The University of Tokyo

Faculty of Medicine Graduate School of Medicine

PROSPECTUS 2005-2006



Welcome to Faculty of Medicine, Graduate School of Medicine The University of Tokyo

The University of Tokyo Graduate School of Medicine and Faculty of Medicine are dedicated to research and education in medicine, the health sciences, and nursing and purport to train future international leaders in their respective fields. The university has its origin in the smallpox vaccination clinic, which was established at Kanda Otamagaike in May of the 5th year of Ansei (1858) by contributions from 82 Dutch physicians who resided in Edo (the old name for Tokyo) at that time. In the 10th year of the Meiji era (1877), the University of Tokyo Faculty of Medicine, an official university system, was organized from this entity and started on an illustrious course to become the most prestigious medical school in the country. There are about 100 students in the medical school and about 50 in the health sciences and nursing for each academic year. The research department of the graduate school offers a master's degree in medical science, the health sciences and nursing, and international health. It also offers doctoral degrees in medicine, the health sciences and nursing, and international health. The school accepts 150 to 200 graduate students each academic year.

One does not need to prove the importance of medicine, which forms the nucleus of the life sciences and which has achieved dramatic progress in the 21st century; as well as studies such as social medicine, the health sciences, and nursing, in a modern society that is rapidly maturing and aging. Our research department is composed of many outstanding research sections that make active international contributions in diverse fields. Furthermore, new research buildings and hospitals are being constructed to respond to the needs of new education and research environments better.

Incorporating cutting-edge molecular cell biology, molecular genetics, biophysics, structural biology, biomedical engineering, and information science, research is being conducted in our research department on themes such as the organization of our body, the etiology of various diseases, elucidation of physiopathology, new diagnostic methodologies, and the development of therapeutic modalities. Pioneering research results are being introduced in Japan, as well as overseas in the area of social medicine and other disciplines through interactions between patients and society. The university is making significant contributions to society, while it is striving daily to train many pioneering scientists who will be responsible for formulating future medical treatments.

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Nobutaka Hirokawa Dean, Faculty of Medicine, 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 opera- tions 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 resi- dence 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 estab- lished.
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. Apr.	The Medical Library was built in commemoration of the centenary. The Institute of Medical Electronics was established.
1965	Apr.	The Research Institute of Logopedics and Pediatrics was established. The School of Health Care and Nursing was reorganized as the School of Health Sciences. The Graduate School of The University of Tokyo was reorganized and the Division of Medical Doctor Biological Science became the Faculty of Medicine. The Health science Course was established in the Medical Science Division.
1966	Sep.	The third building of the Faculty of Medicine was constructed.
1971	Apr.	The Laboratory of Animal Experiments was established.
1973	Mar.	The Animal Center for Biomedical Research was constructed.
1983	Jan.	An annex of the third building of the Faculty of Medicine was constructed.
1985	Sep.	The office of International Academic Affairs was established.
1987	Apr.	Specialized courses were introduced to the Graduate School of Medicine.
1992	Apr.	The School of Health Sciences became the School of Health Science and Nursing. The School of International Health was established in the Medical Science Division.
	Jul.	The Radiation Research Institute was established.
1995	Apr.	As a result of the shift to the chair system of the Graduate School of Medicine, four divisions, Third Basic Medicine, Social Medicine, Third and Fourth Clinical Medicine, were replaced with Pathology, Immunology and Microbiology, Social Medicine, Reproduction and Development, and Aging Science and Surgery.
1996	Apr.	As a result of the shift to the chair system of the Graduate School of Medicine, three divisions, First Clinical Medicine, Health Science, and International Health, were replaced with Internal Medicine, Health Science and Nursing, and International Health.
1997	Apr.	As a result of the shift to the chair system of the Graduate School of Medicine, three divisions, First and Second Basic Medicine, and Second Clinical Medicine, were replaced with Molecular Cell Biology, Functional Biology, Radiology and Biomedical Engineering, and Neuroscience. As a result of the above-mentioned reorganization, three institutes, the Institute of Brain Research, the Institute of Medical Electronics, and the Institute of Logopedics and Phoniatrics were made redundant.
1999	Apr.	The Master course of Medical Science was established in the Graduate School of Medicine. This course accepts graduates of all faculties except those from Schools of Medicine, Dentistry, and Veterinary Medicine.
2000	Apr.	The International Research Center for Medical Education was established (A shared facility for edu- cation 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.

Graduate School of Medicine

Molecular Cell Biology	 Cell Biology and Anatomy Cell Biology • Structural Biology • Structural Cell Biology • Cellular Neurobiology Biochemistry and Molecular Biology Molecular Biology • Cellular Signaling • Physiological Chemistry amd Metabolism
Functional Biology	 Physiology Integrative Physiology Cellular and Molecular Physiology Neurophysiology Pharmacology Cellular and Molecular Pharmacology Molecular Neurobiology
Pathology, Immunology and Microbiology	Pathology • Human Pathology and Diagnostic Pathology • Molecular Pathology • Surgical Pathology Microbiology • Microbiology • Infection Control and Prevention Immunology • Molecular Immunology • Clinical Immunology
Radiology and Biomedical Engineering	Radiology • Diagnostic Radiology • Radiotherapy • Nuclear Medicine • Radiation Oncology / Experimental Radiology Biomedical Engineering • System Physiology • Bioimaging and Biomagnetics • Biosystem Construction and Control • Biomechanics • Medical Optics • Clinical Engineering
Neuroscience	Basic Neuroscience • Neuropathology • Neuropathology Speech and Cognitive Neurosciences • Speech Science • Speech Science • Clinical Neuroscience • Neuropsychiatry • Neuropsychiatry • Neuroscience
Social Medicine	Occuaptional, Environmental and Preventive Medicine Molecular Preventive Medicine Public Health Radiological Health Forensic Medicine, and Medical Informatics and Economics Forensic Medicine Medical Informatics and Economics
Internal Medicine	Medicine I • Cardiovascular Medicine • Vascular Biology • Respiratory Medicine • Gastroenterology • Nephrology Medicine II • Endocrinology • Nutrition and Metabolism • Hematology and Oncology • Allergy and Rheumatology • Infectious Diseases • Stress Science and Psychosomatic Medicine Clinical Laboratory Medicine • Diagnostic Pathology • Transfusion Medicine
Reproductive, Developmental and Aging Sciences	Obstetrics and Gynecology • Reproductive Endocrinology • Gynecological Oncology • Perinatal Medicine • Molecular Reproductive Medicine Pediatric Sciences • Pediatrics • Developmental Pediatrics • Pediatric Oncology Aging Sciences • Geriatrics • Aging Research
Surgical Sciences	 Surgery Thoracic Surgery • Cardiovascular Surgery • Gastrointestinal Surgery Hepato Biliary Pancreatic Surgery • Urology • Artificial Organ and Transplantation Division Surgical Oncology • Vascular Surgery • Metabolic Care and Endocrine Surgery Sensory and Motor System Medicine Dermatology • Plastic and Reconstructive Surgery • Oral and maxillofacial Surgery Orthopaedic Surgery • Ophtalmology • Otorhinolaryngology, and Head & Neck Surgery Rehabilitation Medicine Vital Care Medicine Anesthesiology • Emergency and Critical Care Medicine
Health Sciences and Nursing	 Health Sciences Health Sociology • Mental Health • Epidemiology and Preventive Health Sciences • Biostatistics Social Gerontology • Health Promotion Sciences • Biomedical Ethics Nursing Sciences Advanced Clinical Nursing • Nursing Administration • Adult Nursing • Palliative Care Nursing Family Nursing • Community Health Nursing • Psychiatric Nursing Midwifery and Women's Health • Gerontological Nursing
International Health	International Social Medicine • Health Policy and Planning • International Community Health International Biomedical Sciences • Human Genetics • Developmental Medical Sciences • Human Ecology • Biomedical Chemistry
Center for Disease Biology and Integrative Medicine	 Basic Medical Sciences(1)Molecular Biomedicine for Pathogenesis Basic Medical Sciences(2)Biophysics Biomedical Materials and Systems Clinical Biotechnology Environmental Health Sciences Animal Research Radiation Biology Bioinformatics

Endowed Department	 Pharmacoepidemiology • Integrated Traditional Medicine (Tsumura) Corneal Tissue Regeneration (Amniotec Inc.) Clinical Vascular Regeneration (Daiichi Pharmaceutical Co.) Bone & Cartilage Regenerative Medicine • Hematopoietic Regeneration "Menicon" Cartilage of Bone Regeneration • Clinical Renal Regeneration Developmental and Medical Technology (Sankyo) • Metabolome Systematic Clinical Oncology • Hospital Logistics by Sagawa Express Co., Ltd. Clinical Molecular Epidemiology (Tanabe Seiyaku Co., Ltd.) • Immunotherapeutics (Medinet) Healthcare Related Informatics (NTT DATA CORPORATION) • Total Renal Care Medicine Integrated Molecular Science on Metabolic Diseases Advanced Clinical Science and Therapeutics • Sato Sports Plaza Co., Ltd Kaatsu Training Sleep Disorder Research • Health Care Management and Policy Computational Diagnostic Radiology and Preventive Medicine Clinical Bioinformatics • Center for Biomedical Ethics and Law
COE Program	Nano-Bioengineering Education Program Field-Transverse Research on Bio-Signal Transduction Mechanisms
	Center for Integrated Brain Medical Science Sundy on Deseases Caused by Environment/Genome Interactions
Institution	International Academic Affairs Medical Library
Faculty of Medicine	
School of Medicine	 Cell Biology and Anatomy Biochemistry and Molecular Biology 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 Pathology Obstetrics and Gynecology Pediatric Science Aging Science Sugery Sensory and Motor System Medicine Vital Care Medicine
School of Health Sciences and Nursing	 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 Intenal Medicine General Surgery General Clinical Surgery General S
Center	
	Health Service Center The International Research Center for Medical Education and Research
Administrative Divisio	n
	 General Affairs Office • Personnel Office • Research Liaison • Educational Affairs Graduate Student Affairs • Buget Office • Purchasing Office • Finance Office Facilities Office • Reception Service Medical Library Administration Office Medical Library • Infomation Service Medical Library



Molecular Cell Biology

Cell Biology and Anatomy*

Department of Cell Biology Professor Nobutaka Hirokawa, M.D., Ph.D. Associate Professor Yosuke Takei, M.D. Sen Takeda, M.D., Ph.D.

Department of Structual Biology Associate Professor Takao Nakata, M.D., Ph.D.

Department of Structual Cell Biology Associate Professor Yoshimitsu Kanai, M.D., Ph.D.

Department of Cellular Neurobiology Nobutaka Hirokawa, M.D., Ph.D. Professor

Biochemistry and Molecular Biology

Department of Molecular Biology* Hiroto Okayama, M.D., Ph.D. Professor Associate Professor Shigeki Jinno, Ph.D.

Department of Cellular Signaling* Takao Shimizu, M.D., Ph.D. Professor Associate Professor Takehiko Yokomizo, M.D., Ph.D.

Department of Physiological Chemistry and Metabolism* Hiroki Kurihara, M.D., Ph.D. Professor Associate Professor Tomoichiro Asano, M.D., Ph.D.





Physiology

Department of Integrative Physiology* Professor Yasushi Miyashita, Ph.D.

Department of Cellular and Molecular Physiology* Professor Kensaku Mori, Ph.D.

Department of Neurophysiology Tomoyuki Takahashi, M.D., Ph.D. Professor

Pharmacology

Department of Cellular and Molecular Pharmacology* Professor Masamitsu lino, M.D., Ph.D.

Department of Molecular Neurobiology* Professor Masayoshi Mishina, Ph.D.





Pathology

Department of Human Pathology/ Diagnostic Pathology* Masashi Fukayama, M.D., Ph.D. Professor

Department of Molecular Pathology* Kohei Miyazono, M.D., Ph.D. Professor

Associate Professor Keiji Miyazawa, Ph.D.

Dean Nobutaka Hirokawa, M.D., Ph.D.

Microbiology

Department of Microbiology* Professor Akio Nomoto, Ph.D. Associate Professor Tetsuro Matano, M.D., Ph.D.

Department of Infection Control and Prevention* Professor Kazuhiko Koike, M.D., Ph.D.

Immunology

Department of Immunology* Tadatsugu Taniguchi, Ph.D. Professor



Radiology*

Department of Diagnoatic Radiology Kuni Ohtomo, M.D., Ph.D. Professor Associate Professor Shigeki Aoki, M.D., Ph.D.

Department of Radiotherapy Associate Professor Keiichi Nakagawa, M.D., Ph.D.

Department of Nuclear Medicine Associate Professor Toshimitsu Momose, M.D.

Biomedical Engineering

Department of System Physiology* Professor Joji Ando, M.D., Ph.D.

Department of Bioimaging and Biomagnetics* Shoogo Ueno, Ph.D. Professor

Department of Biosystem Construction & Control* Associate Professor Yusuke Abe, M.D., Ph.D.





Basic Neuroscience

Department of Neuropathology* Professor Yasuo Ihara, M.D., Ph.D.

Department of Neurochemistry* Associate Professor Haruhiko Bito, Ph.D.

Department of Neurobiology

Speech and Cognitive Sciences

Department of Speech Science

Department of Cognitive Science* Professor Katsuyuki Sakai, M.D., Ph.D.

Department of Speech Physiology* Associate Professor Yoshihiro Takayama, M.D.

Clinical Neuroscience

Department of Neuropsychiatry* Professor Nobumasa Kato, M.D. Associate Professor Nobuo Nakayasu, M.D. Kouichi Tsunashima, M.D., Ph.D.

Department of Neurology*

Professor Associate Professor Shin Kwak, M.D.

Shoji Tsuji, M.D., Ph.D.

Department of Neurosurgery*

Associate Professor Akio Morita, M.D., Ph.D. Associate Professor Nobutaka Kawahara



Occupational, Environmental and Preventive Medicine

 Department of Molecular Preventive Medicine*

 Professor
 Kouji Matsushima, M.D., Ph.D.

 Associate Professor
 Sho Ishikawa-Yamawaki, M.D., Ph.D.

 Pepartment of Public Health*

 Professor
 Yasuki Kobayashi, M.D., Ph.D.

 Associate Professor
 Kazuo Inoue, M.D., Ph.D.

Department of Radiological Health

Forensic Medicine, and Medical Informatics and Economics

Department of Forensic Medicine* Professor Ken-ichi Yoshida, M.D., Ph.D.

Department of Medical Informatics and Economics*ProfessorKazuhiko Ohe, M.D., Ph.D.



Internal Medicine

Medicine I

Department of Cardiovascular Medicine*ProfessorRyozo Nagai, M.D., Ph.D.Associate ProfessorYasunobu Hirata, M.D., Ph.D.

Department of Respiratory Medicine*ProfessorTakahide Nagase, M.D., Ph.D.Associate ProfessorHajime Takizawa, M.D.

Department of Gastroenterology* Professor Masao Omata, M.D., Ph.D.

Department of Nephrology*

Medicine II

Department of EndocrinologyProfessorToshiro Fujita, M.D., Ph.D.Associate ProfessorTomoki Okazaki, M.D., Ph.D.

Department of Nutrition and Metabolism*ProfessorTakashi Kadowaki, M.D.

Department of Hematology and Oncology* Professor Mineo Kurokawa

 Department of Allergy and Rheumatology*

 Professor
 Kazuhiko Yamamoto, M.D., Ph.D.

Department of Infectious Diseases* Professor Kazuhiko Koike, M.D., Ph.D.

Department of Stress Science and Phychosomatic Medicine*ProfessorAkira Akabayashi, M.D.Associate ProfessorHiroaki Kumano, M.D.

Clinical Laboratory Medicine and Pathology

Department of Clinical Laboratory Medicine*ProfessorYutaka Yatomi, M.D.Associate ProfessorHitoshi Ikeda

Department of Transfusion Medicine* Associate Professor Koki Takahashi, M.D., Ph.D. (Transfusion Medicine)





Obstrtrics and Gynecology

Department of Reproductive Endocrinology*ProfessorYuji Taketani, M.D., Ph.D.Associate ProfessorTomoyuki Fujii, M.D., Ph.D.

Department of Gynecological Pathology* Associate Professor Tetsu Yano, M.D., Ph.D.

Department of Perinatal Medicine* Associate Professor Shiro Kozuma, M.D., Ph.D.

Department of Molecular Cellular Reproductive Medicine* Professor Osamu Tsutsumi, M.D., Ph.D.

Pediatric Sciences

 Department of Pediatrics*

 Professor
 Takashi Igarashi, M.D., Ph.D.

 Associate Professor
 Masashi Mizuguchi, M.D., Ph.D.

Department of Developmental Pediatrics*ProfessorTakashi Igarashi, M.D., Ph.D.Associate ProfessorTakashi Sekine, M.D., Ph.D.

Department of Pediatric Surgery* Professor Kohei Hashizume, M.D., Ph.D.

Department of Pediatric Oncology* Professor Kohei Hashizume, M.D., Ph.D.

Aging Sciences

 Department of Geriartics*

 Professor
 Yasuyoshi Ouchi, M.D., Ph.D. (Cardiology)

 Associate Professor
 Masahiro Akishita, M.D., Ph.D.

Department of Aging Research



Surgery

Department of Thoracic Surgery*ProfessorShinichi Takamoto, M.D., Ph.D.Associate ProfessorJun Nakajima

 Department of Cardiovascular Surgery*

 Professor
 Shinichi Takamoto, M.D., Ph.D.

 Associate Professor
 Arata Murakami, M.D., Ph.D.

Department of Gastrointestinal Surgery* Professor Michio Kaminishi, M.D., Ph.D.

Department of Hepato Biliary Pancreatic Surgery*ProfessorMasatoshi Makuuchi, M.D., Ph.D.Associate ProfessorNorihiro Kokudo, M.D.

Department of Urology*ProfessorTadaicAssociate ProfessorSatoru

Tadaichi Kitamura, M.D., Ph.D. Satoru Takahashi, M.D., Ph.D. Takumi Takeuchi, M.D., Ph.D.

Department of Artificial Organ and Transplantation Division* Professor Masatoshi Makuuchi, M.D., Ph.D.

Associate Professor Yasuhiko Sugawara, M.D.

Department of Surgical Oncology*ProfessorHirokazu Nagawa, M.D., Ph.D.Associate ProfessorToshiaki Watanabe, M.D., Ph.D.

Department of Vascular Surgery*ProfessorHirokazu Nagawa, M.D., Ph.D.Associate ProfessorTetsuro Miyata, M.D., Ph.D.

Department of Surgical Metabolic care and Endocrine Surgery* Professor Michio Kaminishi, M.D., Ph.D.

Sensory and Motor System Medicine

Department of De	rmatology*
Professor	Kunihiko Tamaki, M.D., Ph.D
Associate Professor	Kanako Kikuchi, M.D., Ph.D.

Department of Plastic and Reconstructive Surgery* Isao Koshima, M.D., Ph.D. Professor

Associate Professor Hirotaka Asato, M.D.

Department of Oral and Maxillofacial Surgery*

Professor Tsuyoshi Takato, M.D., Ph.D. Associate Professor Takafumi Susami, D.D.S. Yoshiyuki Yonehara, M.D., Ph.D.

Department of Orthopaedic Surgery*

Kozo Nakamura, M.D., Ph.D. Professor Associate Professor Yoshio Takatori, M.D. Hiroshi Kawaguchi, M.D.

Department of Ophtthalmology* Professor Makoto Araie, M.D., Ph.D.

Associate Professor Goji Tomita, M.D. Yoshihiro Tamaki, M.D., Ph.D.

Department of Otorhinolaryngology and Head & Neck Surgery* Kimitaka Kaga, M.D., Ph.D. (Otology, Neurotology, Professor Audiology, Medical education)

Associate Professor Tatsuya Yamasoba, M.D. (Otology, Neurotology and Audiology)

Department of Rehabilitation Medicine* Fumio Eto, M.D., Ph.D. Professor

Vital Care Medicine

Department of Anesthesiology* Associate Professor Hideko Arita, M.D. Tomoki Nishiyama, M.D.

Department of Emergency and Critical Care Medicine* Naoki Yahagi, M.D., Ph.D. Professor



Health Sciences Department of Health Sociology*

Associate Professor Yoshihiko Yamazaki, Ph.D.

Department of Mental Health* Associate Professor Iwao Oshima, Ph.D.

Department of Epidemiology and Preventive Health Sciences* Yasuo Ohashi, Ph.D. Professor

Department of Biostatistics* Associate Professor Yutaka Matsuyama, Ph.D.

Department of Social Gerontology* Professor Ichiro Kai, M.D., M.P.H.

Department of Health Promotion Sciences* Professor Akira Akabayashi, M.D., Ph.D.

Department of Biomedical Ethics* Akira Akabayashi, M.D., Ph.D. Professor



Nursing Sciences

Department of Advanced Clinical Nursing* Katsuya Kanda, R.N,. P.H.N., Ph.D. Professor

Department of Nursing Administration* Professor Katsuya Kanda, R.N., P.H.N., Ph.D. Department of Adult Nursing* Professor

Keiko Kazuma, R.N., P.H.N., Ph.D. Department of Palliative Care Nursing*

Keiko Kazuma, R.N., P.H.N., Ph.D. Professor

Department of Family Nursing* Associate Professor Keiko Kamibeppu, R.N., P.H.N., Ph.D.

Department of Community Health Nursing* Sachiyo Murashima, R.N., P.H.N., Ph.D. Professor

Department of Psychiatric Nursing*

Department of Midwifery and Women's Health* Sachiyo Murashima, R.N., P.H.N., Ph.D. Professor

Department of Gerontological Nursing* Professor Hiromi Sanada, M.D., Ph.D.



International Social Medicine

Department of Health Policy and Planning* Associate Professor Chushi Kuroiwa, M.D., Ph.D.

Department of International Community Health* Professor Susumu Wakai, M.D., Ph.D.

International Biomedical Sciences

Department of Human Genetics* Professor Katsushi Tokunaga, Ph.D. Associate Professor Naoyuki Tsuchiya, M.D., Ph.D.

Department of Developmental Medical Sciences* Hiroshi Ushijima, M.D., Ph.D. Professor

Associate Professor Hideoki Fukuoka, M.D., Ph.D.

Department of Human Ecology* Professor Chiho Watanabe, Ph.D. Masahiro Umezaki Associate Professor

Department of Biomedical Chemistry* Professor Kiyoshi Kita, Ph.D.





Director	Takao Shimizu, M.D., Ph.D.	
Division of Basic M (1)Molecular Biom	/ledical Sciences Jedicine for Pathogenesis*	
Professor	Toru Miyazaki	
(2)Biophysics*		
Professor	Haruo Kasai	
Division of Biome	dical Materials and Systems	
Professor	Takashi Ushida, Ph.D.	
Associate Professor	Yasuyuki Sakai, Ph.D.	
Division of Clinical Biotechnology*		
Professor	Kazunori Kataoka, Ph.D.	
Associate Professor	Chung Ung-il, M.D., Ph.D.	
Division of Enviro	nmental Health Sciences*	
Professor	Chiharu Tohyama, M.S., Ph.D.	
Associate Professor	Seiichiroh Ohsako	
Division of Resear Section of Animal	ch Resources and Support Research*	
Professor	Akio Nomoto, Ph.D.	
Section of Radiation Professor Associate Professor	on Biology* Kiyoshi Miyagawa, Ph.D. Yoshio Hosoi, M.D., Ph.D.	
Section of Bioinfo	rma*	

Endowment Department

Department of Pharmacoepidemiology Kiyoshi Kubota, M.D., Ph.D. Associate Professor Department of Integrated Traditional Medicine (Tsumura) Tetsuro Okabe, M.D., Ph.D. Associate Professor Department of Corneal Tissue Regeneration (Amniotec Inc.) Associate Professor Satoru Yamagami. M.D.,Ph.D. Department of Clinical Vascular Regeneration (Daiichi Pharmaceutical Co.) Hiroyuki Koyama, M.D., Ph.D. Associate Professor Department of Bone & Cartilage Regenerative Medicine Associate Professor Chung, Ung-il, M.D., Ph.D. Department of Hematopoietic Regeneration Seishi Ogawa, M.D., Ph.D. Associate Professor Department of "Menicon" Cartilage of Bone Regeneration Associate Professor Kazuto Hoshi, M.D., Ph.D. **Department of Clinical Renal Regeneration** Keiichi Hishikawa, M.D., Ph.D. Associate Professor Department of Developmental and Medical Technology (Sankyo) Professor Hiroshi Suzuki, Ph.D. **Department of Metabolome** Ryo Taguchi, Ph.D. Professor Associate Professor Yoshiya Oda **Department of Systematic Clinical Oncology** Associate Professor Shin Sasaki, M.D., Ph.D. Hospital Logistics by Sagawa Express Co., Ltd. Professor Hirohito Kuse Clinical Molecular Epidemiology (Tanabe Seiyaku Co., Ltd.) Associate Professor Takanari Gotoda, M.D., Ph.D. **Immunotherapeutics (Medinet)** Associate Professor Kazuhiro Kakimi, M.D., Ph.D. Healthcare Related Informatics (NTT DATA CORPORATION) Associate Professor Shinya Oku **Division of Total Renal Care Medicine** Associate Professor Shinya Kaname, M.D., Ph.D. **Integrated Molecular Science on Metabolic Diseases** Toshimasa Yamauchi, M.D., Ph.D. Associate Professor Department of Advanced Clinical Science and Therapeutics Associate Professor Koji Kawakami, M.D., Ph.D. Masataka Sata, M.D., Ph.D. Sato Sports Plaza Co., Ltd Kaatsu Training Toshiaki Nakajima, M.D., Ph.D. Associate Professor **Department of Sleep Disorder Research (Alfresa)** Takashi Ebisawa, M.D., Ph.D. Associate Professor Translational Research Based on the Clinical Database Dobun Havashi, M.D., Ph.D. Associate Professor Department of Joint Disease Research Associate Professor Noriko Yoshimura, M.D., Ph.D. **Health Care Management and Policy** Professor Hideki Hashimoto **Computational Diagnostic Radiology and Preventive Medicine** Associate Professor Naoto Hayashi, M.D., Ph.D. **Research Unit Department of Clinical Bioinformatics** Tsutomu Yamazaki, M.D., Ph.D. Professor Professor Hiroshi Oyama, M.D., Ph.D. Professor

Akihide Hashizume, Ph.D. Professor Yasushi Kodama, M.D. Associate Professor Yuzo Onogi, M.D., Ph.D. Daisuke Koide, Ph.D. Associate Professor Associate Professor Hitoshi Matsuo, M.S. **Center for Biomedical Ethics and Law**

Nano-Bioengineering Education Program

COF (Center of Excellence) Program

Field-Transverse Research on Bio-Signal Transduction Mechanisms **Center for Integrated Brain Medical Science** Associate Professor Hiroshi Kawasaki

Sutudy on Diseases Caused by Environment/Genome Interactions Associate Professor Makoto Miyagishi Kojiro Ueki Associate Professor

Institution

Office of International Academic Affairs

Kazuhiko Yamamoto, M.D., Ph.D. Head

Medical Library

Head Yasuyoshi Ouchi, M.D.

Faculty of Medicine

Dean Nobutaka Hirokawa, M.D., Ph.D.

University Hospital

Director

Ryozo Nagai, M.D

Clinical Division (Department of Intenal Medicine)

General Medicine Yasuyoshi Ouchi, M.D. Professor **Cardiovascular Medicine** Ryozo Nagai, M.D. Professor Yasunobu Hirata, M.D., Ph.D. Associate Professor **Respiratory Medicine** Takahide Nagase, M.D., Ph.D. Professor Associate Professor Hajime Takizawa, M.D. Gastroenterology Professor Masao Omata, M.D., Ph.D. Nephrology and Endocrinology Professor Toshiro Fujita, M.D., Ph.D. Associate Professor Tomoki Okazaki, M.D., Ph.D. **Metabolic Diseases** Takashi Kadowaki, M.D. Professor Hematology and Oncology Allergy and Rheumatology Kazuhiko Yamamoto, M.D., Ph.D. Professor Infectious Diseases Professor Kazuhiko Koike, M.D., Ph.D. Neurology Shoji Tsuji, M.D. Shin Kwak, M.D. Professor Associate Professor **Geriatric Medicine** Yasuyoshi Ouchi, M.D. Professor Associate Professor Masahiro Akishita, M.D., Ph.D. **Psychomatic Medicine** Akira Akabayashi, M.D. Hiroaki Kumano, M.D. Professor Associate Professor **Clinical Division (Department of Surgery) General Surgery** Professor Masatoshi Makuuchi, M.D. Stomach and Esophagus Surgery Professor Michio Kaminishi, M.D. **Colon and Rectal Surgery**

Hirokazu Nagawa, M.D., Ph.D. Professor Associate Professor Toshiaki Watanabe, M.D., Ph.D.

Hepatobiliary Pancreatic Surgery Masatoshi Makuuchi, M.D.

Professor Associate Professor Norihiro Kokudo, M.D. Vascular Surgery Professor Associate Professor

Hirokazu Nagawa, M.D., Ph.D. Tetsuro Miyata, M.D., Ph.D.

Breast and Endocrine Surgery

Professor Michio Kaminishi, M.D.

Artificial Organ and Transplantation Surgery Masatoshi Makuuchi, M.D. Professor

Associate Professor Yasuhiko Sugawara, M.D. **Cardiovascular Surgery** Professor

Shinichi Takamoto, M.D. Arata Murakami, M.D., Ph.D. Thoracic Surgery

Shinichi Takamoto, M.D. Jun Nakajima

Neurosurgery Takaaki Kirino, M.D., Ph.D. Professor Associate Professor

Associate Professor

Associate Professor

Professor

Akio Morita, M.D., Ph.D. Nobutaka Kawahara, M.D., Ph.D.

Anesthesiology and Pain Relief Center

Associate Professor Hideko Arita, M.D. Tomoki Nishiyama, M.D.

Urology and Andrology Tadaichi Kitamura, M.D. Professor Associate Professor Takumi Takeuchi, M.D., Ph.D.

Satoru Takahashi, M.D. **Gynecologic Surgery**

Ósamu Tsutsumi Professor Associate Professor Tetsu Yano

Professor

Clinical Division (Department of Sensory and Motor System Medicine)

Dermatology and Photolaser Medicine Professor Kunihiko Tamaki, M.D., Ph.D. Associate Professor Kanako Kikuchi, M.D., Ph.D. **Opthalmology and Vision Collection**

Makoto Araie, M.D. Associate Professor Goji Tomita, M.D. Yasuhiro Tamaki, M.D., Ph.D.

Orthopaedic Surgery and Spinal Surgery Professor Kozo Nakamura, M.D Yoshio Takatori, M.D. Associate Professor

Hiroshi Kawaguchi, M.D. Otorhinolaryngology, and Auditory and Voice Surgery Kimitaka Kaga, M.D Professor

Tatsuya Yamasoba, M.D. Associate Professor **Rehabilitation Medicine** Professor Fumio Eto, M.D.

Plastic, Reconstructive and Aesthetic Surgery Professor Isao Koshima, M.D., Ph.D.

Hirotaka Asato, M.D Associate Professor

Oral-Maxillofacial Surgery Dentistry and Orhtodontics Professor Tsuyoshi Takato, M.D. Associate Professor Takafumi Susami, D.D.S Yoshiyuki Yonehara, M.D., Ph.D.

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

Pediatrics Professor Associate Professor

Takashi Igarashi M.D., Ph.D. Masashi Mizuguchi, M.D., Ph.D. Takashi Sekine, M.D., Ph.D.

Pediatric Surgery Professor Kohei Hashizume, M.D., Ph.D.

Obstetrics and Gynecology Professor Yuji Taketani Associate Professor Shiro Kozuma

Clinical Division (Department of Neuropsychiatry)

Neuropsychiatry Professor Associate Professor

Nobumasa Kato, M.D. Nobuo Nakayasu, M.D. Kouichi Tsunashima, M.D., Ph.D.

Cinical Division (Department of Radiology)

Radiology Professor

Kuni Ohtomo, M.D., Ph.D.

Associate Professor

Keiichi Nakagawa, M.D., Ph.D. Shigeki Aoki, M.D., Ph.D. Toshimitsu Momose, M.D.

Central Clinical Facilities

Clinical Laboratory Center* Yutaka Yatomi, M.D. (Professor of Medicine, Department Director of Clinical Laboratory Medicine)

Department of Surgical Center* Associate Professorr Hiroshi Shigematsu, M.D., Ph.D. Yoshikazu Mimura, M.D., Ph.D.

Department of Radiological Center Professor and Director Kuni Ohtomo (Diagnostic Radiology)

Department of Emergency Services Professor Naoki Yahaai

Department of Transfusion Medicine and Immunohematology Koki Takahashi, M.D. (Transfusion Medicine) Professor

Department of Maternal Fetal and Neonatal Yuji Taketani, M.D., Ph.D. Professor

Department of Rehabilitation Service Professor Fumio Eto, M.D

Department of Medical Engineering (tentative name)

Supply Center (tentative name) Associate Professor Hiroshi Shigematsu, M.D., Ph.D.

Department of Intensive Care Unit Naoki Yahagi Professor

Department of Intensive Pathology Professor Masashi Fukayama, M.D., Ph.D.

Department of Corneal Transplantation Associate Professor Shiro Amano, M.D.

University Hospital Medical Information Network Center* Professor Takahiro Kiuchi, M.D., Ph.D.

Department of Cell Therapy and Transplantation Medicine Associate Professor Shigeru Chiba, M.D., Ph.D.

Department of Infection Control and Prevention Kazuhiko Koike, M.D. Ph.D Professor

Department of Endoscopy and Endoscopic Surgery Associate Professor Takao Kawabe, M.D., Ph.D.

Center for Hemodialysis and Apheresis Professor Toshiro Fujita, M.D.

Clinical Research Center (tentative name) Professor Masao Omata, M.D., Ph.D. Associate Professor Yoshihiro Arakawa, Ph.D

Department of Medical Social Service and Welfare Professor Yasuyoshi Ouchi, M.D.

Department of Planning, Information and Management Kazuĥiko Ohe, M.D., Ph.D. Professor

Department of Organ Transplantation Service Masatoshi Makuuchi, M.D. Professor

Pharmacy

Pharmaceutical Department* Professor Hiroshi Suzuki, Ph.D. Associate Professor Akinari Ito, Ph.D.

Nursing Department

Administration Office





Health Service Center* Director Associate Professor

Hoshio Uehara, M.D., Ph.D. Tsukasa Sasaki, M.D., Ph.D. Yasushi Ookubo

The International Research Center for Medical Education and Research*

Director Professor Associate Professor

Kimitaka Kaga, M.D., Ph.D. Kiyoshi Kitamura, M.D., Ph.D. Junji Ohtaki, M.D., Ph.D.



Faculty of Medicine Graduate School of Medicine The University of Tokyo

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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.)

Molecular Biology

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

With the goal of understanding the molecular mechanisms controlling growth and differentiation, we have been studying the cell cycle with cultured mammalian cells and fission yeast as model systems.

- Understanding the molecular mechanism enabling the anchorage-independent S phase onset that is the key for malignant transformation
- Understanding the G1 and G2 cell cycle checkpoint controls
- Understanding the molecular switch between growth and differentiation



Eukartotic cell cycling

Cellular Signaling-

http://biochem2.umin.jp

Our laboratory specializes in biochemistry, molecular and cellular biology, and genetic engineering to elucidate the roles of lipid mediators *in vivo*. 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 receptors for lipid mediators
- Cloning, functional characterization and K/O studies of enzymes involved in the metabolism of lipid mediators
- Functional regulation of GPCR
- Roles of lipid mediators in the central nervous and immunological systems



Melanocytic tumor in platelet-activating factor receptor transgenic mice

Physiological Chemistry and Metabolism

http://bio.m.u-tokyo.ac.jp/

Developmental and regenerative medicine group is investigating the molecular mechanisms of embryogenesis and is establishing a unique basis for regenerative medicine; metabolic regulation group is studying the signaling mechanisms regulating metabolism and cell growth to develop new therapy for metabolic syndrome.

- Developmental biology and regenerative medicine
 - Neural crest development and formation of the branchial arch and cardiovascular system
 - Reprogramming in early embryogenesis
 - Organogenesis and regeneration of vessels, inner ear and lung
 - Establishment and analysis of disease model mice
 - Establishment of therapeutic cloning models in mice
- Metabolism regulation and pathophysiology
 - Analysis of protein complexes in intracellular signaling and transcription
 - Proteomics and localization analysis of proteins constituting intracellular organelles
 - Analysis of a novel Akt-binding protein, APE
 - Molecular mechanisms of insulin-resistance in metabolic syndrome



Transfer of somatic nuclei into enucleated mouse oocytes using a Piezo-driven micromanipulator



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
- Molecular and cellular mechanisms for the axonal recognition of specific target neurons and for the formation of specific neuronal circuits
- 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

Neurophysiology

http://nphystky.umin.ac.jp

Our laboratory was originally part of the Brain Research Institute, but was integrated into the University of Tokyo Graduate School of Medicine in 1996. We teach neurophysiology to medical undergraduates, and Master and PhD course students. In research, using patch clamp techniques in combination with molecular techniques, we aim at elucidating molecular mechanisms underlying transmitter release and its regulation, with particular respect

to postnatal developmental changes.

- Identification and developmental changes of presynaptic voltage-gated ion channel mechanisms involved in the modulation and regulation of transmitter release
- Identification of the molecular target of presynaptic facilitation
- Molecular mechanism underlying transmitter release probability
- Molecular mechanism underlying presynaptic plasticity
- Molecular mechanism regulating transmitter content in synaptic vesicles
- Molecular mechanism underlying developmental changes in the presynaptic Ca²⁺ microdomain
- Elucidation of the auditory-activity-dependent regulation of synaptic function at the calyx of Held synapse



Simultaneous pre- and postsynaptic whole cell recordings at the calyx of Held synapse. Inset records on the left show a presynaptic action potential and excitatory postsynaptic currents (EPSC). The inset on the right illustrates the procedure of the patch-clamp whole-cell recording method

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 genetically coded indicators of important cell signals
- Molecular approaches to the study of IP₃ receptor-mediated Ca²⁺ signalling
- Elucidation of the relationship between Ca²⁺ signalling and cell functions
- Visualization and analysis of molecular events at synapses





Imaging of synaptically induced nitric oxide dynamics in cerebellar Purkinje cell

Molecular Neurobiology-

http://www.pharmacol2.m.u-tokyo.ac.jp/

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



Glutamate receptor $\delta 2$ selectively expressed in cerebellar Purkinje cells



Pathology, Immunology and Microbiology

Human Pathology and Diagnostic Pathology

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

We investigate the pathogenesis and pathobiology of disease, especially the neoplasmic diseases, using morphological techniques. 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
- Pyothorax associated lymphoma
- Molecular epidemiology of human herpes virus
- Lung adenocarcinoma and scar formation
- Lung fibrosis and adenocarcinoma
- Application of molecular pathology to diagnostic pathology
 - Classification of lung cancer using DNA chip
 - Grading of malignancy
 - Acceleration of pathological diagnosis



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 endothelial cells. Based on these findings, we will develop new strategies for the treatment of vascular diseases and cancer.

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



Signaling by TGF- β receptors and Smad proteins

Microbiology

http://microbiology.m.u-tokyo.ac.jp/

Our major objective is elucidation of the molecular mechanisms for replication and pathogenesis of RNA viruses, such as poliovirus, hepatitis C virus, and human immun-

odeficiency virus. Based on the outcome, we will develop new strategies against those viral diseases.

- Roles of the human poliovirus receptor in poliovirus infection
- Molecular mechanisms for the dissemination pathways of poliovirus
- Molecular mechanisms for the replication of poliovirus in neurons
- Molecular mechanisms for the development of hepatocellular carcinoma following hepatitis C virus infection
- Replication mechanisms of the hepatitis C virus RNA replicon
- IRES (internal ribosome entry site) activity-dependent virus tropism
- Development of AIDS vaccine
- Virus-specific immune response



Three-dimensional structure of poliovirus (Courtesy of James M.Hogle)

Infection Control and Prevention -

We are engaged in education of medical staff as wellas 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. Infection control team

- Development of preemptive strategies for the control of healthcareassociated 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

cytokine signaling cross talk.

system in innate immune responses

- Molecular analysis of innate immunity in microorganism infection
- New detection method and pathogenesis of opportunistic cytomegaloviral infection
- Mechanism of multi-drug resistant microorganisms



Immunology -



Spatiotemporal regulation of the TLR9-IRF-7 pathway in dendritic cells. The TLR9 ligand CpG-A DNA is retained in

endosomes of plasmacytoid dendritic cells (or IFN producing cells), wherein the labeled CpG-A merges with IRF-7 transcription factor. This is critical to sustain the TLR9 signal for prolonged activation of IRF-7 to efficiently induce IFN- α/β genes (left). On the other hand, in conventional dendritic cells, CpG-A undergoes rapid traf-ficking to lysosomes, therefore these cells fail to achieve high-level IFN- α/β induction (right).

- differentiation mechanism, natural killer (NK) cell differentiation • The mechanisms of regulation of antigen-presenting cells (APCs), typically dendrite cells (DCs), by IFN- α/β and other cytokines and toll-like receptors (TLRs)
- The regulation of oncogenesis by IFN- α/β and the tumor suppressor p53, particularly their mutual cooperation and function on target genes (Noxa etc.)

• The mechanisms of signaling and transcription networks operating in the IFN- α/β

ulatory factors (IRFs), in innate and adaptive immune responses, such as Th1/Th2

- Regulation of hematopoiesis and autoimmunity by IFNs and IRFs.
- Spatiotemporal regulation of the TLR and cytokine signaling in lymphocytes and antigen-presenting cells.



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
 - Gamma knife radiosurgery 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 computerassisted 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 artherogenesis 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

Bioimaging and Biomagnetics

Our department specializes in biomagnetic research, which includes the measurement of biomagnetic fields, magnetic stimulation of the brain, and the effects of magnetic fields on biological systems. We develop, integrate and apply new ideas through innovative interdisciplinary research approaches for the development of noninvasive medical applications using electromagnetic fields.

- Studies into brain function dynamics using transcranial magnetic stimulation (TMS) and current distribution imaging of magnetic resonance imaging (MRI)
- Application of repetitive TMS for the treatment of central nervous system diseases and mental illnesses
- Studies of higher brain functions using MEG and EEG
- Imaging of electrical information based on MRI
- Effects of electromagnetic fields on biological systems
- Magnetic orientation and reorganization of biological materials
- Biomagnetic cell and tissue engineering



Functional dynamics imaging of the brain by TMS and MRI

Biosystem Construction and Control-

http://www.bme.rcast.u-tokyo.ac.jp/index_e.html

Our research fields include medical engineering 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
- Blood trauma 3D real-time measurement
- Implantable microcirculation observation probe
- Neural interface
- Laser surgery and medicine



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



Neuroscience

Neuropathology

http://www.neupath.m.u-tokyo.ac.jp/

To elucidate the molecular mechanisms underlying neurodegeneration and neuronal death observed in Alzheimer's disease (AD) brains, we have been undertaking studies on production, degradation, and deposition of amyloid β protein (A β) and tau, and analyses of animal models.

- Molecular mechanisms of A β production through γ -cleavage
- Effect of membrane lipids on Aβ production and deposition
- Intracellular trafficking of APP and $A\beta$
- Regulation of A β production
- Protein chemical analysis of Aβ accumulated in AD brains
- Degradation of tau under physiological conditions
- Protein chemical analysis of tau deposited in AD brains
- Morphological and biochemical analyses of mutant tau transgenic mice
- Expression of mutant tau and neurodegeneration in *Caenorhabditis elegans*



ApoE4, a risk factor for AD, enhances Aβ42 accumulation

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 nucle-us-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).

Cognitive Neuroscience

The laboratory aims to investigate the neural mechanisms of language, cognition, and memory, and we have been working in the field of brain and cognition.

- Research on brain damaged patients: callosal syndrome, right temporal lobe syndrome, macular sparing, aphasia therapy
- Functional magnetic resonance imaging (fMRI) during the cognitive process: mental writing, writing, face recognition, reading comprehension, naming, reading aloud
- fMRI study on speech dominance in split-brain patients
- Magnetoencephalography (MEG) study of cognitive function: visual evoked magnetic fields, motor imagery
- Brain mechanism of Japanese kanji processing



Differences in brain activity in word reading in relation to visual field of presentation

Speech Physiology -

Apahsia, apraxia, agnosia, memory disturbance, and dementia cause devastating impairments in daily activities. The goal of our study is to promote the cognitive rehabilitation. To do so, we are

investigating the mechanism of those disorders. We also are studying the brain mechanisms of speech using functional magnetic resonance imaging. We focus on the activities of the left inferior frontal gyrus. Another theme of our laboratory is to explore the neural mechanism of visual word recognition and auditory speech perception by the combined use of priming method and functional magnetic resonance imaging/transcranial magnetic stimulation/magnetoencephalogram in normal humans.

- Research on brain damaged patients:
- Aphasia agnosia apraxia memory disturbance dementia
- Functional magnetic resonance study of brain mechanism of speech production
- Brain mechanism of word recognition: functional architecture and plasticity



MRI of a patient with selective impairment of auditory-verbal short-term memory. Notice the absence of the recency effect.

Neuropsychiatry

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

Our department has provided a leading role in biological psychiatry of stress-related disorders and schizophrenia. Recently, we have promoted cutting-edge biological studies of pervasive developmental disorders.

- Genetic, molecular, and neuroimaging studies of pervasive developmental disorders
- Molecular biology of epilepsy and stress-related disorders
- Genetic studies in schizophrenia, autism, and anxiety disorders
- Multimodal neuroimaging studies of schizophrenia, PTSD, and autism
- Clinical psychopharmacology
- Molecular studies in sleep-related disorders
- Clinical studies on dementia and schizophrenia



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

Neurology

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

Our Department is 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 pathopysiology 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-



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

The 21st century has been designated as "The Century of the Brain". To lead Japanese Surgical Neuroscience, we have devoted our activities to the following: advanced Clinical Neurosurgery, Neuroscience Research and Graduate and Postgraduate education.

- Advanced Clinical Neurosurgery
 - Skull base surgery in managing benign or malignant skull base tumors and cerebrovascular disorders
 - Advancement of less invasive surgical techniques to maintain the quality of life (QOL) of patients : application of endoscopy and γ -knife radiosurgery
 - Development of new therapeutic strategies for malignant glioma
 - Functional neurosurgery including epilepsy surgery
- Neuroscience Research
 - Application of stem cells in regenerating damaged neuronal networks
 - Treatment of brain tumors using conditionally replicating virus vectors and nano drug delivery systems
 - Tailor-made therapy of malignant brain tumors using genetic analyses



Endonasal endoscopic pituitary surgery under navigation guidance





Social Medicine

Molecular Preventive Medicine

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

Chemokines play critical roles in the pathogenesis of diseases including acute inflammtaion, 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, promoting health, and quality of life (QOL) through organized community effort. Through studies in various fields and laboratories, our department aims to advance research, sup-

port 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)



A Malay farmer with a pesticide sprayer on his back and a tobacco farm, subjects of one of our health surveys

Forensic Medicine

http://plaza.umin.ac.jp/~forensic/

Our practice is to determine the cause of unusual death by autopsy and examinations. For the progress of the practice, we are pursuing molecular pathological studies on sudden cardiac death and sociomedical studies on the death investigation system and risk management.

- Ischemic death of cardiomyocyte
- Toxic or protective role of carbon monoxide
- Oxidative stress and lipid peroxidation in pathogenesis
- Law and system of death investigation and medical risk management
- Analytical toxicology



Forensic autopsy room

Medical Informatics and Economics

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

The department continually develops and manages the entire clinical and administrative information system of the University of Tokyo Hospital such as hospital management works. The research and postgraduate education programs cover basic medical informatics, advance applications of information technology to clinical medicine, technology assess-

ment and standardization of healthcare information.

- Development of the new architecture of our hospital information system is based on distributed computing technology
- Development of intelligent computer-based medical record systems
- Standardization of medical terminology and communication protocol for electronic exchange of healthcare information
- Patient-centered medical information systems
- Development and management of a clinical data collection system using the University Hospital Medical Information Network(UMIN)



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, 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





Intraventricular mapping using the NOGA system

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 liver injury mechanisms in viral hepatitis
- Prevention of and development of a better therapeutic modality for hepatocellular carcinoma
- Elucidation of gastric injury mechanisms by Helicobacter pylori
- Clarification of colon disease, especially right-sided colon carcinogenesis
- Development of an earlier diagnostic strategy for pancreatic cancer: search for its high-risk group by using SNP (single nucleotide polymorphism) analysis
- Development of a better endoscopic therapeutic modality for pancreatobiliary cancer/stone
- Development of an endoscopic *en bloc* resection method for early gastric cancer
- Elucidation of the mechanisms of and development of a therapeutic strategy for hepatic fibrosis
- Clarification of mechanisms of liver regeneration

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 is it 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 aproach since hypertension is closely related with both nephrology and endocrinology.

- Renal physiology and morphology
- Pathophysiology of immune-mediated renal injury
- Analysis of pathophysiology and prognistic 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, RNA technology, human genetics, clinical epidemiology and bioinfomatics. Our major goal is to develop mechanism-based fundamen-

tal 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.



Hematology and Oncology-

http://www.h.u-tokyo.ac.jp/mukin/E-index.htm

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. 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
- Establishment of *ex vivo* expansion of hematopoietic cells
- Genome-wide analyses of hematological malignancies
- Identification of molecular pathogenesis of leukemia
- Analyses of the immune system by developmental biology
- Establishment of antigen-specific immunological therapeutics against cancer
- Development of therapeutic strategies for GVHD by engineered immune cells



Transcription factor AML1 in normal hematopoiesis and leukemia

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 diseaes, in particular, on HIV infection and hepatitis viral infections, the latter of which is the major cause of liver diseae worldwide. Our research topics cover the wide areas in microbiology, immunology and pathobilology 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 cytomegaluviral infection
- Mechanism of multi-drug resistant microorganisms





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Stress Sciences and Psychosomatic Medicine

Targeting stress-related diseases such as psychosomatic and lifestyle-related diseases, we are investigating their pathophysiology and psychopathology through assessing higher brain function, autonomic nervous function, and bio-psycho-behavioral time-series data. We are also actively conducting basic as well as clinical research on stress and relaxation responses and eating-related substances.

- Elucidation of brain processes closely related to mind/body correlation in stressrelated diseases by use of brain functional analysis methods such as positron emission tomography, magnetoencephalography, and event-related potentials
- Investigation into the pathophysiology, psychopathology and neurobehavioral basis of stress-related diseases by use of ecological momentary assessment methods
- Behavioral scientific studies and interventional studies using psychobehavioral treatment procedures on stress-related diseases
- Development and clinical application of questionnaires concerning mental health
- Interventional studies of various relaxation procedures
- Psychophysiological and biochemical studies on stress responses and relaxation responses
- Investigation on the effects of newly-found neuropeptides such as orexin and ghrelin in the brain particularly on emotion and stress responses

Clinical Laboratory Medicine –

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.

- Cell surface analysis and quantification of cell surface antigens using flow cytometry
- Elucidation of pathophysiological roles of lysophospholipid mediators, and its application to laboratory medicine
- Platelet biology
- Research on adrenomedullin
- Oxidative stress and organ damage
- Analysis of the function of the left ventricle 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-tky/

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. Especial 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



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



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

Perinatal Medicine

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

The researches are on going for development of precise prenatal diagnosis on the fetal status using ultrasonography, and for investigation of fetal physiology using animal models. We are also focusing

on the immunological aspects in patho-physiology of pregnancy, developing the immunotherapy for habitual abortion or gestational toxicosis.

- Early diagnosis of abnormal pregnancy
- Development of three dimensional ultrasonography
- Experimental fetal physiology
- Immunotherapy for pregnancy
- 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 and Developmental Pediatrics

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

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 with various respiratory surgical problems that are difficult to treat in other institute.

- The development and differentiation of the fetal lung
- Fetal diagnosis of congenital malformations
- Fetal surgery and treatment
- Probiotics and prebiotics applied to padiatric 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
- Surgical treatment of pediatric respiratory malformations



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

Geriatric Medicine

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 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 550. 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 surgery
 - Valve or vascular tissue allograft transplantation
 - Ventricular assist device for end-stage heart failure
 - Pathophysiology of thymoma
- Basic and experimental research
 - Development of real-time 3D echo
 - Development of myocardial regeneration therapy
 - Analysis of resistance to infection of tissue allograft
 - Analysis of suppressor gene of lung cancer



MRI diffusion-weighed 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 interconnections. 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
 - Chemoprevention of gastric cancer with PPARγ ligand
- 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 neaoadjuvant chemotherapy and improvement of survival
 - Estimation of chemotherapy effects by new bio- and genetic-markers
 - Alternative gastrointestinal reconstruction and estimation of the results



Bone marrow cell homing into gastric mucosa of Helicobacter infected mouse

Hepato Biliary Pancreatic Surgery-

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

We constantly perfom nearly 200 hepatectomies every year on patients with hepato-biliary 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
- Study of the underlying mechanisms of acute pancreatitis using rats
- The prediction of recurrence of hepatocellular carcinoma by measuring AFP mRNA in the peripheral blood
- Induction of hepatocyte differentiation from bone marrow cells

Urology -

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

We constantly perform more than 1,000 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 noncancer 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
- 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
- Clinical investigation for urinary incontinence and overactive bladder (Fig.2)

Artificial Organ Transplantation Division

We have performed liver transplantation for end staged liver diseases. Until March 2005, we have experienced 417 cases of living donor liver transplantation and two deceased donor liver transplantation case.

- Surgical technique on living donor liver transplantation
 - Right lateral sector graft
 - Criteria and technique on middle hepatic vein reconstruction in right liver graft
 - Vascular reconstruction using homograft vein
- Diagnosis on acute rejection
- Artificial Organ
 - Artificial Liver



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



veno-occlusive area. Bone marrow cells from the GFP transgenic mouse differentiated into hepatocytes by coculture with nonparenchymal liver cells.

ative Doppler ultrasonograph

after transection of the middle hepatic vein. Portal flow was hep-

atofugal (shown in blue) in the

Bone marrow derived GFP positive cells expressed albumin



Fig.1 Cause Specific Survival (EMP monotherapy); chemotherapeutic effect according to time to nadir (PSA)



Fig. 2 It is clearly shown by histology that the thickness of muscle is significantly reduced and correlated with symptoms in stress incontinent women.





The 5-year survival rate in our 248 adult patients who underwent living donor liver transplantation was 84%, which was much higher than overall Japan series (70%).

Color flow mapping of intraoper-

Surgical Oncology / Vascular Surgery

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
 - Detection of sentinel lymph nodes using magnetic particle
 - 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

Metabolic Care and Endocrine Surgery -



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

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 200 cases of breast, thy-

roid 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

Dermatology

- 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
- Apoptotic gene expression in endocrine neoplasm
- Roles of carbohydrate in breast cancer metastasis
- Establishment of evaluation on QOL of the patients with breast cancer



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

Our department performs very varied of basic and clinical research concerning the cutaneous immune system that is orchestrated by Langerhans cells, pathogenesis of skin fibrosis in the scleroderma, and mechanism of growth and metastasis of skin cancers (especially in malignant melanoma). Our specific interest is to develop new therapeutic approaches to the relevant skin diseases using the knowledge we obtain through the data generated by our research.

- Molecules of Langerhans cells that regulate antigen presentation
- The role of chemokines in allergic skin diseases
- Understanding and clinical application of the regulatory mechanisms of allergy inducing factors produced by the epidermis
- Understanding and clinical application of mechanisms of up-regulated expression of the type I collagen gene in scleroderma fibroblasts
- \bullet The role of transforming growth factor- β Smad signaling in fibrosis
- \bullet The role and signal transduction of transforming growth factor- β receptors in dermal fibroblasts
- The mechanisms of up-regulated expression of integrins in fibrosis
- Mechanisms of growth and metastasis in malignant melanoma cell lines
- Early diagnosis of metastatic lymph nodes by the sentinel lymph node biopsy technique
- Early diagnosis of malignant melanoma with dermoscopy



Axillary sentinel lymph node in patients with chest malignant melanoma (2% patent blue staining)

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

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
 - Microsurgical reconstruction using vascularized tissue transfers
 - Reconstructions for established nerve palsy
 - Cranio maxillo facial surgery
 - lymphedema

Oral and Maxillofacial Surgery -



Microsurgical lymphaticovenular anastomosis(0.5mm) for human arm lymphedema

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:
 - Mandibular lengthening by distraction osteogenesis
 - 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
- 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
 - Mandibular lengthening by the floating bone method



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.

- Bone, cartilage and nerve regeneration
- Regulation of anabolic and catabolic bone metabolism by cytokines (FGFs, PGs)
- Molecular mechanism of age-related bone loss (klotho, PPARy)
- Molecular mechanism of osteoclast differentiation and apoptosis (RANKL-RANK, INF, Src)
- Reverse and forward genetic approach to the pathophysiology of bone and cartilage disorders (osteoarthritis, OPLL)
- 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

Ophthalmology

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

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 octual circulation in gradeonia and retinal diseases
 Analysis of corneal topographyand wave-front analysis of optical aberrations
- Analysis of conteat oppgraphyand wave-none analysis of optical adertations
 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



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

Chochlear implant

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 congenial 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
 - Basic research on auditory brainstem implants
 - 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 healing

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

- Measurements of 3 dimensional ground reaction forces with a force platform
- Measurements of foot pressures with a computerized insole sensor system
- 2-dimensional image analysis with a video camera system
- Cognitive Rehabilitation
 - Functional localization using event related potential and MEG
 - Simple evaluation system of higher brain dysfunction
- Clinical and biological study on disuse syndromes
 - Joint contracture and disuse atrophy in molecular biology
 - Development of a proper program for recovery from deconditioning



2D sagital gait analysis

Anesthesiology

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

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 perfomed 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 inhalated anesthetics

• An esthesia 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

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





Anesthesia and monitors



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 professionalpatient relationship and patient autonomy
- Studies on the effects of changes in industrial society on "Ways of Working and Living" and fatigue / stress among wokers
- Studies on social differences and inequalities in health
- Studies on theory and research methodology on the lives of ill and disabled people and their families



An example of a visual presentation on research results

Mental Health / Psychiatric Nursing

Both departments conduct internationally diverse clinical studies on mental disorders and mental health problems.

• Mental Health

- Psycho-education in mental disorders
- Evaluation of psychiatric services
- Evaluation of school counseling
- Practice and Evaluation of Psychotherapy
- Early detection and therapeutic education of PDD
- Psychiatric Nursing
 - Workload studies of acute psychiatric wards
 - Clinical competency of psychiatric nursing
 - Skills of community psychiatric nursing
 - Mental health of mothers and child abuse
 - Carer burden



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-initiat-

ed 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
- Analysis of microarray data
- 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



Multivariate analysis of cDNA-array data

Social Gerontology

http://www.sg.m.u-tokyo.ac.jp/informatione.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

Health Promotion Sciences



Class meeting of the department

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

The main activity of the Department of Health Promotion Sciences is making health policy proposals concerning health promotion in the community and work place through experimental and survey research. The main research fields are health behavior and life-style related disease. The main focus of health behaviors are physical activity including exercise, diet and nutrition, and obesity. Our classes

include lectures and practical training with the aim of helping students to understand the method of planning, implementation and evaluation of the health promotion programs in the community and work place.

- Development of effective health promotion programs
- Assessment of the supportive environments in the community and work place
- Assessment of and supporting methods for health behavior, and the impact on health status
- Short and long term effects of behavior change
- Influence of behavior change on medical costs, and cost effectiveness analysis
- Determinants in the social and physical environment on the adherence of behavior change



Physical fitness test as part of a community health promotion program

Biomedical Ethics

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

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

- 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 Sciences

Nursing Administration/ Advanced Clinical Nursing

http://nurs-adm.m.u-tokyo.ac.jp/

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.

- Assessment and improvement of quality of nursing care
- Outcome management for nursing practice
- Risk management in acute care settings
- Nursing case management and critical pathways
- Cost-effectiveness of nursing services
- Patient classification systems
- Physiological studies of clients'/caregivers' activities
- Occupational safety and health of health care workers
- Nursing policy and strategies to meet the professional demands

Adult Nursing / Palliative Care Nursing



Promoting quality nursing care

http://www.adng.m.u-tokyo.ac.jp/indexe.htm

Mainly for subjects in their adulthood, we have been performing research in a variety of domains including prevention of cancer 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.

- Care for adaptation to physical alteration after surgery
- Cancer genetic counseling in nursing
- Physical activity in middle- aged / elderly
- Prevention and self care support for family with diabetes
- Symptom management for inflammatory diseases
- Evaluation of palliative care services
- Spiritual care for terminally ill persons and their families
- Continuity and dissemination of palliative care
- Nursing care system for out patients
- Nursing terminology



Family Nursing

http://www.hn.m.u-tokyo.ac.jp/dept/famn/indexj.htm

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
- Child abuse
- Care of dying children and their families
- Qualitative research to explore childbearing family formation process
- Postnatal depression and difficulties in childrearing





Community Health Nursing

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

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 and terminology of community health nursing.

- 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
- Development of health care programs
 - Support for families with babies and children
 - Occupational health
 - Elderly care
- Definition and standardization of skills of public health nurses/ Development of community health program
- Terminology of community health nursing

Midwifery and Women's Health -

All levels of health Public Health Community Health Nursing Concepts of the Community Health Nursing

Development of Care Program Establishment of Community Health Care System

cople in the community

Individuals, Families zgregates, Communit

http://park.itc.u-tokyo.ac.jp/midwifery/index1eng.htm

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
- Quality of sleep and sleeping posture of women
- Promotion of women's health care after delivery and during menopause
- Application of the ICF (International Classification of Functioning Disability and Health) to an assessment of quality of life among pregnant women



Photo by Sakae Kikuchi

Gerontological Nursing

http://www.rounenkango.m.u-tokyo.ac.jp/english/

Our main study involves the "Practice and Development of Gerontological Nursing Based on Evidence" where we are striving to develop new nursing techniques and instruments to improve the prediction, prevention, diagnosis and treatment of the elderly. We hope to increase their physical activity and enhance self-esteem in order to maintain their independent lifestyle.

- Development of new techniques and instruments for wound care
 - management for the elderly
 - Risk assessment
 - Preventive care
 - Malnutrition
 - Skin care technique
 - Wound management
- Development of care programs and systems for the elderly
 - Health promotion program for the healthy elderly
 - Preventive approach in long term care for the frail elderly
 - Care program and system for the demented elderly







International Health

Health Policy and Planning-

The department aims to provide the scientific evidences to the international health policy in the world, especially in Asian countries. Our long-termed goal is to contribute, through our researches, to establishing the world where we can live healthy, in harmony with nature by respecting each of our cultures and beautiful environments.

- Evaluation of ODA and international health policy
- Sustainable IMCI (Integrated Management of Childhood Illness) in developing countries
- Appropriate interventions for the sustainable malaria prevention
- Situational analysis on immunization service (EPI) in developing countries
- \bullet HIV/STIs , AIDS control and prevention
- Injury prevention in developing countries
- Allergic disease or paediatric asthma in developing countries
- Medical wastes in developing countries
- Reproductive health in developing countries
- Health system improvement in developing countries

International Community Health



Mass vaccination campaign during National Immunization Days for poliomyelitis eradication

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

Our aim is to bring together aspects of clinical, public health and social science research to address the broad issues of health and health care: 1) to investigate how to change the status quo by improving health status of the most vulnerable; 2) to undertake research on the influences of 'globalization' on

health and social development; 3) to investigate the mechanisms to reduce inequalities between and within nations on health and development; and 4) to develop the mechanisms to link the above 4 goals with the individual research activities described below.

- Maternal and child health in Asian countries
- Infectious diseases such as tuberculosis, leprosy and HIV/AIDS
- Appropriate treatment and prevention of common diseases and injuries including traffic accidents in Japan and developing countries
- Health promotion
- Comparative study on dental health and care between different countries
- Stroke prevention in developing countries as well as in Japan
- Environmental degradation related diseases such as "ecological diseases" in Kazakhstan, and bronchitis and asthma in children in Bangladesh
- Health policy: "SAPs", "health sector reform", "SWAps" (SIP) in developed and developing countries
- Human rights including: 1) Code of conduct, 2) Refugees and 3) War and conflicts
- Disaster relief/medicine



Health for All! Questioning the Solution The Politics of Primary Health Care and Child Survival. D. Werner and D. Sanders. 1997

Human Genetics

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

Department of Human Genetics is broadly interested in the human genome diversity, especially in the Asian populations. Specifically, we are using genomic research tools including SNP and microsatellite analyses, as well as gene expression profiling, to better understand the genetic background of a variety of complex diseases, especially autoimmune 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.
 - Genomic studies to the understanding of genetic background and pathogenesis of autoimmune 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 -

At its inception, the name of the department was the "Department of Maternal and Child Health". The studies involved in all activities related to the maintenance and the promotion of health of mothers and children, including research of infectious diseases and nutrition.

In 1992, with the aim of expanding the vision of research and teaching activities, the name was changed to the "Department of Developmental Medical Sciences". In addition to maternal and child health, the theme thus extended to include aging, human-environment relations and areas of reproductive health.

- Field study of maternal and child health
 - Minority group inside and outside of Japan
 - Obesity, minor nutrients etc

Human Ecology -

- Molecular epidemiology of infectious diseases
 Diarrheal viruses, HIV, hepatitis viruses etc
- Development of diagnosis of infection (genetic analysis, immunological analysis)
- Physiological and biochemical study of child development
- Hormone and bone metabolism in puberty, during pregnancy and puerperium and in post-menopausal state
- Biochemical analysis of immobilization on calcium and bone metabolism
- Effect of urbanization on maternal and child health (high rise living, child-abuse, social epidemiology of infectious diseases)



The preparation of norovirus capsid protein (virus-like particle) by molecular biological technique for development of a rapid test of norovirus infection

http://www.humeco.m.u-tokyo.ac.jp/index-e.html

For the purpose of elucidating the health and survival of human populations from the human-environment relationship, field investigations in the Asia-Pacific region and experimental studies have been conducted. Based on not only biomedical aspects but also environmental scientific and socio-cultural aspects, many international health problems are targeted.

- Health effects of environmental arsenic and possible mitigation strategy in South Asian countries
- Exposure-effects evaluation of chemical pollution of watershed in rural Indonesian children
- Nutritional ecology-based health evaluation for Asia-Oceania populations
- Nutritional adaptation in rural and urban-dwelling populations in developing countries
- Development and environmental preservation in rapidly-changing Asia-Oceania communities
- Effects of perinatal exposures to heavy metals or endocrine disrupting chemicals on neuro-behavioral development
- Modification of the effects of environmental chemicals by nutrients and nutritional status



Children of Paradise village, Western Province, Solomon Islands

Biomedical Chemistry-

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 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*: succinate dehydrogenase complex and regulation of energy supply
- RNA and RNA-binding proteins
- Mitochondriral translation system
- Ribosome 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)





Center for Disease Biology and Integrative Medicine

Basic Medical Sciences (1) / 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 priori-

ties 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 tumorgenesis by modulating apoptosis and cell cycle; via analysis of DEDD-deficient animals.



Basic Medical Sciences (2) / Biophysics

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

We have been exploring two-photon excitation microscopy, which utilizes an infrared femtosecondpulsed 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

Biomedical Materials and Systems

http://park.itc.u-tokyo.ac.jp/tissue/ http://envchem.iis.u-tokyo.ac.jp/ http://www.cdbim.m.u-tokyo.ac.jp/english/index.html

Ushida Lab investigates regenerated cartilage, bone and blood vessel in combination of 3D scaffold technologies and tissue engineering. We also focus on the elucidation of cellular mechanism of sig-

nal transduction evoked by physical stimulations such as stretching, shear and hydrostatic pressure. Sakai Lab tries to develop novel experimental systems or devices for clinical or diagnostic applications and those for evaluation of environmental impacts on humans based on the approaches of chemical system engineering and on cultivation of human organ-derived cells in different scales, towards the final goal, "human body system engineering".

- Biodegradable polymers, bioceramics for tissue engineering
- Regenerated cartilage, regenerated bone and regenerated blood vessel
- Elucidation of signal transduction mechanism responding to physical stimulations
- Engineering of human large internal organs
- Evaluation of toxicological responses in humans using in vitro model organs
- Bioassay-based environmental assessment and management

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 intelligent polymer gel systems responding to external stimuli
- Development of highly sensitive bioassay systems based on PEGylated gold nano-particles
- 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-



The manifestation of diseases having modulation of advance brain function, endocrine system and immune system is known to be induced not only by 'internal environmental' factors, but also by 'external environmental' agents such as environmental chemicals. In order to provide scientific basis for health risk assessment of environmental chemicals by focusing upon children's health, we implement the mission of our division to characterize possible health effects of environmental hazardous chemicals and to clarify the toxicity mechanism with an integrative spectrum from the individual to molecular levels.

- Elucidation of the mechanism of toxicity of environmental hazardous chemicals, such as dioxins/PCBs and heavy metals at the molecular and cellular levels
- Clarification of the molecular basis of difference in susceptibility to toxic chemicals among strains of a particular animal species as well as among different animal species.
- Development and application of toxicity evaluation techniques at whole body, cells and molecular levels
- Development of risk assessment methodology to set up safety guidelines on the environment and food







Tissue Engineering & Organ Engineering

Animal Research

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

All researchers are accountable for paying attention to "3R" in animal experiment. We give the researchers advice on their animal experiment plans and manage the facility of laboratory animals so that animal experiments are carried out in consideration of animal welfare. We also teach laboratory animal science to medical undergraduates. Research activities are the development of methods to detect trace amount of antigen and the study of interaction between host and parasite in proto-zoan disease.

- Histopathological diagnosis of BSE using nucleic acid signal amplification technique
- Improvement of immuno-PCR technique
- Investigation of the malaria redox system using mouse malaria model



Immunofluorescence stain of Golgi apparatus and tight junction in Vero cells using nucleic acid signal amplification technique.

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 nonhomologous 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, our division performs management of the research network and the central servers of the Graduate School of Medicine, and basic research of medical informatics (medical terminology and standardization of medical vocabularies), privacy and anonymizing of personal information, security of research network, distributed processing system for medical information.

- Biomedical research support using network system
- Standardization of medical vocabularies and coding system
- Biomedical terminology and ontology
- Security of biomedical research network
- Privacy of personal data in medical research
- Distributed processing system for medical information using the internet



Computer System for Biomedical Research





Central Clinical Facilities

Clinical Laboratory Center -

http://www.h.u-tokyo.ac.jp/patient/depts/kensa.html

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
- Analysis and quantification of cell surface antigens using flow cytometry
- 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 function 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. Incidentally, last two years, operations were performed 7566 in 2003 and 7546 in 2004.

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, disinfecion 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 devises
- Development of new surgical instruments and medical devises
- Three-dimensional processing of visual information



University hospital Medical Information Network Center (UMIN Center)

UMIN is the largest and most versatile academic medical information center in the world with 230 thousands registered medical professionals and 25 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)
 - Web-based Quality Management system of Educational effectiveness (Web-QME)

• Major research activities

- Information systems for clinical and epidemiological research
- Evaluation of medical schools and university hospitals
- Library and information science
- Network security

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Pharmacy

Pharmaceutical Department -

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

Our goal is to provide optimized pharmacotherapy for each patient, by analyzing and predicting individual pharmacokinetics, drug sensitivity and drug adverse reaction. We are now studying the regulatory mechanism of gene expression/function as well as the genetic polymorphism of drug transporters, drug metabolizing enzymes and particularly lipid transporters related to life style-related diseases.

- Transporters involved in drug absorption / distribution / excretion.
- Transporters involved in lipid homeostasis.
- Analyses of genotype and phenotype of drug metabolizing enzymes and transporters.
- Strategies for accurate prediction of drug disposition, and pharmacokinetic/pharmacodynamic (PK/PD) studies (vancomycin, tacrolimus, etc)



Therapentic drug monitoring



Health Service Center-

Health service center provides various annual health-checkups, health counselling and education to the students and university staff. We also provide clinical services at our outpatient clinics. Our search divisions are targeting elucidation of predictive factors of various diseases, presymptomatic diagnosis of fatal diseases and mechanisms of common disorders in young adults.

- Health management
 - Annual health-checkups for students and the university staff
 - Health counseling and education
- Clinical services at our outpatient clinics, including Internal Medicine, Psychiatry etc.
- Research divisions
 - Genetic and MRI diagnosis of cardiovascular diseases
 - Genetic mechanisms of psychiatric disorders
 - Predictors of malignancy in the stomach
 - Hypertensive genes and hemodynamics in the ocular fundi
 - Genetic analysis of asthma
 - Immune responses and cardiovascular disorders
 - Predictors of forthcoming cognitive dysfunction in the elderly

PCR-RLFP*štc.L53209-=>2/46± *(Restriction Fragment Length Polymorphisms)

The stepwise-determination of genetic polymorphism responsible for cardiomyopathy

The International Research Center for Medical Education and Research

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

The International Research Center for Medical Education was installed as a joint educational study institution to promote interdisciplinary research on medical education and international cooperative studies in relation to medical education. This center consists of three sections: the medical educational international cooperation enterprise plan coordination and information section: and the guest professor section.

- Medical education theory / method
- Medical education curriculum / technique / evaluation
- Needs of medical educational international cooperation
- Strategies for international cooperation in medical education
- Evaluation method of international cooperation enterprises in medical education
- International cooperation in the field of medical education, drafting, enforcement
- Network formation to promote international cooperation in the field of medical education
- Database development study on international cooperative information in the field of medical education



Prof. Noel (Oregon Univ.) at his final lecture





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