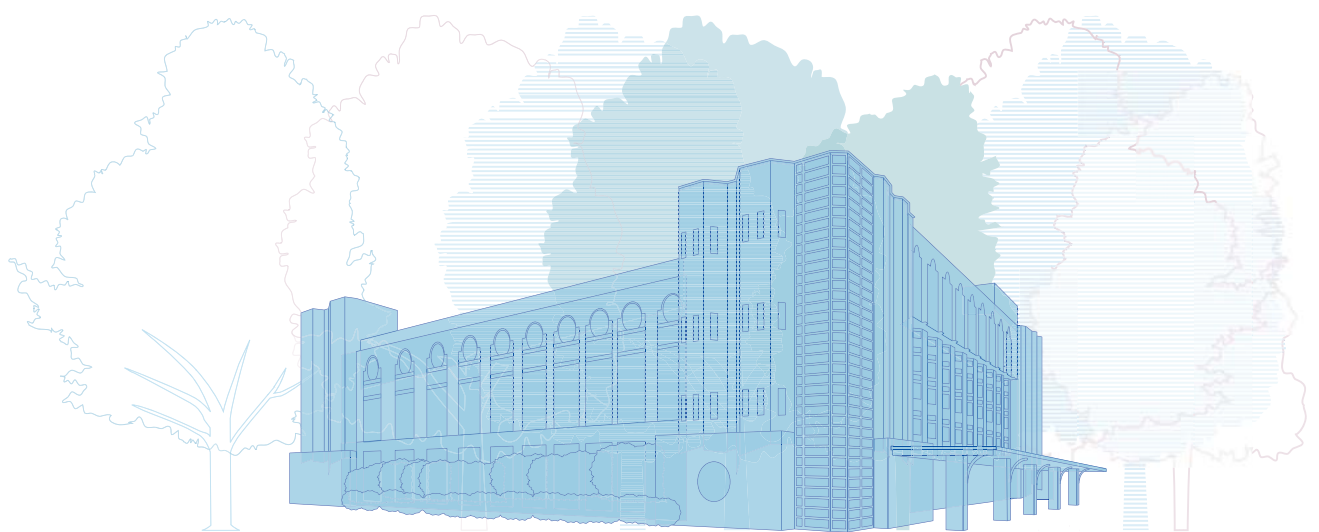


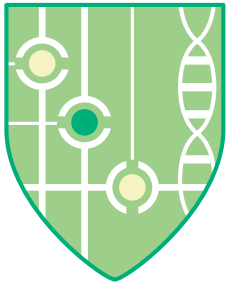
We are investigating signaling mechanisms underlying cell fate determination, morphogenesis and organogenesis in embryonic development.

- Molecular mechanisms of neural crest fate determination and craniofacial morphogenesis
- Molecular mechanisms of cardiovascular development
- Epigenetic control of embryonic development
- Roles of microRNA 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.





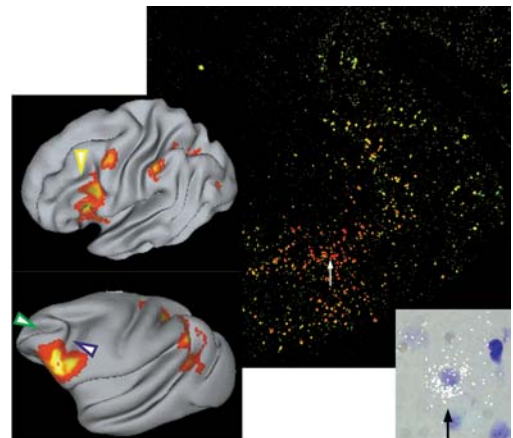
Functional Biology

Integrative Physiology

<http://www.physiol.m.u-tokyo.ac.jp/indexe/indexe.html>

Our laboratory specializes in the neuroscience research on cognitive functions in the primate. We investigate interactions among many neurons in the cerebral cortex, which create human cognitive abilities such as memory and its cognitive control. These studies have been done through integrative efforts using electrophysiological, molecular biological and neuroimaging approaches.

- Functions of memory neurons in the temporal cortex
- Roles of the top-down signal from the prefrontal cortex
- Functional differentiations of the prefrontal cortex in memory
- Molecular biological basis of declarative memory in the primate
- Development of high-field MRI for humans and monkeys



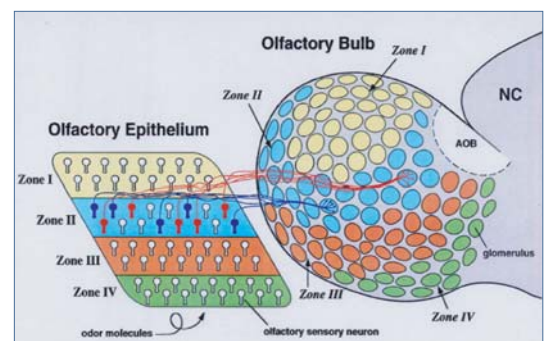
Brain activation in cognitive tasks (left) and gene expression (BDNF) in cortical neurons

Cellular and Molecular Physiology

<http://morilab.m.u-tokyo.ac.jp/eindex.html>

We aim at a better understanding of neuronal mechanisms involved in sensory perception of the external world and for the emotional state induced in the brain by sensory inputs. We are currently analyzing the central nervous system for olfaction, a sensory modality that has a strong influence on human emotion. Another major focus is to understand cellular and molecular mechanisms for contact-mediated interactions between neurons and immune cells that occur in pathological and physiological conditions.

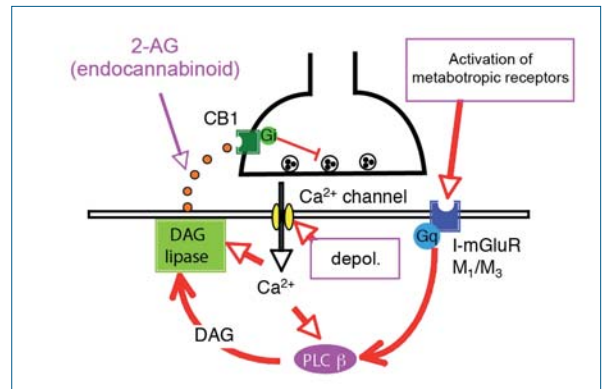
- Functional analysis of the neuronal circuit in the central olfactory nervous system (Analysis of odor maps in the brain)
- Neurogenesis and neuron-elimination in the adult brain
- Cellular and molecular mechanisms for the contact-mediated interactions between neurons and immune cells in physiological and pathological conditions



Neuronal circuits and 'odor maps' in the olfactory nervous system

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 make real time monitoring of neuronal activities, 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

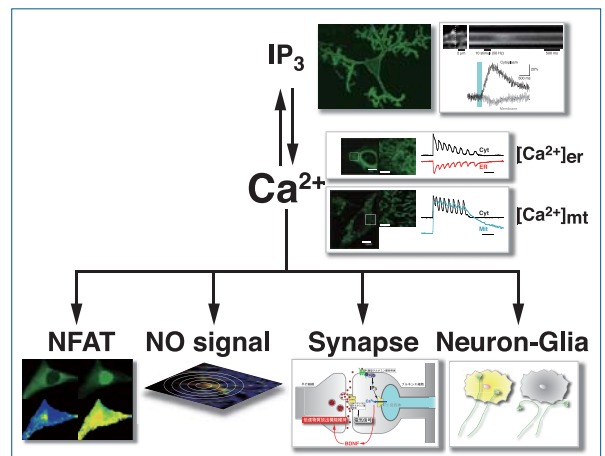


Molecular mechanisms of endocannabinoid-mediated retrograde modulation of synaptic transmission

Cellular and Molecular Pharmacology

Spatiotemporal distribution of signalling molecules is extremely important in defining cell signals. We are developing indicators of important signalling molecules and visualize their spatiotemporal distribution within intact cells. Using such novel imaging methods we aim at elucidation of the physiological roles of calcium signalling and related signalling mechanisms in various types of cells including neurons of the central nervous system.

- Development of novel fluorescent indicators of signaling molecules
- Elucidation of the mechanism for spatiotemporal regulation of Ca^{2+} signals
- Exploration of new cellular functions that are regulated by Ca^{2+} signals
- Visualization and analysis of molecular events at synapses

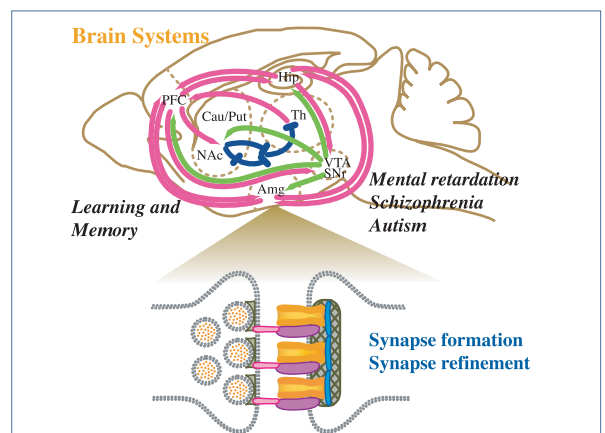


Outline of our research on Ca^{2+} signaling

Molecular Neurobiology

We have been investigating the molecular basis of higher brain functions by focusing on the glutamate receptor and memory. Previous studies have led to the hypothesis that there is a common principle between memory signaling and synapse formation. The combination of conditional gene targeting in mice and molecular genetics in zebra fish will facilitate our understanding of the mechanism of higher brain function at the molecular, cellular and neural network levels.

- Regulation of brain functions by glutamate receptors in specific brain regions
 - Identification of neural networks for learning and memory
 - Regulation of learning and memory
 - Roles of glutamate receptors in decision-making
- Signaling from glutamate receptors to memory
- Molecular mechanisms of synapse formation and remodeling
 - Molecular mechanism of synapse formation during development
 - Molecular mechanism of synapse remodeling in the adult brain



From synaptic molecules to brain function and dysfunction



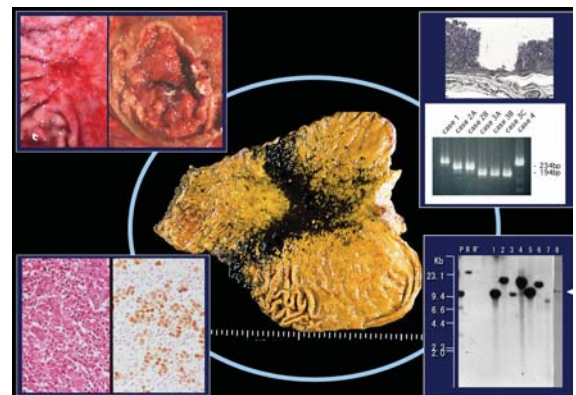
Pathology, Immunology and Microbiology

Pathology and Diagnostic Pathology

http://pathol.umin.ac.jp/index_e.htm

We investigate the pathogenesis and pathobiology of disease, 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 neoplasm
 - Epstein-Barr virus associated gastric carcinoma
 - Epigenetics of carcinoma
 - Carcinoma-stromal interaction
 - Lung adenocarcinoma and its scar formation
 - Lung fibrosis and adenocarcinoma
- Application of molecular pathology to pathological diagnosis
 - Discovery of cancer therapy target by DNA chip technology
 - Establishment of objective criteria for cancer grading
 - Streamlining and acceleration of pathological diagnostic processes



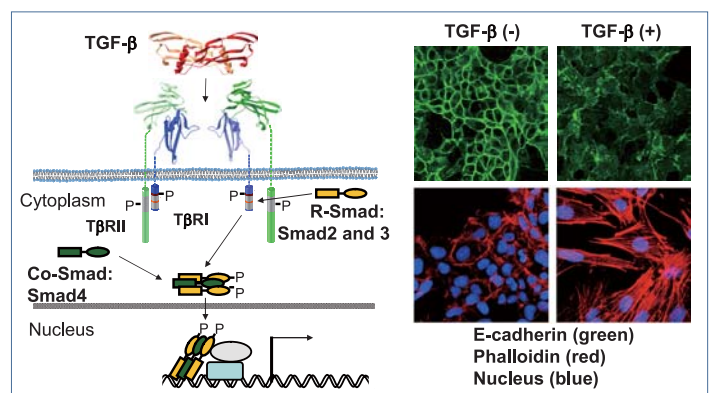
Investigation of the development of EB virus-associated gastric carcinoma

Molecular Pathology

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

Our research is focused on the molecular mechanisms of carcinogenesis. We study the signaling mechanisms of the TGF- β superfamily, including TGF- β and bone morphogenetic proteins (BMPs), and elucidate how they regulate progression of cancers. We also investigate the mechanisms of differentiation of murine embryonic stem cells (ESCs) into various cells, including vascular and lymphatic endothelial cells. Based on these findings, we will develop new strategies for the treatment of vascular and lymphatic diseases and cancer.

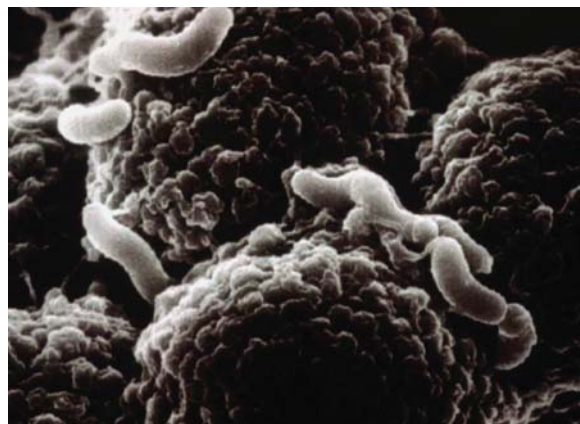
- Molecular mechanisms of growth regulation by TGF- β
- Roles of TGF- β in epithelial-to-mesenchymal transition
- Negative regulation of TGF- β signaling by inhibitory Smads and oncogene c-Ski
- Differentiation of mouse ESCs into vascular cells
- Roles of TGF- β superfamily cytokines in vascular and lymphatic diseases
- Differentiation of vascular and lymphatic endothelial cells and mechanisms of diseases



Signaling by TGF- β (left) and TGF- β -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* oncoprotein 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

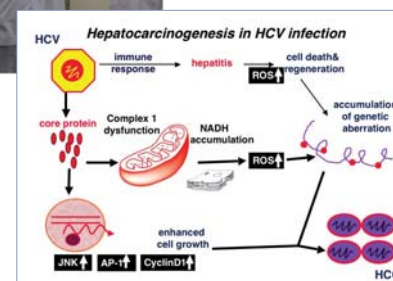
Infection Control and Prevention

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



Infection control team rounds



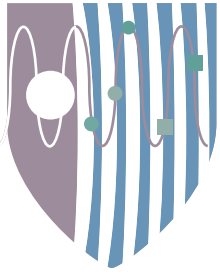
Immunology

Since its initial identification of the genes for interferon (IFN)- β and interleukin (IL)-2, our laboratory has continued to elucidate the signal transduction and transcriptional regulatory networks involved in immunity and oncogenesis.

- The signaling and transcriptional networks that operate in the regulation of and by IFN- α/β during innate immune responses,
- The role and regulation of the interferon regulatory factor (IRF) transcription factor family in innate and adaptive immune responses,
- The regulation of dendritic cell maturation/activation in the link between innate and adaptive immunities,
- The molecular mechanisms of protective and pathological immune responses mediated by nucleic acid sensor proteins,
- The regulation of oncogenesis by IRFs,
- The regulation of mucosal immune responses.



Intracellular localization pattern of DAI (DLM-1/ZBP1) and its interaction with B-DNA



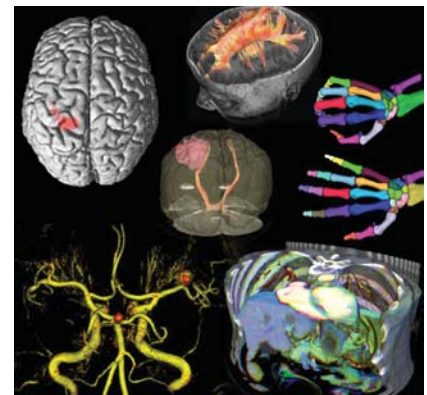
Radiology and Biomedical Engineering

Radiology

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

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 16 rows) helical computed tomography
 - MR imaging, MR digital subtraction angiography, perfusion imaging, and diffusion tensor imaging/tractography
- 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 and metabolism by emission tomography (PET and SPECT)



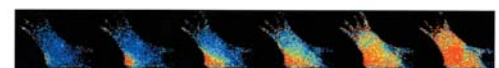
Representative images analyzed with computer-assisted technology

System Physiology

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

A variety of living cells respond to mechanical forces occurring both inside and outside a body. We have been pursuing biomechanical research focusing on the effects of shear stress generated by flowing blood on vascular cells and circulatory functions. Our analyses range all the way from genes to whole organs and systems. Research on the molecular mechanism of arterogenesis and biomechanical tissue engineering is also ongoing.

- Vascular cell responses to shear stress
- Identification of flow-sensing molecules
- Mechanical stress responsive genes
- Tissue engineering using mechanical stresses
- Atherosclerosis research from the aspect of hemodynamics
- Vascular system physiology
- Microcirculation study using optical imaging



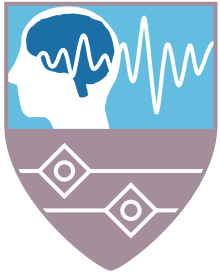
Mechanical force-loading apparatus and calcium response in vascular cells

Our research fields include medical engineering high-technologies represented by artificial organs. Especially the research of artificial heart has gotten excellent results such as the world longest survival record in animal replaced with a total artificial heart. We are performing the researches from the basic to the application.

- Implantable total artificial heart
- Implantable ventricular assist device
- Polymer artificial valve
- Next generation artificial lung
- Tissue engineered artificial organs
- Blood compatible material
- Implantable pressure sensor
- Implantable angiogenesis observation probe
- Space medicine1



Implantable total artificial heart (Undulation pump total artificial heart) and artificial heart animal (goat)

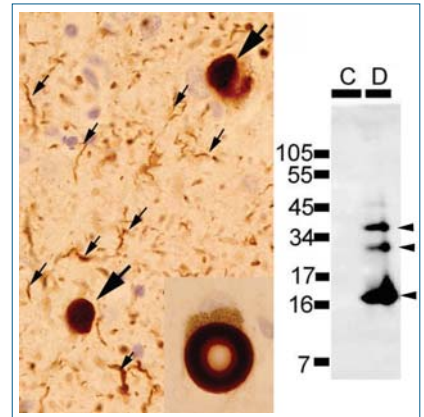


Neuroscience

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 γ -secretase
- Molecular analysis of the mode of action of γ -secretase inhibitors
- Mechanism of A β production, aggregation and clearance
- Pathological function of β -amyloid binding proteins (e.g., CLAC)
- Mechanism of aggregation and neurotoxicity of α -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)



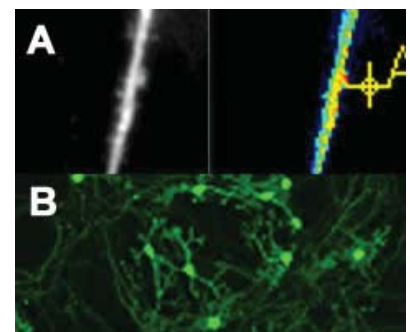
Phosphorylated α -synuclein deposited in Lewy bodies of Parkinson's disease and Lewy body disease

Neurochemistry

<http://www.neurochem.m.u-tokyo.ac.jp/Homepage.html>

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.

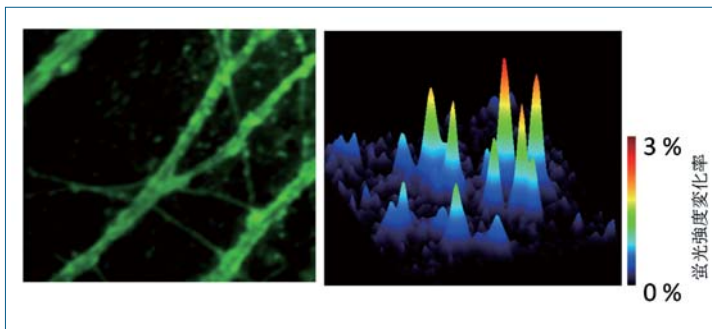
- Molecular investigation (including identification, characterization and real-time visualization) of signaling molecules involved in calcium-dependent synaptic modification, especially during signaling from synapse-to-nucleus, and back from nucleus-to-synapses
- Understanding molecular mechanisms controlling cytoskeletal dynamics and remodeling on both sides of the synapses, in the dendritic spines and in axon terminals



Real-time measurement of biochemical events triggered by glutamate uncaging at hippocampal spines (A); Visualization of actin cytoskeleton in cerebellar Purkinje cell dendrites (B)

The goal of our research is to elucidate regulation mechanisms of various cell functions. Toward this goal, we have been developing novel technologies including live cell imaging and RNAi technologies.

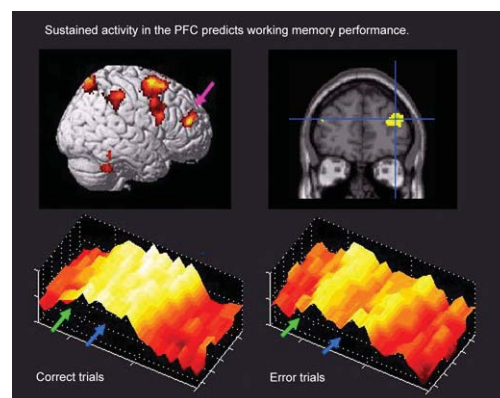
- Development of novel strategy for generating fluorescent probes for live cell imaging
We develop a high-throughput screening system for constructing high performance fluorescent probes for live cell imaging.
- Study of synapse physiology by glutamate imaging technique
To clarify the dynamics of exocytosis in excitatory synapses, we have tried to quantitatively analyze released glutamate at individual synapses by using our original optical glutamate probe.
- Novel technology for construction of genome-wide RNAi library
We are currently constructing a high performance genome-wide RNAi library based on our EPRIL technology.



Cognitive Neuroscience

We are trying to understand the neural mechanisms of human cognition using functional MRI, EEG and TMS.

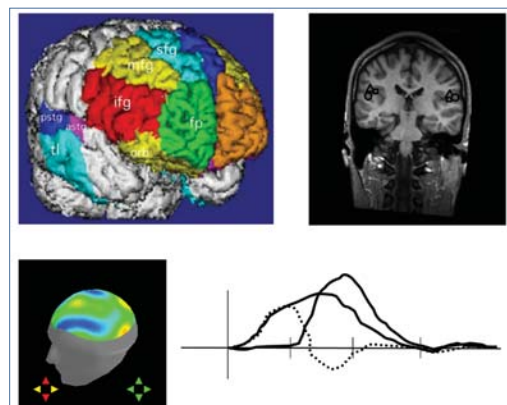
- Working memory and cognitive control
- Attention, perception and consciousness
- Mind-reading and prediction of behavior



Neuropsychiatry

Our department mainly investigates schizophrenia and pervasive developmental 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.

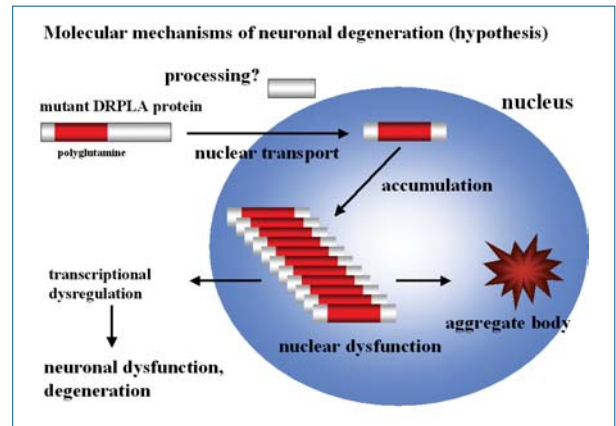
- Integrated Neuroimaging studies in Schizophrenia Targeting Early intervention and Prevention
<http://plaza.umin.ac.jp/arms-ut/>
- Todai Twin Project with Integrative Neuroimaging
<http://npsy.umin.jp/study/exam.html>
- Multimodal neuroimaging studies of pervasive developmental disorders
- Clinical 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

Our Department is promoting research programs to elucidate the pathophysiological mechanisms of neurological diseases including neurodegenerative diseases, immune-mediated diseases and neuromuscular diseases, and to establish therapeutic approaches for these diseases. We are also providing excellent programs to train neurologists.

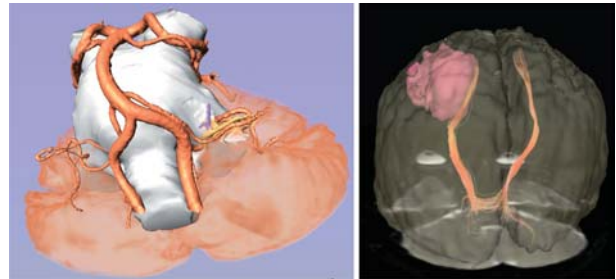
- Molecular Genetics (identification of disease genes and development of therapeutic approaches)
- Molecular pathophysiology of neurological diseases (RNA editing, and protein structures)
- Immune-mediated diseases (autoantibodies)
- Neuropysiology and cognitive neuroscience (magnetic stimulation, NIRS,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



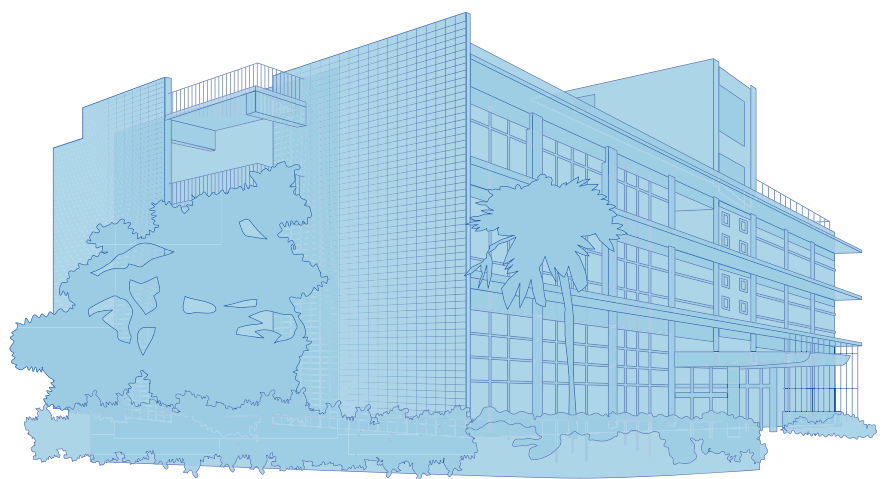
Neurosurgery

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
- 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



Simulation images using 3D-fusion images and tractography.





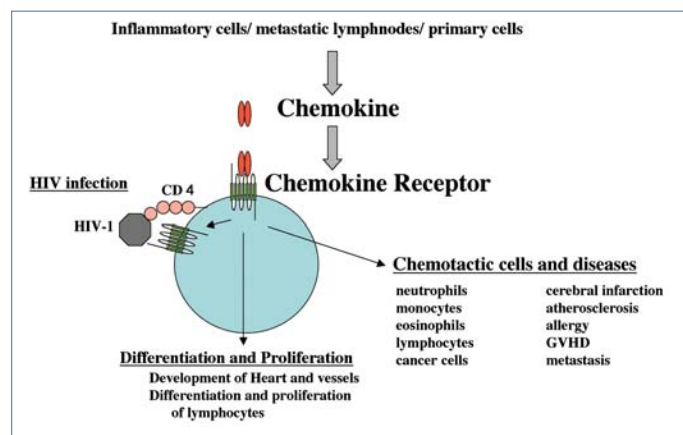
Social Medicine

Molecular Preventive Medicine

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

Chemokines play critical roles in the pathogenesis of diseases including acute inflammation, autoimmune diseases, allergic diseases, HIV infection, atherosclerosis and tumor metastasis through the regulation of chemotaxis, activation and differentiation. We hope chemokine research will contribute to Molecular Preventive Medicine.

- Pathogenesis of diseases by chemokine
 - Autoimmune diseases, liver injury, GVHD
 - Atopic dermatitis, bronchial asthma
- Activation of the chemokine receptor and its signal transduction
- Serial analysis of gene expression (SAGE) for hematopoietic cells
- Development of vaccinations to cancers and infectious diseases



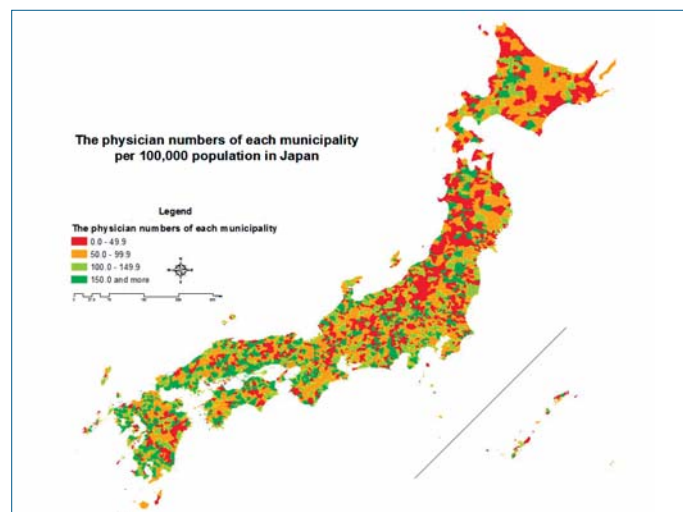
Public Health

<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 services
- Health manpower policy
- Occupational and environmental health
- Policy analysis on health and environmental issues
- Clinical epidemiology (QOL, outcome studies, economic evaluation)

Physician distribution by municipality in Japan



We determine the cause of death in unnatural deaths through autopsy and various examinations. We also study on legal-social systems related to death investigation, patient safety, and court. To improve death investigation and related systems, we conducted variety of researches including cardiovascular basic sciences, legal-social medicine, toxicology, DNA polymorphism, and forensic pathology.

- Involvement of Gap Junction in myocardial injury in ischemic heart disease and arrhythmogenesis in restraint
- Arrhythmogenesis and contractile dysfunction in pressure overload
- Legal-social systems related to death investigation, patient safety, and court
- Improvement of toxicological and DNA examinations
- Forensic pathology



Forensic autopsy room

Medical Informatics and Economics

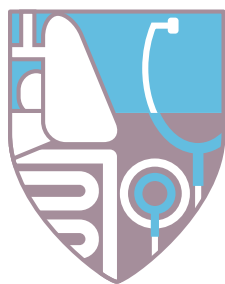
http://www.m.u-tokyo.ac.jp/medinfo/index_e.html

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



Computer room of the hospital computer center



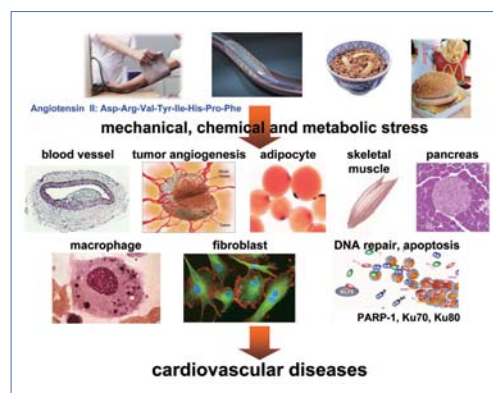
Internal Medicine

Cardiovascular Medicine

<http://plaza.umin.ac.jp/~utok-card/>

We are investigating the pathogenesis, pathophysiology, diagnostic methods, and novel therapeutic measures of various cardiovascular diseases (ischemic heart disease, heart failure, cardiomyopathy, arrhythmias, atherosclerosis, hypertension, etc.) using a variety of research tools (from molecular biology to epidemiology, bioinformatics).

- Transcriptional regulation of various genes in cardiovascular development and pathogenesis
- Cardiac hypertrophy and heart failure: analyses of pathogenic mechanisms and developments of novel therapies (gene therapy, etc.)
- Immunological basis of cardiovascular diseases
- Imaging techniques (echocardiography, MRI, CT, RI, NOGA) in cardiovascular diseases
- Mechanisms of anti-arrhythmia therapy
- Molecular mechanisms of ischemia-reperfusion injury
- Genetic polymorphisms and risk factors in cardiovascular disease
- Differentiation of smooth muscle cells (atherosclerosis and restenosis after vascular interventions)
- Mouse genetic models of cardiovascular diseases and vascular development
- Neurohumoral factors in cardiovascular diseases

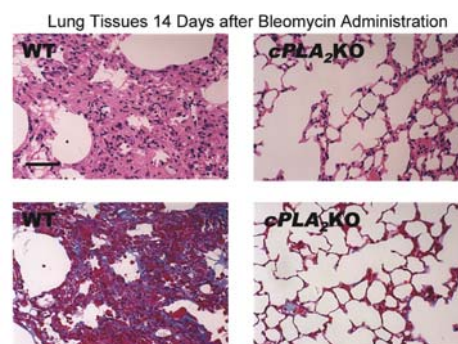


Respiratory Medicine

<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 21st 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
- Effects of air pollutants such as diesel exhausts on airway hyperresponsiveness
- Roles of chemokines/cytokines and eicosanoids on airway epithelial cells, smooth muscle cells and eosinophils.
- DNA methylation and lung cancer
- Establishment of conditional vectors for hairpin siRNA knockdowns
- Establishment of CpG island searcher



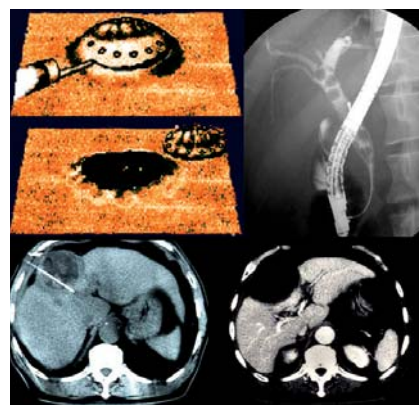
Murine model of pulmonary fibrosis

Gastroenterology

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

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*
- Clarification of colon disease, especially right-sided colon carcinogenesis
- 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

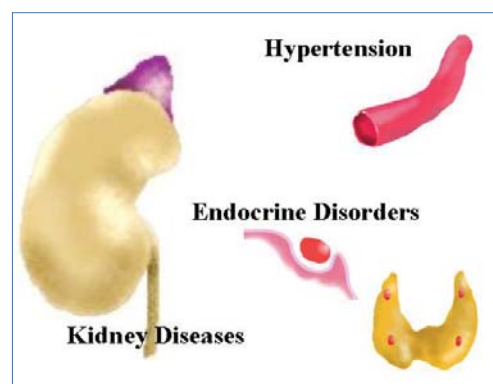


Nephrology / Endocrinology

<http://plaza.umin.ac.jp/~kid-endo/top.html>

We are investigating the pathophysiology of renal and endocrine disorders for the development of innovative diagnostic and therapeutic tools. Hypertension is our special interest because not only it is a serious medical problem which impairs many vital organs and the QOL of our patients, but also we have the great advantage of organizing the strategic research approach since hypertension is closely related to both nephrology and endocrinology.

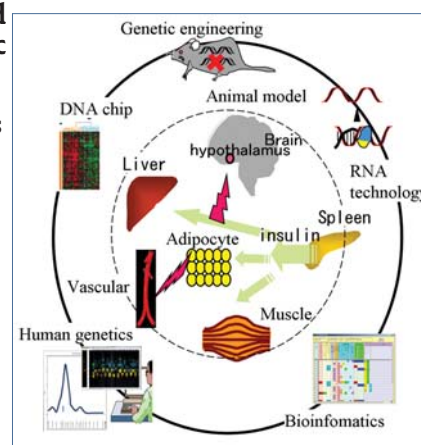
- Renal physiology and morphology
- Pathophysiology of immune-mediated renal injury
- Analysis of pathophysiology and prognostic factors of chronic renal failure
- Endothelial injury and vascular biology in kidney disease
- Role of nitric oxide and oxidative stress in renal disease and hypertension
- Clinical and basic investigation of bone and mineral disorders
- Mechanism of action of nuclear hormone receptors
- Pathophysiology of hypertension and roles of adrenomedullin
- G protein signaling in health and disease



Nutrition and Metabolism

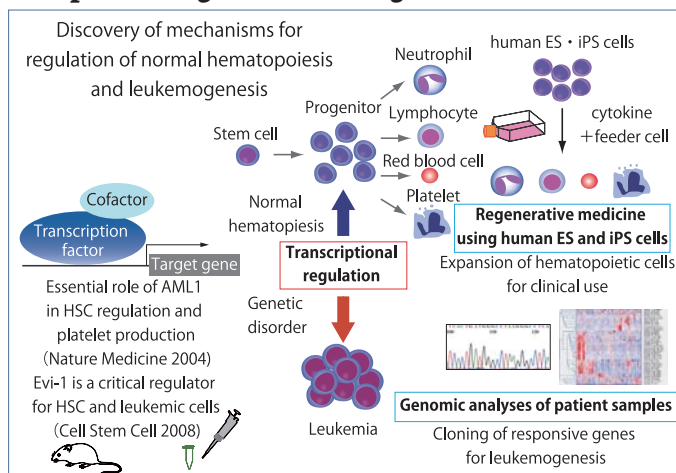
We are investigating to reveal the molecular mechanisms underlying the development of metabolic diseases (diabetes mellitus, lipid metabolic disorders, obesity, metabolic syndrome and atherosclerosis) using interdisciplinary approaches and state-of-the-art technology including genetically engineered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

- Molecular mechanism of insulin resistance linked to obesity focusing on adipokines
- Transcriptional regulation of insulin resistance and obesity by nuclear receptors and cofactors
- 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



We are investigating the pathogenesis, diagnostic methods, and novel therapeutics of hematological disorders by making comprehensive use of research technologies in molecular biology, developmental biology, and immunology. Studies about transcriptional regulation and signal transduction in hematopoiesis and analyses of regulation of hematopoietic stem cells are performed. We are also performing basic and clinical studies based on genomics, regenerative medicine, and transplantation medicine, which aim at application to therapeutic strategies.

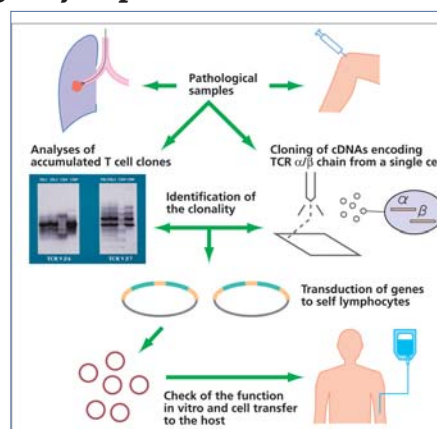
- Self renewal and differentiation of hematopoietic stem cells
- Genome-wide analyses of hematological malignancies
- Identification of molecular pathogenesis of leukemia
- Analyses of the immune system by developmental biology
- Regenerative medicine of hematopoietic cells using human ES and iPS cells



Allergy and Rheumatology

Allergy and rheumatic diseases are immune mediated disorders. We are investigating the fine mechanisms of such disorders. One of our final purposes is to establish novel therapies which control pathological immune disorders but do not suppress other physiologically important immune functions. We are combining recent findings in basic immunology and our own viewpoints base on our clinical experience.

- Clonal analyses of T cell receptor (TCR) , *in vitro* reconstitution of the TCR function using such information and antigen specific immunotherapy
- Mechanisms of oral tolerance and application to therapeutic strategies
- Mechanism of immunological tolerance to autoantigens and immunoregulation
- Development and induction of regulatory T cells and their applications
- Intracellular signaling in immune disorders
- Genomic analyses of rheumatic diseases
- Development of molecular targeting immunosuppressive reagents
- Airway hypersensitivity and remodeling of bronchial asthma
- Mechanisms of IgE mediated allergic disorders and applications for therapies
- Involvement of chemokines in allergic diseases and applications to therapeutic strategies

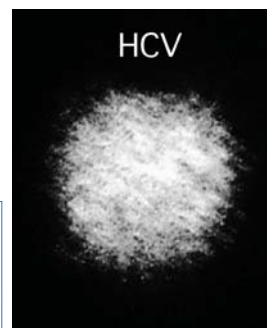
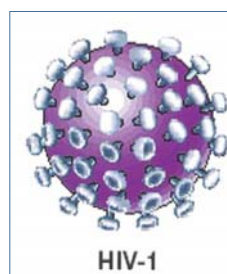


Clonal analyses of T cell receptor (TCR) and *in vitro* reconstitution of the TCR function for an antigen specific immunotherapy

Infectious Diseases

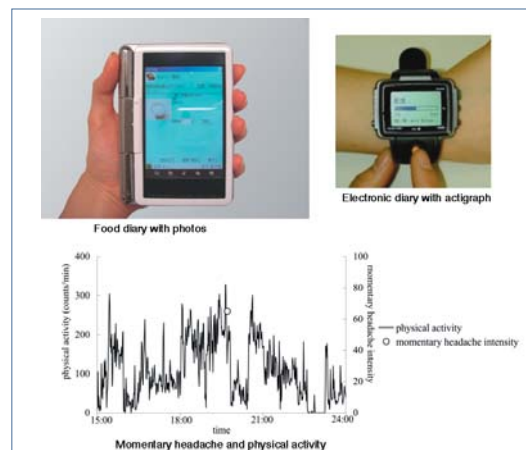
We are investigating both clinical and basic aspects in infectious diseases, in particular, on HIV infection and hepatitis viral infections, the latter of which is the major cause of liver disease worldwide. Our research topics cover the wide areas in microbiology, immunology and pathobiology of infectious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

- Clinical studies of HIV infection
- Development of new methods in infection control and treatment 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 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



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.

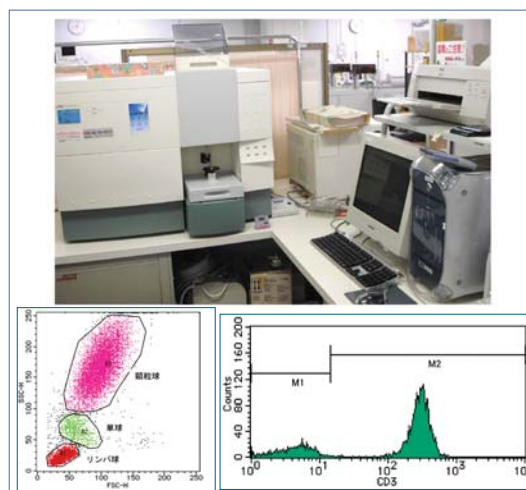


Clinical Laboratory Medicine

<http://lab-tyk.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.

- Elucidation of (patho)physiological roles of lysophospholipid mediators, and its application to laboratory medicine
- Platelet biology, Hepatology
- Genetic testing
- Research on bioactive peptides, especially adrenomedullin
- Oxidative stress and organ damage
- Cell surface analysis and quantification of cell surface antigens using flow cytometry
- Analysis of the ventricle functions using ultrasound
- Relationship between the respiratory function and various pathophysiological conditions
- Magnetoencephalographic (MEG) study on neural mechanisms for audiovisual integration

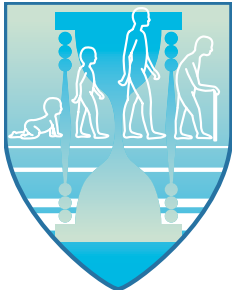


Transfusion Medicine

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

Control, testing and supply of all blood products for transfusion are the main clinical activities of the department of transfusion medicine, which is responsible for the provision of safe blood products and the control of the transfusion practice in the hospital. It actively takes part in autologous blood collection, preservation, and supply for patients receiving routine surgery. In addition, apheresis procedures for collection of peripheral blood stem cells for transplantation, and of peripheral blood mononuclear cells for dendritic cell-based vaccine therapy of cancer patients are performed. Also, lymphocyte-based vaccine is prepared for the immunotherapy of recurrent abortion cases. Special laboratory testings, including HLA typing (serologic and DNA-based) for bone marrow and organ transplantations and the detection of anti-HLA, anti-platelet (HPA) and anti-granulocyte antibodies, as well as the phenotyping and genotyping of platelet- and granulocyte-specific antigens for patients with adverse reactions after transfusion, are performed. The research fields include 1) the development of immunological methods for antigen-antibody testing of red cells, lymphocytes, granulocytes, platelets and endothelial cells, 2) the development and clinical application of dendritic cell-based and other vaccines for immunotherapy of cancer, and 3) the development of new anti-thrombotic materials for clinical use.

- Detection of platelet alloantigens and alloantibodies / • Detection of leukocyte alloantigens and alloantibodies
- Detection of anti-endothelial cell antibodies and investigation on their clinical relevance
- Development of a novel method for the evaluation of platelet function
- Dendritic cell-based immunotherapy for malignant diseases
- Development of new anti-angiogenic strategies to treat cancer
- Development of new immunotherapeutic approaches to treat malignant diseases
- Development of new anti-thrombotic materials for clinical use / • Use of stem cells in regenerative medicine



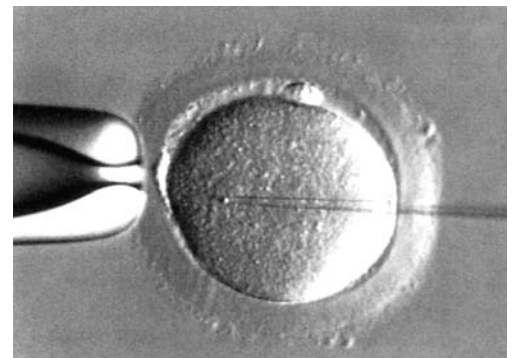
Reproductive, Developmental and Aging Sciences

Reproductive Endocrinology

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

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
- Interaction between the endometrium and embryo during the implantation period
- Pathophysiology of endometriosis
- Local regulation of folliculogenesis
- Technical development of advanced endoscopic surgery
- Development of hormone replacement therapy for postmenopausal women
- Medical treatment for menopausal women



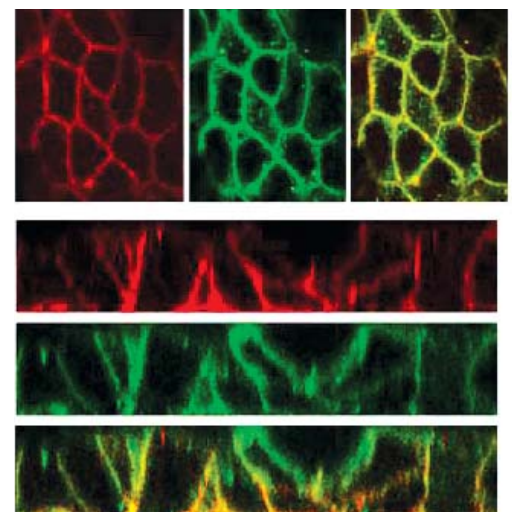
ICSI (intracytoplasmic sperm injection)

Gynecological Oncology

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

We are developing the intensive surgical management and selection of the most suitable chemotherapy regimen, which improved prognosis of the patients with ovarian cancer. The basic researches are focusing on the mechanism of gynecological malignancies, especially cervical cancer. We have identified the tumor suppressors involving in the process of cervical carcinogenesis. We are investigating a possible clinical application of the vaccine against human papillomavirus, which is a causative agent of cervical cancer.

- Intensive surgery including pelvic and paraaortic lymphadenectomy
- Selection of adjuvant chemotherapy based on the pathological and molecular marker
- Tumor suppressors involving carcinogenesis of gynecological malignancy
- Analysis of the molecular marker in tumor cells related to clinical behavior
- Prevention of cervical cancer using the human papillomavirus vaccines



Expression of tumor suppressor scribble in malignant cells

The researches are on going for development of precise prenatal diagnosis on the fetal status using ultrasonography. We are also focusing on the immunological aspects in patho-physiology of pregnancy, developing the therapy for habitual abortion or pregnancy induced hypertension.

- Early diagnosis of abnormal pregnancy
- Development of three dimensional ultrasonography
- Management of habitual abortion
- Management of complicated pregnancy

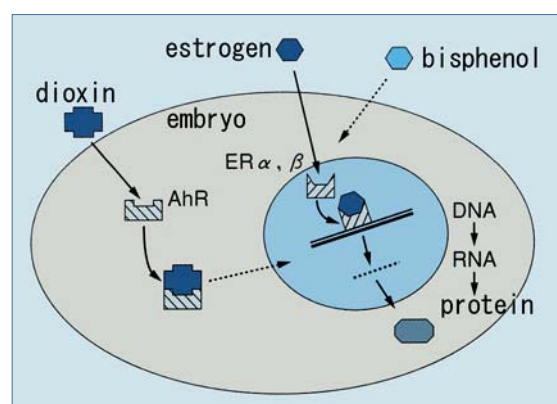


Three dimensional ultrasonography of fetus

Molecular Cellular Reproductive Medicine

We are approaching the molecular mechanisms in various reproductive pathological states, using the knowledge and techniques of molecular biology, cellular biology and genetics. The studies are proceeding on the effects of endocrine disruptors on reproductive phenomena, such as embryogenesis, spermatogenesis and fetal development, and on the prenatal genetic diagnosis.

- Effect of endocrine disruptors on reproduction
 - Embryogenesis
 - Spermatogenesis
 - Intrauterine fetal development
- Prenatal diagnosis using molecular genetics
- Molecular mechanisms of embryonic development



Molecular mechanisms of endocrine disruptors

Pediatrics / Developmental Pediatrics

We are studying all the issues concerning the health of infants, children and adolescents. We have achieved very important investigations to clarify the molecular pathogenesis of human congenital disorders.

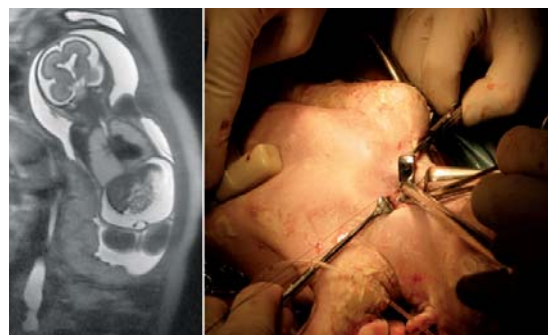
- Molecular diagnosis and analysis and collaborative treatment of intractable renal glomerular and tubular diseases
- Molecular diagnosis and analysis of hematological malignancy and bone marrow transplantation
- Study of Embryonic stem cell (ESC) treatments for various human congenital diseases
- Diagnosis, molecular analysis and collaborative treatment of congenital heart diseases
- Molecular analysis and collaborative treatment of congenital immunodeficiency and allergic diseases
- Collaborative treatment of extremely premature neonates and babies with pulmonary hypoplasia
- Enhancement of the immunological resistance of premature neonates using a new type of lactobacillus
- Diagnosis and treatment of neurological, endocrine and metabolic diseases
- Collaborative study and treatment of psychological disorders
- Investigation of new systems to promote mother and baby co-relationships during rearing



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.

- The development and differentiation of the fetal lung
- Fetal diagnosis of congenital malformations
- Fetal surgery and treatment
- Pediatric minimally invasive surgery
- Probiotics and prebiotics applied to pediatric surgical patients
- The development and differentiation of intestinal lymphoid organs
- Renal functions in congenital hydronephrosis
- Biliary atresia and biliary dilatation: their treatment and long-term prognosis
- The treatment by regenerative medicine of air way malacia and stenosis

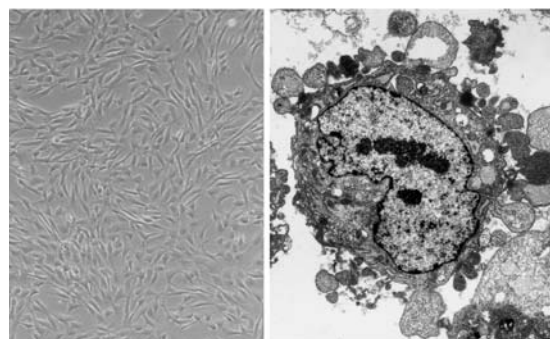


EXIT(ex utero intrapartum treatment):Tracheostomy on a fetus with laryngeal atresia

Pediatric Oncology

Solid tumors in children are dealt with in our department. Appropriate care strategies combining surgical treatment and chemotherapy are decided and carried out on various malignant tumors after extremely close discussion with pediatric oncologists.

- Genetic analysis and investigations for prognostic factors in neuroblastoma
- Tumorigenesis in Wilms tumors
- Analysis of cellular biology in Wilms tumors
- Treatment of rhabdomyosarcoma
- Genetic mutation in hepatoblastoma



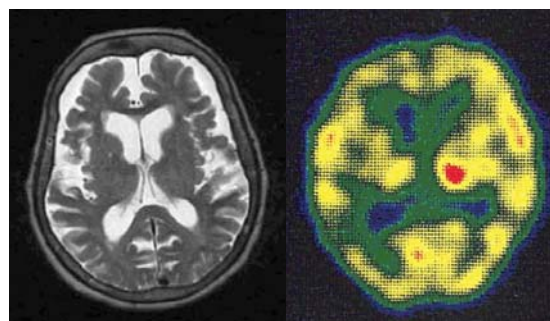
Microscopic and ultramicroscopic features of Wilms tumor cell line

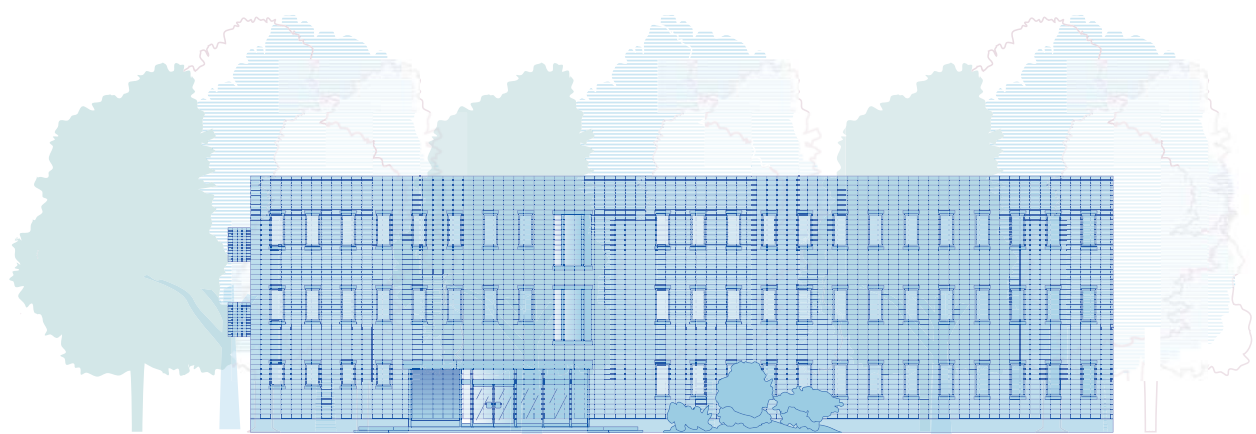
Geriatrics

<http://www.h.u-tokyo.ac.jp/patient/depts/1510rounenbyou.html>

Our department is the first established department of Geriatric Medicine in Japan. It is our goal to treat all the geriatric diseases, such as atherosclerosis, hyperlipidemia, osteoporosis, senile dementia, diabetes, COPD, and aspiration pneumonia, and to improve the quality of life of elderly patients.

- Vascular endothelial function and atherosclerosis
- Studies of molecular mechanisms in vascular calcification
- Antioxidants inhibit vascular smooth muscle cell proliferation and induce apoptosis
- Vascular gene therapy using adenoviral mediated gene transfer of estrogen receptors
- New guidelines for hormone replacement therapy in females in Japan
- Novel gene responsible for breast cancer
- Novel gene responsible for osteoporosis
- Molecular cloning of novel Ring finger protein
- Studies of pathophysiology and novel treatment for Alzheimer's disease
- Pathophysiological studies on bronchial asthma using gene-targeted mice
- The antimicrobial peptide, defensin
- The molecular mechanisms of vascular injury in sleep apnea syndrome







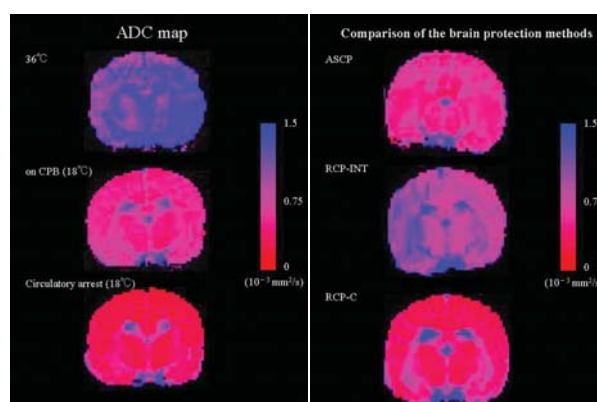
Surgical Sciences

Cardiovascular Surgery, Thoracic Surgery

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

We are leading in Japan by annual surgery case volume of 700. 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
 - Brain and spinal cord protection in thoracic aortic surgery
 - Minimally invasive cardiac and thoracic surgeries
 - Valve or vascular tissue allograft transplantation
 - Ventricular assist device for end-stage heart failure
 - Pathophysiology of thymic epithelial neoplasms
- Basic and experimental research
 - Development of myocardial regeneration therapy
 - Analysis of resistance to infection of tissue allograft
 - Analysis of suppressor gene of lung cancer



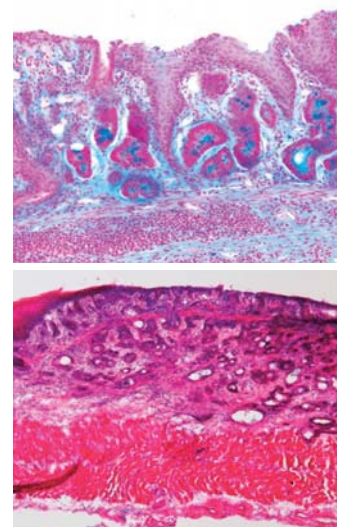
MRI diffusion-weighted images of brain by various brain perfusion techniques

Gastrointestinal Surgery

<http://todai3ge.umin.jp/>

Our research activities range from basic topics to clinical ones with close inter-connections. Basic research topics encompass underlying molecular mechanisms and the regulation of carcinogenesis, progression, metastasis and prevention of gastrointestinal cancer. Clinical research topics include the establishment of tailored treatment strategies from a patients-by-patient point of view, which ultimately provide a better quality of life while improving survival quality.

- Carcinogenesis, progression, metastasis and prevention of gastrointestinal cancer
 - Inflammation and gastrointestinal carcinogenesis (gastroduodenal reflux, H. pylori infection)
 - Are cancer cells derived from bone marrow?
 - Earlier detection of cancer and micrometastasis by new genetic markers
 - Roles of epigenetic alteration (DNA methylation) in gastrointestinal carcinogenesis
 - Carcinogenic analysis with murine esophageal reflux model
- Establishment of tailored treatment strategies
 - Less invasive treatment of early cancer by laparoscopic (assisted) surgery
 - Sentinel node navigation surgery for early cancer
 - Extended radical treatment of advanced cancer
 - Induction of neoadjuvant chemotherapy and improvement of survival
 - Estimation of chemotherapy effects by new bio- and genetic-markers
 - Alternative gastrointestinal reconstruction and estimation of the results



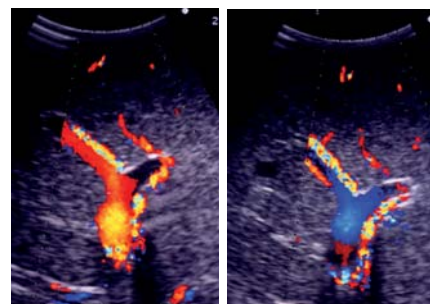
Barrett's esophagus and Cancer in reflux model mouse

Hepatobiliary Pancreatic Surgery

<http://square.umin.ac.jp/hbp-t/index21.htm>

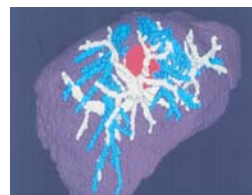
We constantly perform nearly 200 hepatectomies every year on patients with hepatobiliary malignancies including hepatocellular carcinoma and metastatic liver tumors. The surgical results can be classified as amongst the highest ranking in the world. In order to improve the surgical outcome for hepato-biliary-pancreatic 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 development of a radical and safe operative procedure for hepato-biliary malignancies
- 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
- Study of the effect of ischemic preconditioning on liver normothermic ischemia/reperfusion



Color flow mapping of intraoperative Doppler ultrasonography before division of the middle hepatic vein. Portal flow was hepatopetal (shown in red).

Color flow mapping of intraoperative Doppler ultrasonography after transection of the middle hepatic vein. Portal flow was hepatofugal (shown in blue) in the veno-occlusive area.



Preoperative 3-D image of the liver constructed by simulation software. Accurate anatomy of vasculature and tumor location is analyzed.

Urology

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

We constantly perform more than 1,400 urological surgeries a year, including nephrectomy, cystectomy and prostatectomy, with increasing trend of laparoscopic maneuvers and brachytherapy for organ confined prostate cancer. Surgical or Non-surgical means are employed for non-cancer diseases including renal transplantation, urinary dysfunction, urinary incontinence, urolithiasis and male infertility. With regard to laboratory research, not only oncology but also JC virus, PCK disease and vascular biology are now under extensive investigation.

- Tailor medicines on estramustine phosphate (EMP) has been investigated for newly diagnosed advanced prostate cancer (Fig.1)
- JC viral genomic analyses and its distribution in the world
- Estrogen receptor beta and its metabolic cascade analysis
- Hormonal regulation of prostatic proliferation and atrophy
- Human E&H-cadherin correlation with invasiveness of transitional cell carcinoma and prostate cancer
- Oncolytic viral therapy using HSV-1 (Fig.2)
- PCK disease and genetic analysis
- Urolithiasis: ion channels membrane transport (NaDC-1)
- Vascular biology and erectile dysfunction (ED)
- Fluorescence in situ hybridization (FISH) flow cytometry
- Immunotherapy for renal cancer by IL-2 blocking with anti-IL-2-mAb

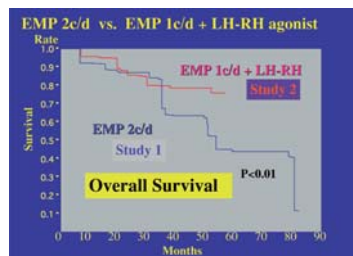


Fig.1 Overall Survival; EMP 2Cp versus EMP 1Cp + LH-RH agonist

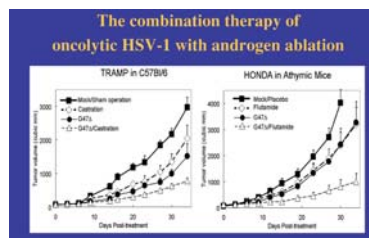


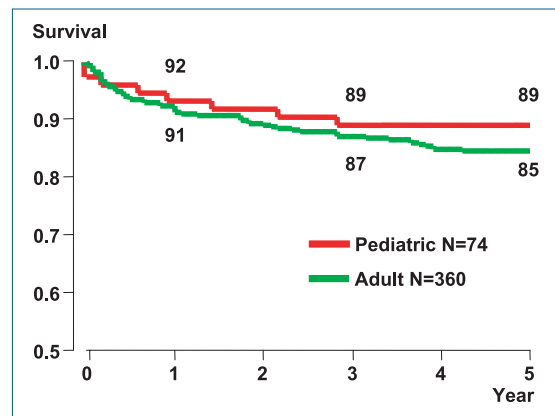
Fig. 2 The combination therapy of oncolytic HSV-1 with androgen ablation led to significantly enhanced inhibition of the tumor growth.

Artificial Organ and Transplantation Division

<http://www.h.u-tokyo.ac.jp/patient/depts/1512ishokugeka.html>

We are doing the clinical studies about liver transplantation for end staged liver diseases. We have performed 434 living donor liver transplantation and 9 deceased donor liver transplantation until June, 2009.

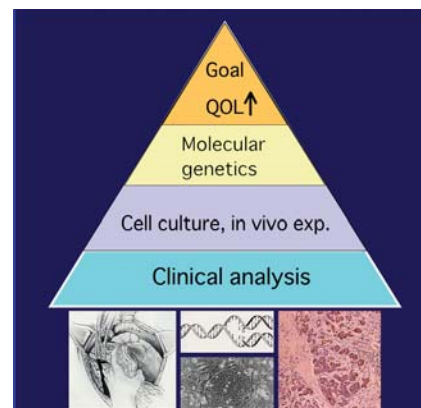
- Surgical technique of liver transplantation
- Diagnosis and treatment of acute rejection
- Diagnosis and treatment of postoperative infection



The 5-year survival rate for adult cases was 85%, which is significantly superior to that of the national data (70%)

We had a great deal of experience in treating patients with various cancers and vascular diseases, and we have performed much research on carcinogenesis, cancer metastasis, immunology, 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 the novel and order-made therapy for cancer
 - Genetic mutation analysis of various cancers
 - Radiosensitivity and chemosensitivity of cancer
 - Intraperitoneal chemotherapy for peritoneal carcinomatosis
 - Immunotherapy using dendritic cells
 - Characterization of tumor vasculature and its therapeutic application
 - Gene therapy for disseminated metastasis
 - Drug development to target the receptor and signal transduction cascade of bioactive lipids
- Development of a novel method to diagnose and treat the vascular diseases
 - Vascular regeneration therapy for atherosclerotic obliterans (ASO)
 - Visualization of atherosclerotic lesions
 - Robotics surgery for vascular diseases



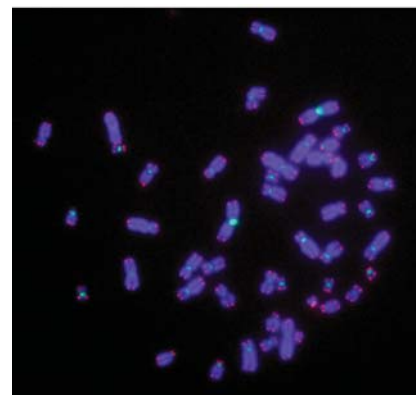
Diagrammatic representation of clinical-oriented research, with the ultimate goal of improving patient QOL

Metabolic Care and Endocrine Surgery

<http://todai3ge.umin.jp/>

Our department has two main divisions. Division of surgical metabolism and nutrition performs research on vital response to surgical stress and on metabolic and nutritional care during peri-surgical period. Division of breast and endocrine surgery performs surgery for 230 cases of breast, thyroid and parathyroid tumors a year, and performs research on tumorigenesis, establishment of treatment and prevention of breast and thyroid cancers.

- Surgical metabolism and nutrition
 - Induction of tolerance against surgical stress and endotoxemia
 - Response to endotoxemia through Toll-like receptors
 - Effects of surgical stress on tumor development
 - Gender difference in the response to surgical stress
 - Bacterial translocation during chemotherapy for cancer
 - Establishment of metabolic care and nutritional support team
- Breast and endocrine surgery
 - Roles of nuclear receptor in development of breast cancer
 - Micrometastasis of breast cancer
 - Diagnosis of breast and thyroid tumors by fluorescence in situ hybridization of telomere
 - Expression of insulin-like growth factor 1 receptor in breast cancer tissue as prognostic factor
 - Roles of carbohydrate in breast cancer metastasis
 - Establishment of evaluation on QOL of the patients with breast cancer



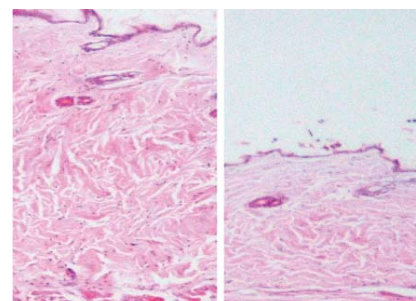
Detection of telomere and centromere by FISH. Fluorescence volume of telomere attenuates with increase of cell division. (red: telomere, green: centromere, blue: chromosome)

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

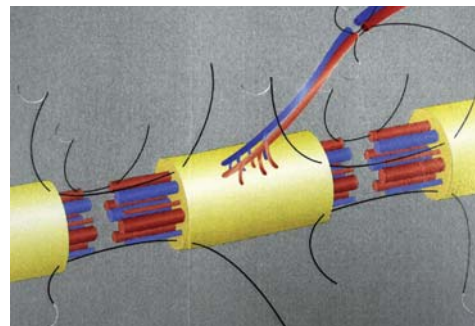


Skin fibrosis induced by bleomycin(left) is inhibited in CD19-deficient mice(right)

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
 - Mechanisms of embryonic craniofacial morphogenesis
 - Angiogenesis in embryo and vascular malformations
 - 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
 - Esthetic microvascular surgery
 - Mechanism and surgical treatments of lymphedema
 - Vascularized ovarian preservation and transplantation
 - Free vascularized transfers of nerve cells, muscle cells, adiposal cells, and lymphnodes



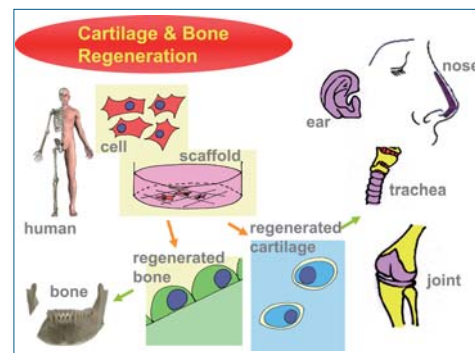
Supermicrosurgical vascularized nerve graft. 100% of Schwann cells within a nerve graft can survive with microvascular anastomosis(0.5mm).

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:
 - Correction of facial deformity in patients with cleft lip and palate
 - Facial growth in craniofacial anomalies
 - Surgical-orthodontic treatment of dentofacial deformities
 - Evaluation of the treatment outcomes in patients with cleft lip and/or palate
 - Clinical application of artificial bone that displace into bone
 - Implant type artificial bone generated from tissue engineered human chondrocyte
- Basic and experimental research:
 - Cartilage and bone regeneration using the tissue engineering technique
 - Gene analysis of congenital anomalies in the oral and maxillofacial region
 - Effect of free radicals on bone metabolism
 - COX-2 regulation on bone metabolism
 - Development of intelligent type of artificial bone invested with osteogenic differentiation factors
 - Development of tetra pod type micro artificial bone unit



Cartilage and bone regeneration using the tissue engineering technique

Orthopaedic Surgery

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

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.

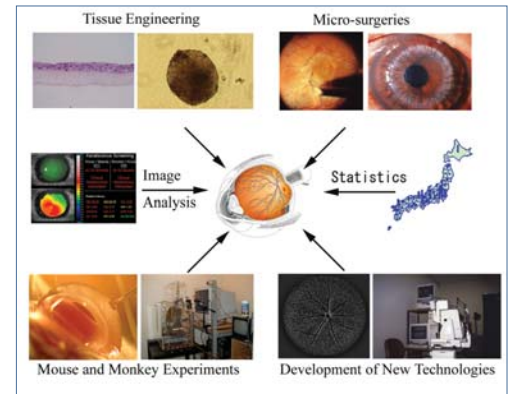
- Systemic and comprehensive study for osteoarthritis
- Bone, cartilage and nerve regeneration
- Regulation of anabolic and catabolic bone metabolism by cytokines
- Molecular mechanism of age-related bone loss
- Molecular mechanism of osteoclast differentiation and apoptosis (RANKL-RANK, INF, Src)
- Gene therapy to control pathological bone destruction (arthritic bone resorption and arthritic joint destruction) using adenovirus vectors
- Non-invasive analyzing system to evaluate the mechanical properties of skeletal system *in vivo* using CT based finite element analyses
- Surgical navigation system with a three-dimensional display and navigation robot



Surgical navigation system

Our department applies cutting-edge technologies and knowledge to diagnosis and treatment of eye diseases. To elucidate pathogenesis and establish more efficient ways of diagnosis and treatment of various refractory eye diseases, basic researches utilizing molecular biological, immunological and/or pharmacological techniques and clinical studies utilizing epidemiological, biostatistical and/or optical methods are conducted. Our efforts are also dedicated to regenerative medicine of the cornea and retina.

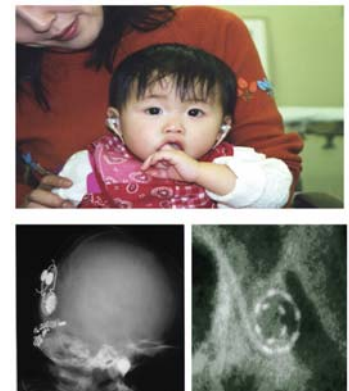
- Investigation of primary glaucomas and relating factors
- Development of new methods of glaucoma treatment and validation by RCT
- Investigation of new ocular hypotensive drugs and their mechanism of action by using transgenic or KO mice or experimental glaucoma monkeys
- Investigation of mechanism of neural cell death by using cultured RGCs or retinal glial cells and exploratory search for new neuroprotective agents
- Analysis of ocular circulation in glaucoma and retinal diseases
- Analysis of corneal topography and wave-front analysis of optical aberrations
- Development of tissue-engineered cornea by using cultured stem cells of corneal endothelium and epithelium
- Investigation of molecular mechanism of choroid-retinal neovascularization and new drug delivery system for it utilizing nanotechnology
- Regenerative medicine of the retina using retinal stem cells
- Investigation of immune responses in rejection of transplanted cornea and role of chemokines and receptors in uveitis



Otorhinolaryngology and Head & Neck Surgery

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
 - 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 epipharyngeal cancer and hypopharyngeal cancer
 - Molecular biology of differentiation and development of inner ear and olfactory epithelium
 - Origins of vestibular myogenic potential
 - Aging and regeneration of olfactory epithelium
 - Binaural hearing

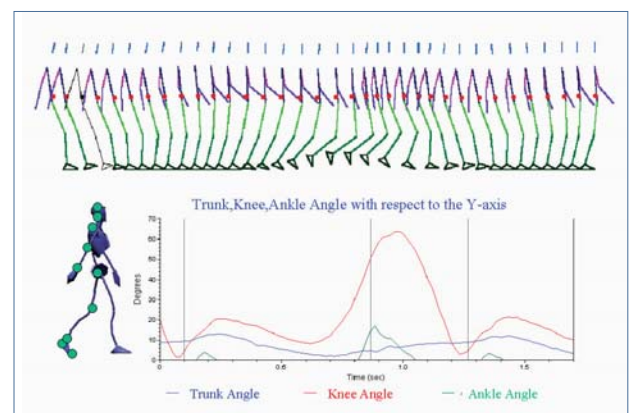


Cochlear implant

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.

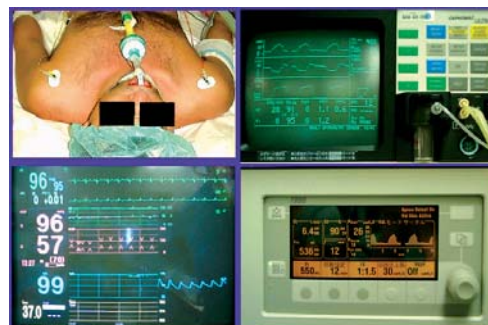
- Gait analysis
 - 3-dimensional image analysis with a infrared camera system
 - Measurements of 3 dimensional ground reaction forces with a force platform
 - Measurements of foot pressures with a computerised pressure sensor
- Clinical research on intractable rare diseases
 - Fibrodysplasia Ossificans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



Gait analysis

We conduct research into various subjects concerned with anesthesia and the pain clinic. There are 6 laboratories in our department. Comprising respiratory, circulatory, nervous and muscular, immune and pain research, and research into anesthetic instruments including monitoring systems.

- **Respiratory system** Our areas of research include changes in pulmonary vascular resistances in pulmonary edema; and influence of anesthetic drugs on the pulmonary system; and pathophysiological changes in neurogenic pulmonary edema
- **Circulatory system** Studies are now being performed on the relationship between the sympathetic nerve system and cardiac function; the influence of inhibitory enzymes upon organic microcirculations; and the ventilation-perfusion distributions during artificial positive pressure ventilation
- **Nervous and muscular system** Studies are now in progress on the mechanism of epidural-spinal anesthesia (using Hanaoka's needle); the influence of anesthetics on the auditory brain stem response; the influence of inhalation anesthetic drugs on the autonomic nervous system; and the pharmacology of neuromuscular blocking agents; and the development of a new monitoring system for neuromuscular blockade
- **Immune system** Themes include the response of immune systems to endotoxins in blood and the influences of anesthetics on hepatic Kupffer cells
- **Pain** We have performed many studies in this area, including the effects of epidural drugs on thermal nociception with different stimulus intensity; the clinical applications of current perceptive thresholds; the mechanism of the analgesic action of laser energy; the clinical applications of drug challenge tests; the examination of the application of epidroscopic therapy; the analgesic mechanism of hyperventilation; the applications of patient controlled analgesia; the effects of epidural narcotics; and the optimal combination of low dose opioids and inhaled anesthetics
- **Anesthesia machines and other medical equipment** The development of simulators for anesthetic education, and the development of new equipment for tracheal intubation are now in progress

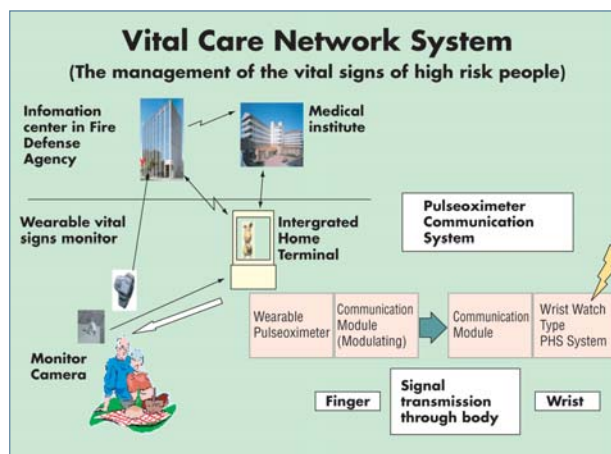


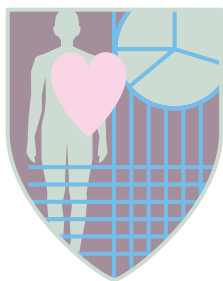
Anesthesia and monitors

Emergency and Critical Care Medicine

We are collaborating with the School of Engineering, and now concentrating on the development of the infrastructure of emergency medicine including “the Vital Care Network System”, which allows us to manage continuously large numbers of high risk patients. We are also making efforts to improve sterilization and wound healing.

- Vital Care Network System
- Telemonitoring system for prehospital medicine
- High-performance transfer system for the ambulances
- Electrolyzed water
- Autonomic nervous system regulation of the heart





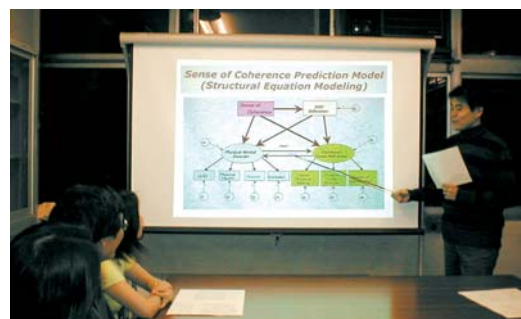
Health Sciences and Nursing

Health Sociology

<http://www.hlthsoc.m.u-tokyo.ac.jp/index.htm>

Our department studies social and psychological factors related to health problems and health care systems, through developing and applying theories, concepts and methods, which have been developed in sociology and social psychology. We carry out studies in interdisciplinary academic fields, involving health, medicine and nursing as well as the field of sociology.

- Studies on Antonovsky's Salutogenesis and Sense of Coherence (SOC)
- Study on medically infected HIV subjects
- Studies on the current situation and theories of changing professional-patient relationship and patient autonomy
- Studies on the effects of changes in industrial society on "Ways of Working and Living" and fatigue / stress among workers
- Studies on social differences and inequalities in health
- Development of health sociological researches and theories for people living with illness/stress



An example of a visual presentation on research results

Mental Health / Psychiatric Nursing

Our departments conduct research on mental health and psychosocial 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
 - Evaluation of school counseling
 - Practice and Evaluation of Psychotherapy
 - Early detection and therapeutic education of PDD
- Psychiatric Nursing
 - Supporting people living with mental health problems
 - Practice and evaluation of home visiting psychiatric nursing
 - Illness self-management in mental health
 - Recovery for people with mental illness
 - Patients' satisfaction with psychiatric services

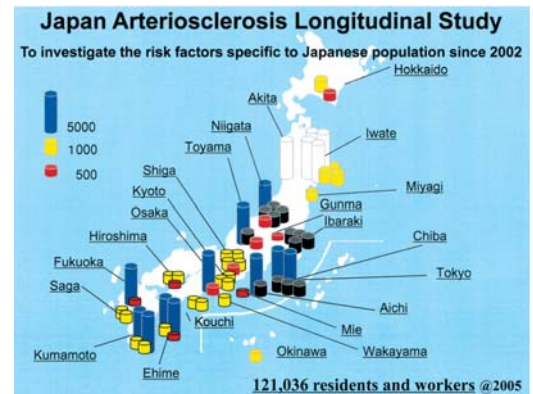


Biostatistics / Epidemiology and Preventive Health Sciences

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

Biostatistics and epidemiology provide the methodological basis for health sciences. We are conducting basic methodological research of biostatistics and theoretical epidemiology as well as consultation works and collaborative projects with basic/clinical researchers. The NPO "Japan Clinical Research Support Unit" established by the staff of the department is supporting investigator-initiated clinical trials and large-scale epidemiological studies in respect of data management, statistics and quality assurance.

- Methodological research
 - Design of clinical trials
 - Analysis of correlated data and longitudinal data such as QOL data, multiple recurrence (events) data
 - Causal inference
- Collaborative projects
 - Japan Arteriosclerosis Longitudinal Study
 - Comprehensive Support Project for Oncology Research- Breast Cancer
 - Comprehensive Support Project for Adequate Treatment of Osteoporosis
 - Investigator-initiated clinical trials of cell therapies



Social Gerontology

<http://www.sg.m.u-tokyo.ac.jp/information.htm>

The three major research areas of this department include social gerontology, psychosocial oncology and biomedical ethics. The faculty and graduate students are multidisciplinary and include those whose primary training is in nursing, medicine, psychology, anthropology and health sciences. Using the theories and research methods of those disciplines, we aim to suggest practical ways to deal with a wide variety of public health problems.

- Exchange of social support and subjective well-being among the elderly
- Psychological well-being among the elderly who have experienced relocation
- Measurement of active life expectancy
- Sexuality and body image issues related to cancer treatments
- Treatment decision-making process among cancer survivors
- Self-help group activities for chronic, life-threatening illnesses
- Psychosocial issues related to infertility treatments
- Multi-disciplinary collaboration in the clinical setting



Class meeting of the department

Health Promotion Sciences

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

The main research activities of the Department of Health Promotion Sciences are experimental and survey research concerning health behavior and life-style related diseases. Our research results contribute to the proposals of health care systems, and health policy concerning health promotion in the community and the workplace.

Our classes include lectures and practical training and students are required to understand the methods of planning, implementation and evaluation of the health promotion programs in the community and the workplace.

Specific research topics include:

- Development of effective health promotion programs
- Assessment of the supportive environments in the community and the workplace
- Evaluation of the supporting methods for health behaviors
- Short- and long-term effects of behavior change
- Influence of behavior change on medical costs, and cost effectiveness analysis
- Social and physical environmental determinants of the adherence of behavior change



A scene as part of a community health promotion program

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.cbhel.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
- Publication of a medical ethics case book for Japan
- 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.

Nursing Administration / Advanced Clinical Nursing

Our research programs aim to support clinical nurses in providing high quality care for their patients in efficient way. Under a nation-wide healthcare reform, improving the efficiency of healthcare delivery systems becomes essential. For nursing care, assessing the efficacy and the putting in place of quality assurance systems are required. Applying management theories to nursing administration, we focus on nursing quality improvement, nurse staffing, patient classification systems, budgetary management, staff development and continuing education.

- Evaluation and improvement of quality of nursing care
- Benchmarking of nursing quality indicators
- Outcome management for nursing practice
- Risk management
- Human resources management
- Nursing case management and critical pathways
- Effect of care environment on patients
- International comparison of nursing quality indicators
- Nursing policy and economics



Promoting quality nursing care

Family Nursing

Hand-in-hand with the changes occurring in society, the formation and the function of the family is also changing. Current Japanese society expects not only client-centered perspective but also family-centered perspective from nursing research. We are especially focusing on the childrearing and childbearing family nursing research issues.

- Late effects of treatment and posttraumatic stress disorder in children with cancer
- Psychological preparation for children undergoing minor surgery
- Prevention of child abuse and neglect
- Care of dying children and their families
- Childbearing family formation process
- Postnatal depression and difficulties in childrearing



Our research focuses on the development of health care programs, and establishment and evaluation of community health care systems, in response to the health care needs of individuals, families, aggregates and the communities. Also, we are performing research on standardization of skills of public health nurses.

- Establishment and evaluation of community health care systems
 - Around-the-clock in-home care system
 - Expansion of the target of visiting nurse
 - Hospital discharge planning
 - Comprehensive community care, care-networking
- Development of health care programs
 - Support for people with diseases or disabilities
 - Support for families with babies and children
 - Elderly care
 - Occupational health
- Definition and standardization of skills of public health nurses/ Development of community health program

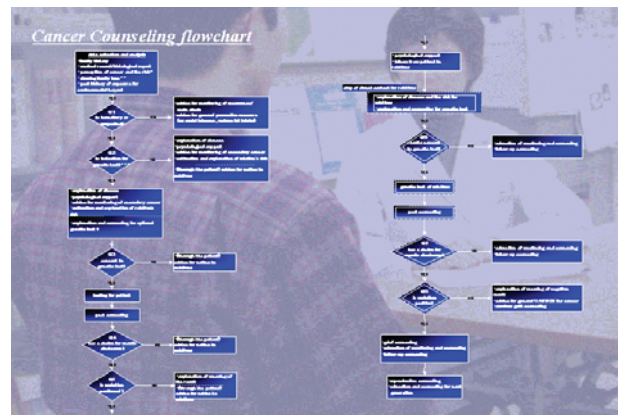


Concepts of the Community Health Nursing

Adult Nursing / Palliative Care Nursing

Mainly for subjects in their adulthood, we have been performing research in a variety of domains including prevention of diabetes and several chronic illnesses, support for coexistence with disease, and palliative care. Focal points in our research, which we conduct under a team approach, are strategies in education and provision of relevant information based on the findings of molecular biology, and the team-approach nursing care system.

- Prevention and self care support for chronic illness
- Development of HR-QoL scale for patients with chronic illness
- Physical activity in middle- aged / elderly
- Nursing care system for transplantation recipient / donor
- Genetic counseling in nursing
- Evaluation of palliative care services
- Continuity and dissemination of palliative care
- Nursing care system for out patients



Midwifery and Women's Health

Having been in place since June, 2002, our research activities focus on maternal-child health care as well as health promotion to achieve an all-round good life for the well woman.

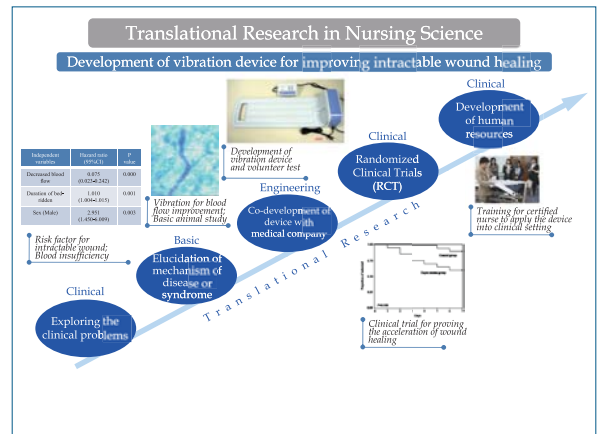
- Life style and oxidative stress during pregnancy
- Maternal body composition during pregnancy and infant birth weight
- Nutrition and weight management during pregnancy and postpartum
- Assessments of quality of life among pregnant and postpartum women
- Promotion of women's health care after delivery
- Change of posture and the local muscle system during pregnancy and postpartum
- Stress urinary incontinence and inner-unit in postpartum and middle-aged women
- Evaluating the predictive ability of biomarkers related to uterine contraction for the progress of labor



Photo by Sakae Kikuchi

The goal of our department is to achieve “Evidence-based practice and development of gerontological nursing and wound care management”, where we are striving to develop new techniques, instruments, and assessment skills in accordance of nursing science and engineering and clinical nursing. Especially, translational research is our focus in which the basic science will be translated into clinical science. We are featuring the development of evidence-based skin care for improving skin function in the elderly.

- 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
- Development and evaluation of evidence-based skin care methodology
 - Investigation of bioengineering aspect of elderly skin
 - Exploring of objective parameter of skin status
 - Development of intervention methodology for improving skin function



Example of translation research in our department





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 evidence base of global (both domestic and international) health programmes through the provision of best possible information and rigorous monitoring and evaluation. The department's members generate knowledge and ideas through their research, 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:

1. Health outcome research (mortality, morbidity and disability, health services, cost-effectiveness of interventions, disease modeling, resource flows, and impact evaluation, including tracking the progress towards the Millennium Development Goals and contribution to the Global Burden of Disease study);
2. Health system performance assessment, including the analysis of health system inputs (evidence on financing and human resources), outputs (service delivery, effective coverage), and impact (health status); and
3. Health and foreign policy (e.g. global health architecture and governance, G8 and global health, donor commitments).

Finally, the fundamental role of the Department is to produce the next generations of leaders in global health.



Community and Global Health

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

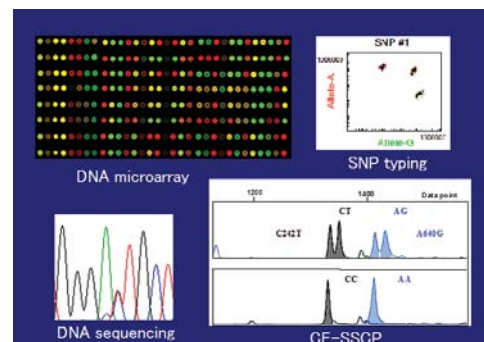
Our Department aims at bringing together clinical, public health and social science research to address following aspects of international health. We also conduct international cooperation activities with the U.N., JICA, local government and NGOs in developing countries. Our educational activities provide practical trainings for students, who are enthusiastic about contributing to research in international health and to international cooperation.

- Health promotion in developing countries
- Health and human rights
- Conflicts and health
- School health
- Infectious diseases (HIV/AIDS, TB, Malaria etc.)
- Nutrition
- Health policy and its impact on health of community people
- Global health workforce policy



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 microsatellite 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 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
 - Molecular mechanisms of sleep disorders
- Development of new methodologies for genomic polymorphism and gene expression analyses
- Analysis on the genome diversity of Asia-Pacific populations
- Development of methodologies for the analysis of protein interactions

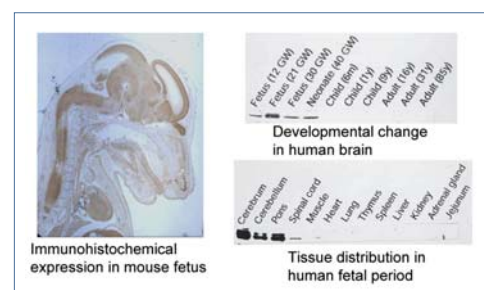


Tools for genomic analyses

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)



Time- and space-specific expression of doublecortin, a protein regulating neuronal migration

Human Ecology

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.

- 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



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

The aim of our department is to contribute to the overall global health and welfare through basic research. Our current interests are: the energy metabolism of humans, parasites, and bacteria; and RNA and RNA-binding proteins.

- Human succinate dehydrogenase complex and mitochondrial myopathy
- *Ascaris suum* and *Caenorhabditis elegans*
- Molecular mechanism of adaptation to low oxygen tension
- Mitochondrial quinol-fumarate reductase
- *C. elegans* as a model system of parasitic nematodes and ageing
- Malaria and Trypanosome: characterization of mitochondria as a target for chemotherapy
- *Escherichia coli* and *Mycobacterium*: respiratory enzymes and regulation of energy supply
- RNA and RNA-binding proteins
- Mitochondrial translation system
- RNA biogenesis of Eukarya and Archaea



Free-living nematode *Caenorhabditis elegans* expressing a recombinant green fluorescent protein inside the body under the control of the promoter of the iron-sulfur subunit (Ip) gene of succinate-ubiquinone reductase (complex II)





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

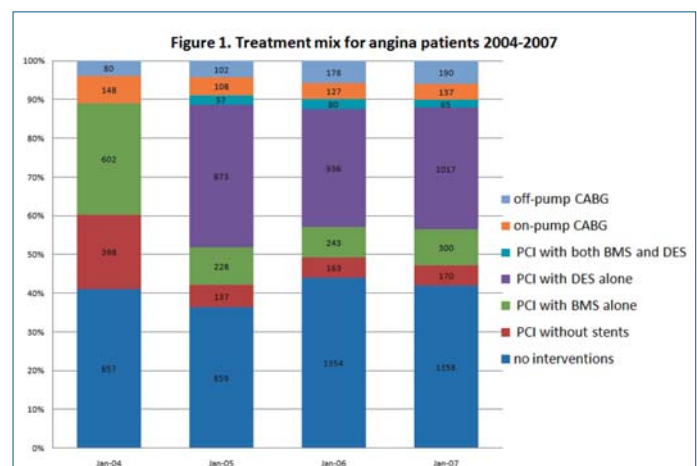


Health Economics and Epidemiology Research

The department purports to help students become a health service practitioner with a sound theoretical and scientific ground underscored by quantitative methods of epidemiology and economics. The department will also contribute to the society through conducting empirical assessment of health practice and policy on the themes such as;

- Economic assessment of medical technology
- Clinical evaluation through patient-derived outcome
- Standardization and management of quality of care
- Health policy assessment
- Health impact of socio-economic policy

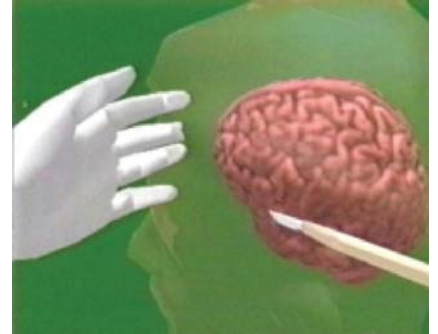
Changes in the treatment strategy mix for angina pectoris, before and after introduction of drug eluting stent. (Research in Aid from Ministry of Health Labor and Welfare, 2008)



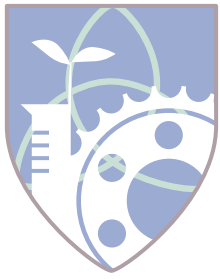
Clinical Information Engineering

Clinical Information Engineering 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 biomedical research and clinical care.

- Medical Decision Making
- Cancer informatics
- Data Mining & Knowledge Discovery in Database
- Virtual reality for medical science
- Social information engineering for Public Health



A virtual reality application for medical decision making



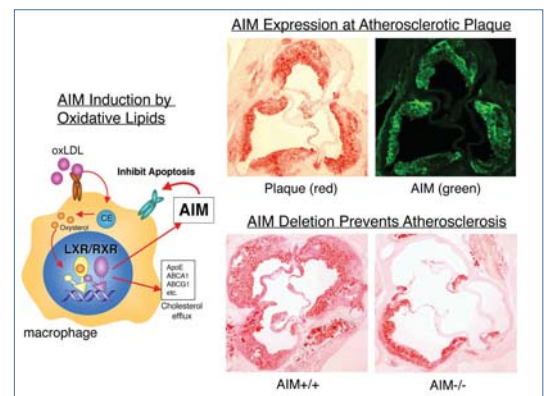
Center for Disease Biology and Integrative Medicine

Molecular Biomedicine for Pathogenesis

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

Focusing on functional analysis of newly isolated genes, particularly related to apoptosis, cell differentiation, or cell cycle, our laboratory is pursuing clarification of the pathogenesis of various diseases and the related physiological machineries in cellular and molecular aspects. Based on our technical advantage in gene manipulation via gene knockout and transgenesis, we give high priorities to *in vivo* analyses. Our overall goal is to apply our findings to development of novel and definitive therapies for types of diseases.

- Role of AIM (Apoptosis Inhibitor of Macrophage) in atherosclerosis development and other diseases
- Regulation of hematopoiesis and its relevance to leukemogenesis; via functional analysis of a newly identified Polycomb group molecule MBT-1
- Regulation of tumorigenesis by modulating apoptosis and cell cycle; via analysis of DEDD-deficient animals



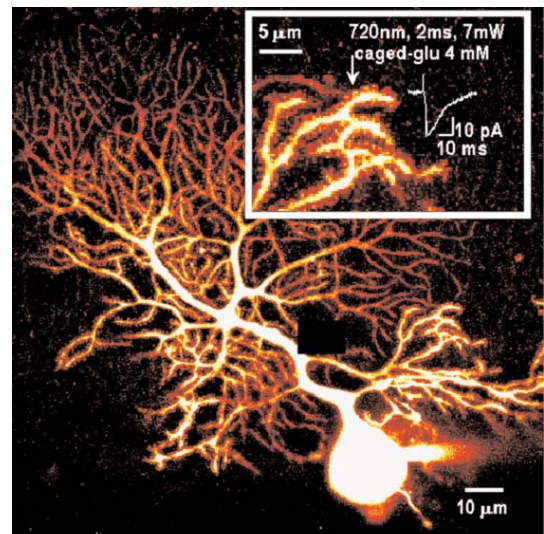
Structural Physiology

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

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

Fine structure and function of a central neuron studied with two-photon excitation imaging and uncaging



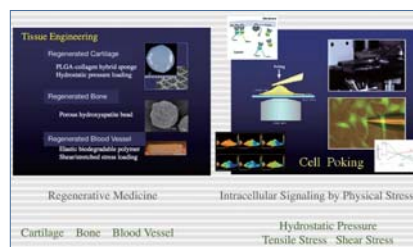
Regenerative Medical Engineering

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

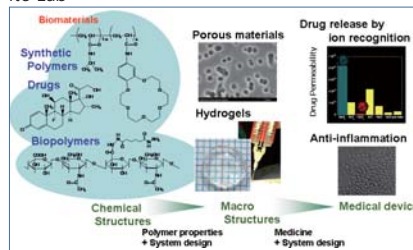
We aim to create a basic methodology for tissue engineering by integrating engineering sciences such as mechanical, material, and chemical system engineering into basic and clinical medicine. Especially for the regeneration of bones, cartilages, and blood vessels, we focus on cellular response to physical stimulations, which can be utilized instead of growth factors and cytokines. Besides, we focus on peritoneum as a place for *in vivo* tissue regeneration. Development of new biomaterials such as porous materials, hydrogels, molecular signal-responsive materials is also one of our major missions.

- Development of new polymeric and inorganic biomaterials for regenerative medicine
- *In vitro* regeneration of cartilages, bones, and small blood vessels
- Mechanism of cellular response to physical stimulations
- Development of new polymeric biomaterials for peritoneal diseases
- Mathematical system design for tissue regeneration process
- Development of molecular signal-responsive materials for a medical use

Ushida Lab



Ito Lab

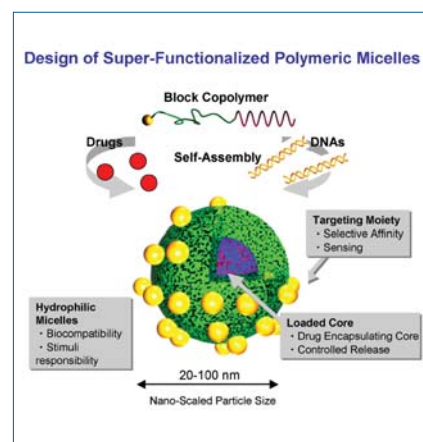


Clinical Biotechnology

<http://www.bmw.t.u-tokyo.ac.jp/english/index.html> <http://park.itc.u-tokyo.ac.jp/NBEP/index-en.html> <http://square.umin.ac.jp/t-e/>

Nanodevices produced by nanotechnology integrate materials and systems on a nanometer scale, and hold the key to realizing the futuristic medical system that can serve the needed function at the right time and the right place with minimal invasiveness. Furthermore, nanodevices are expected to become an important interface between basic biomedical science and clinical medicine by facilitating the translation of basic achievements into clinical applications. Our division wishes to produce revolutionary medical nanodevices based on nanotechnology and thereby to spread the idea of "Nanomedicine" intranationally and internationally.

- Development of nano-scaled carriers of drugs and genes based on polymeric micelles
 - Functional diagnostic imaging
 - Pinpoint cancer therapy
 - Gene therapy
- Development of functional polymeric micelles responsive to external stimuli
- Development of functional cell arrays based on nano-fabrication of polymers
- Development of intelligent scaffolds delivering drugs and genes and their application to regenerative medicine

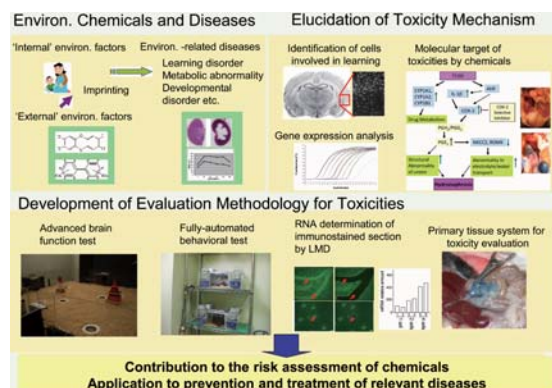


Environmental Health Sciences

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

Children's health problems of today include such conditions as disorders in the reproductive and immune functions, learning deficits, mental problem and 'metabolic syndrome'. Our research is carried out on the recognition that the homeostasis is disrupted by various environmentally hazardous chemicals, to which expectant mothers and their newborn babies are exposed during their highly sensitive period of life, and that the contamination with these chemicals may lead to various disease conditions in children after birth. Our experimental investigations are focused on the following themes.

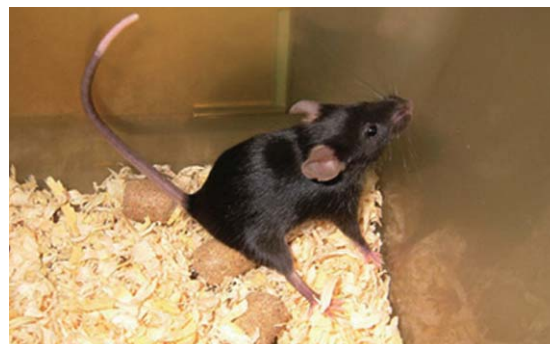
- Elucidation of mechanisms involved in the manifestation of toxicity at the molecular and cellular level due to exposure to environmental pollutants, such as dioxin/PCBs and heavy metals.
- Clarification of epigenetic mechanisms that alter susceptibility to environmental chemicals.
- Development of methodologies for evaluating the toxicity of chemicals to the learning and emotion of rodents and of *in vitro* toxicity techniques at the molecular and cellular levels.
- Development and application of techniques and methodology for evaluating risks of toxic substances in formulating safety standard for the environment and food.



Animal Resources / Research Resources and Support - Animal Research

Our laboratory focuses on understanding the molecular mechanisms which underlie the synaptic plasticity, activity dependent formation of neuronal circuitry, and learning and memory. We generate knockout mice and inducible knockout mice of signal transduction molecules including the glutamate receptors. We also manage the animal facilities, give researchers advice on their animal experiments, and give lectures on laboratory animal science so that animal experiments are carried out in consideration of animal welfare.

- Molecular analysis of brain function using genetically modified mice
- Development of new reproductive technologies in mammals
- Development of model animals for signal transduction diseases



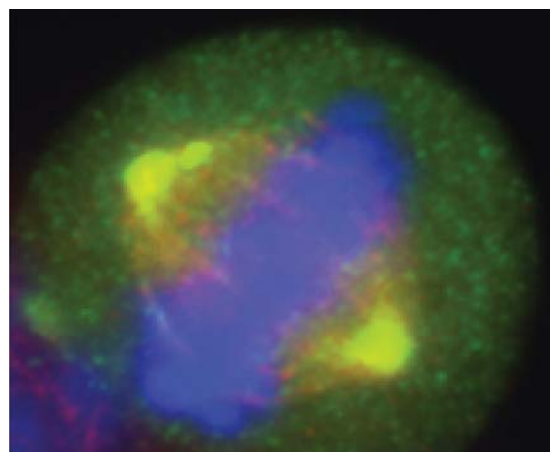
A mutant mouse lacking metabotropic glutamate receptor sub-type-1 (mGluR1).

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

Research Resources and Support - Bioinformatics

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

Targeting biomedical research support using information technologies, the division performs management of the research network and the central servers of the Graduate School of Medicine, and researches on knowledge infrastructure and processing techniques (e.g. information model, ontology, natural language processing, machine reasoning, etc.) and their application to clinical practice.

- Biomedical research support using network system
- Medical terminologies and ontologies
- Standardization of healthcare information and information models
- Natural language processing and its application to the medical domain
- Machine reasoning and clinical decision support systems



Computer System for Biomedical Research



Pharmacy

Pharmaceutical Services

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

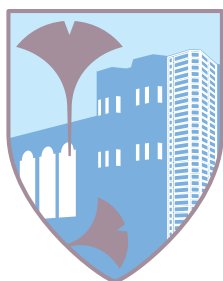
Our goal is to provide optimized pharmacotherapy for each patient, based on the analysis and prediction of individual pharmacokinetics, drug sensitivity and drug adverse reaction.

We are now advancing the basic study of the regulatory mechanism of gene function and gene expression, particularly focusing on the molecules related to osteoporosis and lifestyle diseases, as well as clinical application of genetic polymorphism analysis of drug metabolizing enzymes and drug transporters.

- Analysis of genotype and phenotype of drug metabolizing enzymes and drug transporters
- Strategies for accurate prediction of drug disposition, and pharmacokinetic/ pharmacodynamic (PK/PD) studies
- Transporters involved in lipid homeostasis
- Regulatory mechanisms of signaling molecules involved in bone homeostasis
- Basic and clinical approach to prevent and cure drug induced liver injury



Therapeutic drug monitoring



Central Clinical Facilities

Clinical Laboratory

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

Our main duty is to provide the high-quality results of laboratory tests. We also emphasize the basic research on laboratory automation and standardization, development and improvement of laboratory tests, and pathophysiological analyses through laboratory tests, as follows.

- Laboratory automation system
- Clinical application of genetic analysis of leukemia and drug response genes
- Analysis of bioactive substances, and its application to laboratory medicine
- Analysis of the cardiac functions using ultrasound
- Relationship between the respiratory function and various pathophysiological conditions
- Investigation of brain function using magnetoencephalography



Laboratory automation system

Surgical Center

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

Operating rooms were centralized as a surgical center for the first time in Japan, in the surgical ward building of University of Tokyo Hospital on July 1955. The surgical center moved to the new central building on January 1988. In July 2001, the branch hospital of our university located in Mejiro was closed and joined to our University Hospital located in Hongo. Furthermore, a new ward building was opened in October 2001. Since then, the number of operations has been remarkably increasing. Another new central building including new operating rooms will be constructed in fall 2006. A total of 9,868 operations were performed in the year 2008.

Teaching activities include lectures to the undergraduate and postgraduate medical students as well as nursing staffs and medical electronics engineers, regarding aseptic techniques, sterilization methods, disinfection methods, prevention of perioperative infections, humoral and cellular responses to trauma and shock, training of handwashing and gown techniques.

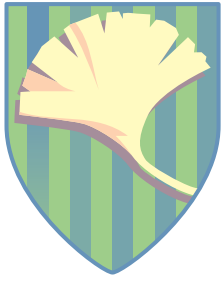
- Safety management in the operating rooms
- Efficient management of the operating rooms
- Cleaning, Disinfection and Sterilization
- Environmental control in the operating rooms
- Improvement of cost-effectiveness in the management of surgical center
- Perioperative infection control
- Precautions of accidental troubles in handling surgical instruments and medical devices
- Development of new surgical instruments and medical devices
- Three-dimensional processing of visual information



UMIN is the largest and most versatile academic medical information center in the world with 300 thousands registered medical professionals and 50 million pages per view monthly web accesses. UMIN is managed by the UMIN Council under the National University Hospital Association.

- Major information services
 - Electronic Library for Biomedical Sciences (ELBIS)
 - Internet Data and Information Center for clinical and epidemiological research (INDICE)
 - Evaluation system of Postgraduate Clinical training (EPOC)
 - Dental training Evaluation and taBUlation sysTem(Debut)
- Major research activities
 - Health communication
 - Science communication
 - Information systems for clinical and epidemiological research
 - Network security





Center

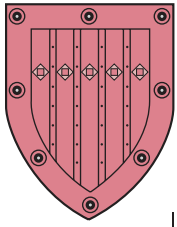
The International Research Center for Medical Education

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

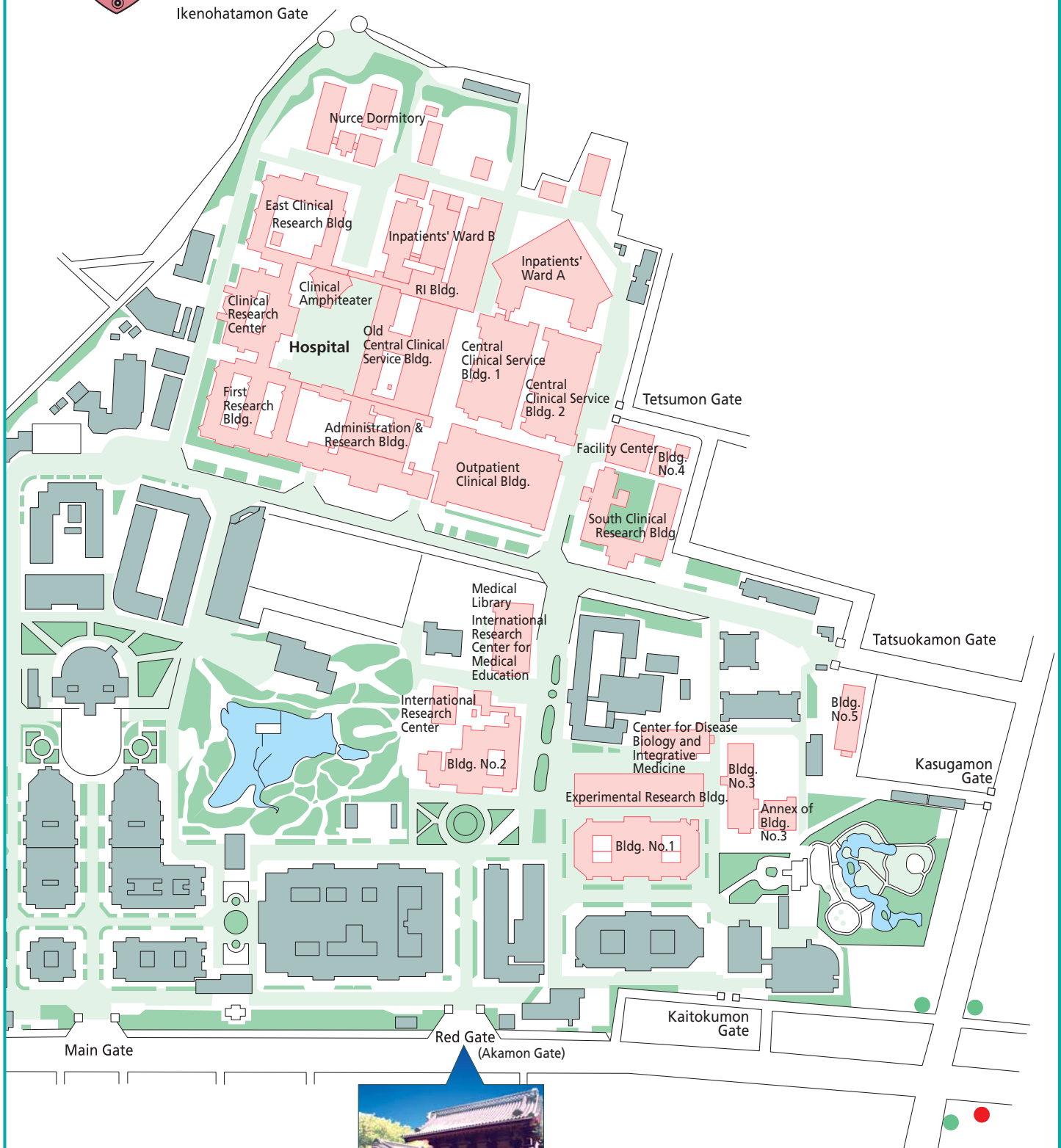
The International Research Center for Medical Education is a research institute to develop and improve medical education (including other health professional education) domestically and internationally. We implement innovative curricula for the Faculty of Medicine and invite overseas experts to provide updated information about medical education. We also manage international cooperation projects and produce a research hub in medical education field in Asian region such as Afghanistan and Lao P. D. R.



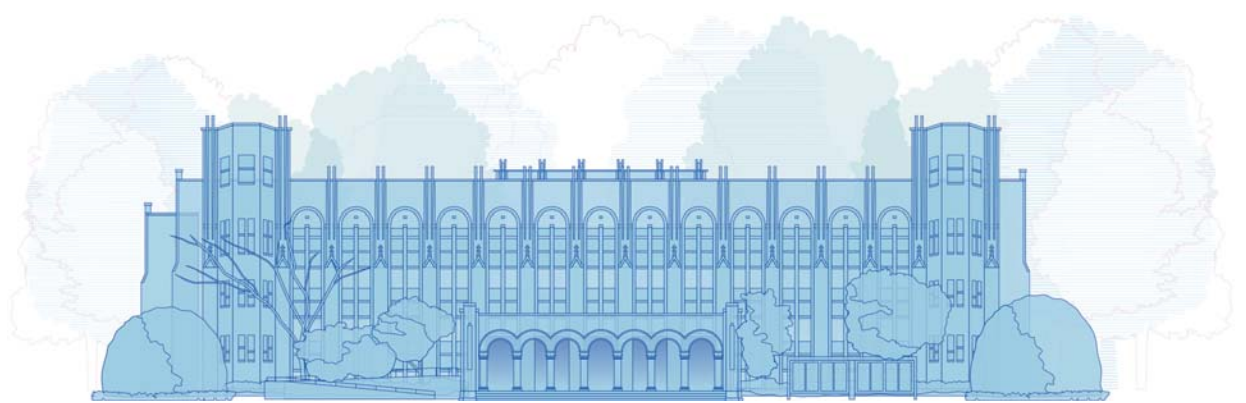
PBL class in Kabul Medical University, Afghanistan



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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