THE INSTITUTE OF MEDICAL SCIENCE

THE UNIVERSITY OF TOKYO

2024

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August 2024

Serving Global Welfare with Comprehensive Knowledge

The Institute of Medical Science, The University of Tokyo (IMSUT) was originally founded in 1892 by Dr. Shibasaburo Kitasato as the Institute of Infectious Diseases. The Institute was incorporated into the University of Tokyo in 1916 and was reorganized as IMSUT in 1967. With a history spanning over 130 years from the Meiji era to the Reiwa era, IMSUT explores the fundamental principles of biology and disease, develops innovative methods of treatment and prevention, and implements these methods to contribute to the development and welfare of society. To this end, the research environment at IMSUT is focused on producing comprehensive knowledge of medical science that integrates a wide variety of disciplines, including medicine, pharmacy, science, engineering, agriculture, information science, ethics, and public policy. In this research environment, individual researchers and medical professionals carry out original research and develop technologies based on their own intellectual curiosity. To overcome diseases that threaten humanity, including infectious diseases, cancer, and intractable diseases such as immunological, neurological, and muscular diseases, we have established a system that integrates basic life science research, project-based translational research, and the development of advanced medicine at IMSUT Hospital, the only national university-affiliated hospital in Japan.

IMSUT has three core research departments that explore the principles of biology: the Department of Basic Medical Sciences, the Department of Cancer Biology, and the Department of Microbiology and Immunology. In addition, to promote translational research that implements the diverse results of our core research in society, we have established seven centers and five research facilities, including the Human Genome Center, which houses Japan' s largest supercomputer dedicated to the life sciences (SHIROKANE), and the Advanced Clinical Research Center. At our affiliated hospital, clinical trials and advanced medical care based on the research results produced by IMSUT are conducted in close collaboration with local medical practitioners.

In November 2018, IMSUT was accredited by the Ministry of Education, Culture, Sports, Science and Technology as an International Joint Usage/Research Center, the only one in the country in the field of life sciences. After receiving the highest rating of "S" in the year-end evaluation for FY2021, the project entered its next phase in FY2022. Currently, approximately 1,000 faculty members, administrative, technical and hospital staff, and researchers, including more than 200 students affiliated with eight graduate schools, work at the Shirokanedai campus, as well as at the Research Center for Asian Infectious Diseases (Beijing) and the Amami Laboratory of Injurious Animals (Amami Oshima).

Makoto Nakanishi, M.D., Ph.D.
Dean

THE INSTITUTE
OF MEDICAL SCIENCE
THE UNIVERSITY
OF TOKYO

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Dean
Professor Makoto Nakanishi

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Vice Dean for General Affairs
Professor Mutsuhiro Takekawa
Vice Dean for Research Support
Professor Seiya Imoto
Vice Dean for Finance
Professor Yasushi Kawaguchi
Vice Dean for Hospital Management
Professor Atsushi Iwama

Research Departments

Department of Microbiology and Immunology
Chair Professor Kensuke Miyake

- Division of Infectious Genetics
- Division of Molecular Virology
- Division of Vaccine Science
- Division of Malaria Immunology
- Division of Systems Virology

Department of Cancer Biology
Chair Professor Yuji Yamanashi

- Division of Genetics
- Division of Cancer Cell Biology
- Division of Aging and Regeneration

Department of Basic Medical Sciences
Chair Professor Toshifumi Inada

- Division of Cell Signaling and Molecular Medicine
- Division of RNA and Gene Regulation
- Division of Protein Metabolism

Research Facilities

Human Genome Center
Director Professor Seiya Imoto

- Laboratory of Genome Database
- Laboratory of Molecular Medicine
- Laboratory of Genome Technology
- Laboratory of Sequence Analysis
- Laboratory of Functional Analysis *in silico*
- Department of Public Policy
- Division of Medical Data Informatics
- Division of Health Medical Intelligence
- Division of Metagenome Medicine
- Division of Digital Genomics

Center for Experimental Medicine and Systems Biology
Director Professor Tomoji Mashimo

- Laboratory of Innate Immunity
- Laboratory of Reproductive Systems Biology
- Laboratory of Genetically Engineered Mouse Research
- Division of Genome Engineering
- Division of Cell Regulation
- Core Laboratory for Developing Advanced Animal Models

Advanced Clinical Research Center
Director Professor Fumitaka Nagamura

- Division of Infectious Diseases
- Division of Clinical Genome Research
- Division of Innovative Cancer Therapy
- Division of Advanced Medicine Promotion
- Division of Advanced Genome Medicine
- Division of Bioethics
- Division of Frontier Surgery
- Division of Hematopoietic Disease Control
- Division of Advanced Gastroenterology and Endoscopy
- Division of Anesthesia and Surgical Homeostasis
- Division of Hematology and Tumor Biology

Center for Stem Cell Biology and Regenerative Medicine
Director Professor Hideki Taniguchi

- Division of Regenerative Medicine
- Division of Stem Cell and Molecular Medicine
- Division of Stem Cell Transplantation
- Division of Stem Cell Processing
- Division of Mammalian Embryology
- Division of Stem Cell Aging Medicine
- Division of Somatic Stem Cell Research
- Division of Cell Engineering
- FACS Core Laboratory
- Stem Cell Bank

International Research Center for Infectious Diseases
Director Professor Yasushi Kawaguchi

- Department of Special Pathogens
- Department of Infectious Disease Control (Division of Viral Infection)
- Pathogenic Microbes Repository Unit

International Vaccine Design Center
Director Professor Ken Ishii

- Human Immune-Profiling Team (Division of Systems Immunology)(Division of Human Immunology) (Division of Infection Immunology)
- New Dimensional Vaccine Design Team (Division of Vaccine Engineering)(Division of Adjuvant Innovation) (Division of Mucosal Vaccines)(Division of Immunology and Genomics)

Center for Gene & Cell Therapy
Director Professor Takashi Okada

- Division of Molecular and Medical Genetics

Laboratory Animal Research Center
Director Professor Tomoji Mashimo

- Division of Animal Genetics
- Animal Center

Amami Laboratory of Injurious Animals
Director Professor Tomoji Mashimo

Medical Proteomics Laboratory
Director Professor Mutsuhiro Takekawa

Research Center for Asian Infectious Diseases
Director Professor Yasushi Kawaguchi

Laboratory of Molecular Genetics
Director Professor Makoto Nakanishi

(Frontier Research Unit)

IMSUT Distinguished Professor Unit

- Division of Virology

IMSUT Hospital

Director Professor Tomoki Todo
Deputy Director Professor Yasuhito Nannya

Medical Care Unit

Departments of Internal Medicine

- Department of Hematology/Oncology
- Department of Infectious Diseases and Applied Immunology
- Department of Rheumatology and Allergy
- Department of Applied Genomics
- Department of Radiology
- Department of Palliative Medicine and Advanced Clinical Oncology
- Department of Oncology and General Medicine
- Department of Diagnostic Pathology
- Department of Gastroenterology

Departments of Surgery

- Department of Surgery
- Department of Anesthesia
- Department of Joint Surgery
- Department of Surgical Neuro-Oncology
- Department of Urology

Care Support Unit

- Department of Medical Informatics
- Department of Radiological Technology
- Department of Cell Processing and Transfusion
- Surgical Center
- Department of Medical Supply Center
- Department of Laboratory Medicine
- Department of Pathology
- Department of Clinical Genomics
- Department of Clinical Nutrition
- Radiation Control Office
- Regional Medical Liaison Office

Clinical Safety and Infection Control Unit

- Center for Clinical Safety and Infection Control

Clinical Research Support Unit

- Center for Translational Research
- IMSUT CORD
- Therapeutic Vector Development Center

Department of Nursing | Department of Pharmacy | Department of AIDS Vaccine Development

Corporate Sponsored Research Program, Social Cooperation Research Programs

- Project Division of RNA Medical Science
- Project Division of International Advanced Medical Research
- Project Division of Advanced Biopharmaceutical Science
- Project Division of Genomic Medicine and Disease Prevention
- Project Division of Clinical Precision Research Platform
- Project Division of Innovative Diagnostics Technology Platform
- Project Division of Oncolytic Virus Development
- Project Division of Generative AI Utilization Aging Cells

Consortium

- Consortium for Gene Therapy and Regenerative Medicine

Common Research Facilities

Technical Office

Dean's Office

Administration Office

General Manager Keitaro Sudo

- Administrative Affairs Division — **Manager** Yoko Akutsu
- Research Support Division — **Manager** Yuji Takayama
- Hospital Division — **Manager** Masaaki Ozaki

IMSUT Historia

Institute for Infectious Diseases

1892
Foundation of the Institute for Infectious Diseases (IID), as a private institute by Dr. Shibasaburo Kitasato

1894
Relocation to Atagocho, Shiba-ku and opening of the affiliated hospital

1899
Reorganization as a national institute under the control of the Ministry of Internal Affairs

1897
Discovery of *Shigella* by Dr. Kiyoshi Shiga

*Photo courtesy of The Kitasato Institute

1905
Relocation of the institute to Shirokane-dai, Minato-ku

1906
Completion of the new building

1914
Reorganization under the Ministry of Education

1915
Discovery of Rat-bite Fever Spirochete by Dr. Kenzo Futaki

1916
Incorporation into Tokyo Imperial University

1930
Determination of the Etiology of Tsutsugamushi Disease (Rickettsia) by Dr. Mataro Nagayo

1934
Completion of the First Building

1935
Elucidation of Mosquito-borne Japanese Encephalitis by Dr.Tokushiro Mitamura

Discovery of the Pathogen of Lymphogranuloma Urethritis (Chlamydia) by Dr. Yoneji Miyagawa

1947
Transfer of about half of IID personnel to the newly founded "National Institute of Health", under control of the Ministry of Public Health and Welfare

Name changed from Tokyo Imperial University to the University of Tokyo

1952
Discovery of Trichomycin by Dr. Seigo Hosoya

1953
Discovery of the Blood Group Glycolipids by Dr. Tamio Yamakawa

1954
Discovery of Interferon by Dr. Yasuichi Nagano

1955
Isolation of Multidrug-resistant *Shigella* by Dr. Osamu Kitamoto

1965
Establishment of the Laboratory Animal Research Center

1966
Establishment of the Amami Laboratory of Injurious Animals

Institute for Infectious Diseases in Meiji Period

Institute of Medical Science

1967
Reorganization of the Institute of Infectious Diseases into the Institute of Medical Science

Completion of the Second Building

1980
Completion of the Third Building

Establishment of the Laboratory of Molecular Genetics

1991
Establishment of the Human Genome Center

1992
100th Founding Anniversary of the Institute

1995
Completion of the Fourth Building

1998
Establishment of the Center for Experimental Medicine (now "Center for Experimental Medicine and Systems Biology")

2000
Reorganization of 23 departments into 3 big departments; Microbiology and Immunology, Cancer Biology and Basic Medical Sciences

Establishment of the Advanced Clinical Research Center

2001
Opening of the Medical Science Museum

2003
Completion of new research facilities, the General Research Building and Hospital Building

2004
Reorganization of the University of Tokyo as a national university corporation

2005
Establishment of the International Research Center for Infectious Diseases

2006
Establishment of the Research Center for Asian Infectious Diseases with collaborating sites in Beijing and Harbin

Establishment of the Medical Proteomics Laboratory

2008
Establishment of the Center for Stem Cell Biology and Regenerative Medicine

2009
Official recognition as a Joint Usage/Research Center

2011
Establishment of the International Research and Development Center for Mucosal Vaccines

2014
Establishment of the Center for Gene & Cell Therapy

2015
Establishment of the Health Intelligence Center

2017
125th Founding Anniversary and 50th Reorganization Anniversary of the Institute

2018
Official recognition as an International Joint Usage/Research Center

2020
Integration of the Health Intelligence Center into the Human Genome Center

2022
Reorganization of the International Research and Development Center for Mucosal Vaccines into International Vaccine Design Center

IMSUT Landmark Achievements

- Elucidation of Hereditary Hemolytic Anemia by Dr. Shiro Miwa
- Contribution to the Eradication of Filariasis by Dr. Manabu Sassa
- Elucidation of Synaptic Ultrastructure by Dr. Kiyoshi Hama
- Elucidation of the Function of GTP-binding Proteins by Dr. Yoshito Kajiro
- Discovery of the Src-family Oncogenes by Dr. Kumao Toyoshima
- Start of Bone Marrow and Umbilical Cord Blood Transplantation Medicine by Dr. Shigetaka Asano
- Start of HIV/AIDS Treatment in Japan by Dr. Kaoru Shimada
- Determination of the Structure and Function of N-linked Oligosaccharides by Dr. Akira Kobata
- Elucidation of the Genetic Information of HTLV Virus by Dr. Mitsuaki Yoshida
- Elucidation of Protease-dependent Virus Pathogenicity by Dr. Yoshiyuki Nagai
- Determination of the DNA Sequence of Human Chromosome 21 by Dr. Yoshiyuki Sakaki

List of Deans

1st Shibasaburo Kitasato (1892-1914)	Acting Dean Ryojiro Fukuhara (1914-1915)	2nd Tanemichi Aoyama (1915-1916)	3rd Haruo Hayashi (1916-1919)	4th Mataro Nagayo (1919-1934)	5th Yoneji Miyagawa (1934-1940)	6th Tokushiro Mitamura (1940-1944)	7th Takeo Tamiya (1944-1949)	8th Shuji Hasegawa (1949-1956)	9th Yoshiharu Takeda (1956-1956)
10th Yasuichi Nagano (1956-1958)	11th Masashiro Kudo (1958-1965)	12th Ayao Yamamoto (1965-1968)	13th Manabu Sassa (1968-1971)	Acting Dean Yukinori Tsunematsu (1971-1971)	14th Manabu Sassa (1972-1973)	15th Tadashi Yamamoto (1973-1977)	16th Hiroto Shimojo (1977-1979)	17th Toru Tsumita (1979-1983)	18th Takeshi Odaka (1983-1987)
19th Kumao Toyoshima (1987-1990)	20th Akira Kobata (1990-1992)	21st Kazushige Hirosawa (1992-1996)	22nd Mitsuaki Yoshida (1996-1998)	23rd Ken-ichi Arai (1998-2003)	24th Tadashi Yamamoto (2003-2007)	25th Motoharu Seiki (2007-2011)	26th Hiroshi Kiyono (2011-2015)	27th Yoshinori Murakami (2015-2019)	28th Yuji Yamanashi (2019-2023)
29th Makoto Nakanishi (2023-)									

List of Directors of the Hospital

1st Tomoe Takagi (1895-1896)	2nd Gozou Moriya (1899-1901)	3rd Gorosaku Shibayama (1901-1914)	4th Kenzo Futaki (1914-1920)	5th Yoneji Miyagawa (1920-1945)	Acting Director Takeo Tamiya (1945-1946)	6th Yoshio Mikamo (1946-1951)	7th Osamu Kitamoto (1951-1969)	8th Yukio Ishibashi (1969-1971)	9th Tsunamasa Inou (1971-1974)
10th Keimei Mashimo (1974-1977)	11th Sugishi Ootani (1977-1981)	12th Genshitiro Fujii (1981-1985)	13th Shiro Miwa (1985-1987)	14th Nobuo Akiyama (1987-1991)	15th Kaoru Shimada (1991-1994)	16th Shigetaka Asano (1994-2003)	17th Aikichi Iwamoto (2003-2006)	18th Naohide Yamashita (2006-2010)	19th Kohzoh Imai (2010-2014)
20th Keiya Ozawa (2014-2018)	21st Arinobu Tojo (2018-2021)	22nd Hiroshi Yotsuyanagi (2021-2023)	23rd Tomoki Todo (2023-)						

Department of Microbiology and Immunology

Chair : Kensuke Miyake

Division of Infectious Genetics
Professor — Kensuke Miyake, M.D., Ph.D.
Project Associate Professor — Ryutaro Fukui, Ph.D.

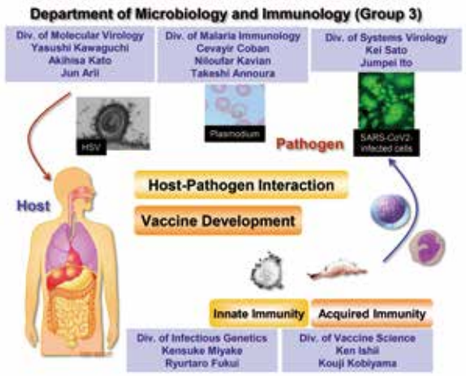
Division of Molecular Virology
Professor — Yasushi Kawaguchi, D.V.M., Ph.D.
Associate Professor — Akihisa Kato, Ph.D.
Visiting Associate Professor — Jun Arii, Ph.D.

Division of Vaccine Science
Professor — Ken Ishii, M.D., Ph.D.
Associate Professor — Kouji Kobiyama, Ph.D.

Division of Malaria Immunology
Professor — Cevayir Coban, M.D.
Associate Professor — Niloufar Kavian-Tessler, Ph.D.
Visiting Associate Professor — Takeshi Annoura, Ph.D.

Division of Systems Virology
Professor — Kei Sato, Ph.D.
Associate Professor — Jumpei Ito, Ph.D., D.V.M.

The growing concern in emerging and re-emerging infections increases demand for understanding these infections and controlling infectious diseases. Our department focuses on: the elucidation of molecular interactions between pathogens and hosts; molecular recognition of microbial products by the immune system; and molecular mechanisms controlling host defense systems. The department is composed of 5 divisions. We are closely working together to understand molecular mechanisms underlying host-pathogen interactions and develop novel vaccines or small chemicals to control infectious diseases and related immune disorders. Our research activities go beyond our institute and have been successfully running joint research projects in the area of infection and immunity with other research groups in Europe, USA, and Asia, as well as in Japan. The department is also promoting collaborative projects with the Research Hospital and Research Centers in our institute and pharmaceutical companies for the development of drugs and vaccines. Another important mission of our department is to promote development of young independent investigators in the fields of microbiology and immunology.



This figure shows 5 divisions in the Department of Microbiology and Immunology. Three divisions mainly focus on pathogens, whereas two divisions focus on host immune responses against pathogens. These divisions work together to understand the molecular bases underlying host-pathogen interaction and to develop novel vaccines or novel therapy for infectious diseases or related immune disorders.

Department of Cancer Biology

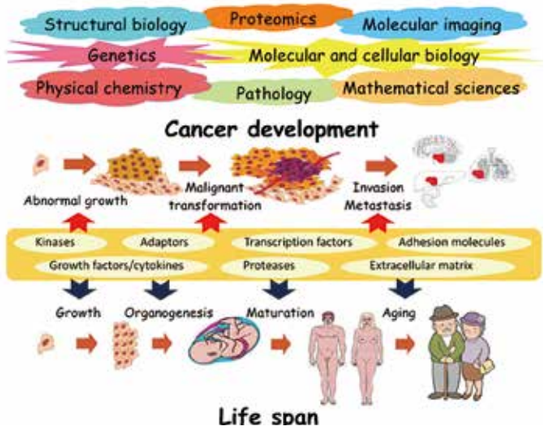
Chair : Yuji Yamanashi

Division of Genetics
Professor — Yuji Yamanashi, Ph.D.
Associate Professor — Akane Inoue-Yamauchi, Ph.D.

Division of Cancer Cell Biology
Professor — Makoto Nakanishi, M.D., Ph.D.
Associate Professor — Atsuya Nishiyama, Ph.D.

Division of Aging and Regeneration
Professor — Emi Nishimura, M.D., Ph.D.
Associate Professor — Takuma Shibata, Ph.D.

Development and progression of cancer is a multi-step process associated with structural and functional alteration of various genes, including those involved in regulation of cell growth, differentiation, aging, regeneration, and cell-cell and cell-matrix interaction. In the Department of Cancer Biology, we aim to clarify the entire picture of tumor development and progression and aging based on these gene products. To do so, we apply various multidisciplinary approaches in addition to molecular and cellular biological techniques and mouse genetics, such as proteomics, molecular imaging, structural biology, physical chemistry, and mathematical sciences. Our goal is to understand the molecular bases of cell growth, differentiation and aging, malignant transformation, tumor invasion, metastasis, angiogenesis, and drug resistance, with regard to pathogenic mechanisms in human cancer. The findings of our research will provide innovative targets for translational research. Ongoing research investigations are as follows. Division of Genetics: 1) Studies on molecular signals that regulate a variety of cellular activities, aiming to address how deregulated cellular signals cause neoplastic, neuromuscular or other intractable disorders. 2) Pathophysiological analyses of animal models for the above-mentioned diseases, aiming to develop new therapeutic approaches. Division of Cancer Cell Biology: 1) Elucidation of in vivo anticancer mechanisms and development of innovative cancer therapies. 2) Studies on regulatory mechanisms of in vivo aging. 3) Molecular basis underlying DNA methylation abnormalities in early stages of carcinogenesis. Division of Aging and Regeneration: Studies on the mechanisms of tissue regeneration, aging, and carcinogenesis with a focus on tissue stem cells, and development of technologies to control them.



Department of Basic Medical Sciences

Chair : Toshifumi Inada

Division of Cell Signaling and Molecular Medicine
Professor — Mutsuhiro Takekawa, M.D., Ph.D.
Visiting Professor — Naohiko Koshikawa, Ph.D.
Visiting Associate Professor — Hiroshi Yasui, M.D., D.M.Sc.
Senior Assistant Professor — Yuji Kubota, Ph.D.

Division of RNA and Gene Regulation
Professor — Toshifumi Inada, Ph.D.
Associate Professor — Yoshitaka Matsuo, Ph.D.

Division of Protein Metabolism
Professor — Yasushi Saeki, Ph.D.
Associate Professor — Taeko Kobayashi, Ph.D.

The Department of Basic Medical Sciences explores new fields in basic life science to understand life processes at deeper levels. Its goal is to develop fundamental bases for translational research across various diseases and research fields. The department consists of three groups: the Division of Cell Signaling and Molecular Medicine, the Division of RNA and Gene Regulation, and the Division of Protein Metabolism. Below is a summary of each division:

1. Division of Cell Signaling and Molecular Medicine: Aims to understand regulatory mechanisms of intracellular signal transduction systems critical for cell fate decisions and diseases. Also develops diagnostic and therapeutic tools for disorders involving these pathways.
2. Division of RNA and Gene Regulation: Seeks to understand the surveillance system preventing abnormal protein production in neurodegenerative diseases and aging. Focuses on ribosome collision and translation quality control, analyzing pathogenic mechanisms, and developing therapeutic and diagnostic agents.
3. Division of Protein Metabolism: Aims to understand biological phenomena regulated by intracellular proteolysis, particularly the ubiquitin-proteasome system. Investigates pathogenic mechanisms of diseases caused by abnormal proteolysis and contributes to ubiquitin drug discovery.

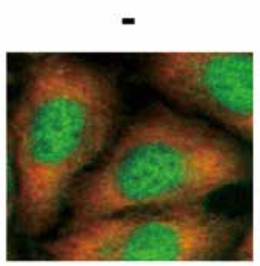


Fig.1 Arsenite induces the formation of cytoplasmic stress granules

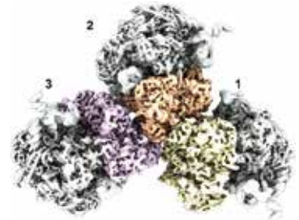


Fig.2 Structure of collided ribosomes revealed by cryo-electron microscopy

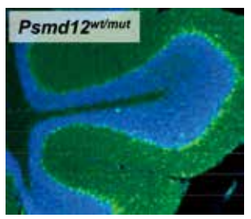


Fig.3 Ubiquitin staining of proteasome mutant mouse cerebellum

Human Genome Center

Director : Seiya Imoto

Laboratory of Genome Database
Professor — Kenta Nakai, Ph.D.

Laboratory of Molecular Medicine
Professor — Tatsuhiro Shibata, M.D., Ph.D.
Senior Assistant Professor — Atsushi Niida, Ph.D.

Laboratory of Genome Technology
Project Professor — Koichi Matsuda, M.D., Ph.D.

Laboratory of Sequence Analysis
Professor — Seiya Imoto, Ph.D.
Associate Professor — Kotoe Katayama, Ph.D.

Laboratory of Functional Analysis in Silico
Professor — Kenta Nakai, Ph.D.
Associate Professor — Sung-Joon Park, Ph.D.

Department of Public Policy
Professor — Kaori Muto, Ph.D.
Associate Professor — Izen Ri, Ph.D.

Division of Medical Data Informatics
Professor — Tetsuo Shibuya, Ph.D.

Division of Health Medical Intelligence
Professor — Seiya Imoto, Ph.D.
Associate Professor — Yaozhong Zhang, Ph.D.

Division of Metagenome Medicine
Project Professor — Satoshi Uematsu, M.D., Ph.D.
Project Associate Professor — Kosuke Fujimoto, M.D., Ph.D.

Division of Digital Genomics
Professor — Natsuhiko Kumasaka, Ph.D.

We promote personalized genomic medicine based on whole genome information and healthcare information and make a significant contribution to human society through the establishment of innovative diagnosis, prevention, and treatments for diseases. For this purpose, we are conducting the following projects by utilizing supercomputers and artificial intelligence technologies optimized for medical and life science research.

1) Biomedical research for new-dimensional genomic medicine
We will conduct a new dimension of genome research by adding metagenomic information on bacteria and viruses that coexist with us as a new dimension to human multi-omics information, including individual genomes, epigenomes, transcriptomes, proteomes, and metabolomes, obtained by using state-of-the-art measurement technologies such as ultra high-speed sequencing technology. By elucidating the connection between these differences and diseases such as cancer and lifestyle-related diseases, as well as environmental factors, we will lead to the development of innovative diagnostic, preventive, and therapeutic methods.

2) Medical informatics and AI for personalized genomic medicine
We develop medical informatics that organizes health-medical knowledge/information, analyzes and translates personal genomic information and their health-medical data for personalized genomic medicine. By taking advantage of the artificial intelligence and the supercomputer, we develop big data analysis technologies by integrating large-scale human genome-related databases, drug adverse reaction database, clinical information, etc., and establish cutting-edge computational software that accelerates personalized genomic medicine.

3) Public policy science for ethical, legal and social issues (ELSI)
We study various issues that arise at the point of contact with society in advancing life science and medical research. In order to promote personalized genomic medicine and advanced medical care, public understanding and social consensus building on the use of personal genomes are essential. Therefore, by empirical methods or comparative policy studies, we conduct various research such as prevention of the misuse and abuse of personal genetic information, disease notification, sharing decision-making process between medical care providers and patients, access right to their clinical/genomic information, and affordable health care service. We propose policy statements based on these studies.


Shirokane6&7(30,516 cores)


Lustre File System (30PB)


Archive Disk (~210PB)

Human Genome Center Supercomputer System
SHIROKANE

Center for Experimental Medicine and Systems Biology

Director : Tomoji Mashimo

Laboratory of Innate Immunity
Professor — Kensuke Miyake, M.D., Ph.D.

Laboratory of Reproductive Systems Biology
Project Professor — Masahito Ikawa, Ph.D.
Associate Professor — Manabu Ozawa, Ph.D.

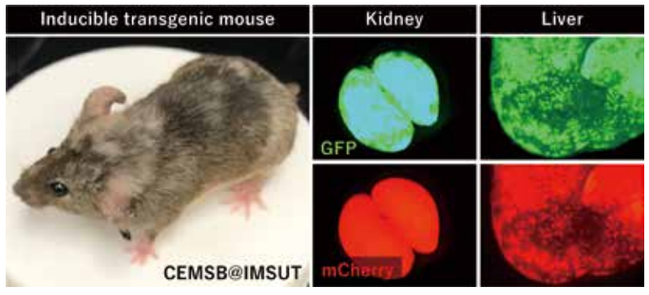
Laboratory of Genetically Engineered Mouse Research

Division of Genome Engineering
Professor — Tomoji Mashimo, Ph.D.
Associate Professor — Kazuto Yoshimi, Ph.D.

Division of Cell Regulation
Professor — Satoshi Yamazaki, Ph.D.
Associate Professor — Yosuke Tanaka, Ph.D.

Core Laboratory for Developing Advanced Animal Models
Professor — Satoshi Yamazaki, Ph.D.
Professor — Tomoji Mashimo, Ph.D.
Visiting Professor — Kimi Araki, Ph.D.
Associate Professor — Manabu Ozawa, Ph.D.

The Center for Experimental Medicine and Systems Biology, which consists of 6 laboratories, i.e., Division of Cell Regulation, Division of Genome Engineering, Laboratory of Innate Immunity, Laboratory of Reproductive Systems Biology, Laboratory of Genetically Engineered Mouse Research, and Core Laboratory of Developing Advanced Animal Models, was established in 2007. Although complete genome sequences of various organisms have been made available, the function of genes, the epigenetic mechanisms that control gene expressions, and the role of genomic elements, including non-coding elements, are not fully understood, especially at an organismal level. From this point of view, the purposes of the center are to establish in vivo experimental platforms for various research fields and develop animal models for investigating human diseases. Genetically engineered mice have offered the opportunity to analyze complex gene functions in vivo and provide various human disease models where new therapeutic approaches can be explored. Moreover, the application of CRISPR/Cas system enables efficient and rapid genome editing in rodents. We take advantage of embryo engineering technologies and genome editing technologies to devise in vivo experimental systems that link both basic sciences and medicine applications. Our center also has a mission to provide scientists at IMSUT and other academic institutes with genetically engineered animal models for studying various aspects of biology or human diseases. From this aspect, our center is also developing novel technologies for establishing advanced animal models for biomedical research. We hope our effort promotes interdisciplinary research that connects a wide range of research fields, including stem cell biology, immunology, and cancer biology, eventually leading to the establishment of novel therapies for human diseases.



A chimeric mouse with an inducible transgenic system

Advanced Clinical Research Center

Director : Fumitaka Nagamura

Division of Infectious Diseases
Professor — Hiroshi Yotsuyanagi, M.D., D.M.Sc.
Senior Assistant Professor — Michiko Koga, M.D., D.M.Sc.

Division of Clinical Genome Research
Professor — Yoichi Furukawa, M.D., Ph.D.
Associate Professor — Kiyoshi Yamaguchi, Ph.D.

Division of Innovative Cancer Therapy
Professor — Tomoki Todo, M.D., Ph.D.
Project Professor — Minoru Tanaka, M.D., Ph.D.

Division of Advanced Medicine Promotion
Professor — Fumitaka Nagamura, M.D., D.M.Sc.
Associate Professor — Masanori Nojima, M.D., Ph.D., M.P.H.
Visiting Associate Professor — Hiroaki Taniguchi, M.D., D.M.Sc.

Division of Advanced Genome Medicine
Associate Professor — Yoshihiro Hirata, M.D., Ph.D.
Senior Assistant Professor — Yasuo Matsubara, M.D., Ph.D.

Division of Bioethics

Division of Frontier Surgery
Professor — Dai Shida, M.D., Ph.D.
Associate Professor — Susumu Aikou, M.D., Ph.D.

Division of Hematopoietic Disease Control
Professor — Yasuhito Nannya, M.D., Ph.D.
Associate Professor — Takaaki Konuma, M.D., Ph.D.

Division of Advanced Gastroenterology and Endoscopy
Professor — Hiroaki Ikematsu, M.D., Ph.D.

Division of Anesthesia and Surgical Homeostasis
Professor — Masahiko Bougaki, M.D., Ph.D.

Division of Hematology and Tumor Biology
Associate Professor — Kon Ayana, M.D., Ph.D.

Advanced Clinical Research Center (ACRC) collaborates with basic research groups in IMSUT to translate the research outcomes into medical practice at IMSUT Hospital. The missions of ACRC are to perform clinical sciences targeting malignancies (mainly hematological malignancies and gastrointestinal malignancies), infectious diseases (such as COVID-19) and immunological diseases. ACRC also aims to translate its own research outcomes into early-phase clinical trials and to undertake the feed-back experiments from its own clinical experiences. For this purpose, ACRC is developing novel therapeutics utilizing various resources. Each division of ACRC performs peculiar medical research based on the concept of bench to bed, and proposes the ideas elucidating clinical problems from bed to bench. Therefore, each division has a close contact with basic scientists inside and outside IMSUT.
Currently, ACRC consists of 10 divisions: namely, Division of Hematopoietic Disease Control in which hematological oncologists are working, Division of Infectious Diseases in which professionals for HIV/AIDS, viral hepatitis and other infectious disorders are working, Division of Clinical Genome Research in which colorectal-oncologists are working, Division of Frontier Surgery, which creates solid evidence of surgical treatment for gastrointestinal cancers, Division of Innovative Cancer Therapy in which professionals for brain tumor surgery are developing oncolytic virotherapy, Division of Advanced Medicine Promotion which contributes to regulatory sciences in medicine, Division of Advanced Genome Medicine which uses biological models to develop novel therapies for gastrointestinal diseases, Division of Advanced Gastroenterology and Endoscopy, which develops endoscopy for gastrointestinal tumors, Division of Anesthesia and Surgical Homeostasis which provides advanced anesthesia care during surgery, and Division of Hematology and Tumor Biology which aims to elucidate the pathophysiology of cancer through omics analysis and other novel methods. Many of the staff members are physicians who support the clinical operations of the IMSUT Hospital while also engaging in new medical developments.

Position of ACRC in IMSUT

Center for Stem Cell Biology and Regenerative Medicine

Director : Hideki Taniguchi

Division of Regenerative Medicine
Professor — Hideki Taniguchi, M.D., Ph.D.
Associate Professor — Naoki Tanimizu, Ph.D.

Division of Stem Cell and Molecular Medicine
Professor — Atsushi Iwama, M.D., Ph.D.
Senior Assistant Professor — Motohiko Oshima, Ph.D.

Division of Stem Cell Transplantation
Professor — Yasuhito Nannya, M.D., Ph.D.
Project Professor — Satoshi Takahashi, M.D., D.M.Sc.

Division of Stem Cell Processing
Professor — Hideki Taniguchi, M.D., Ph.D.

Division of Mammalian Embryology
Project Associate Professor — Toshihiro Kobayashi, Ph.D.

Division of Stem Cell Aging Medicine
Professor — Emi Nishimura, M.D., Ph.D.

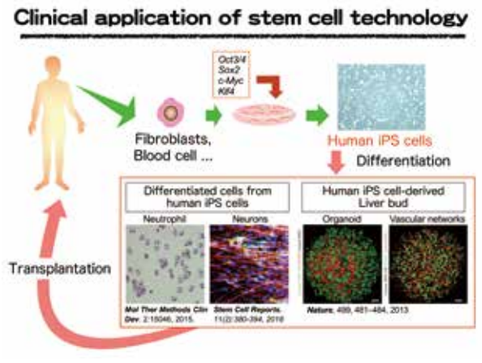
Division of Somatic Stem Cell Research
Associate Professor — Tokiko Nagamura-Inoue, M.D., D.M.Sc.

Division of Cell Engineering
Professor — Satoshi Yamazaki, Ph.D.

FACS Core Laboratory
Professor — Atsushi Iwama, M.D., Ph.D.

Stem Cell Bank
Professor — Hideki Taniguchi, M.D., Ph.D.

Stem cell research has been expected to provide alternatives to organ transplantation, and novel therapeutic approaches for cancer and other diseases. Center for Stem Cell and Regenerative Medicine was launched as a core research center for stem cell-based medicine. The center has 8 divisions, Division of Regenerative Medicine, Division of Stem Cell and Molecular Medicine, Division of Stem Cell Transplantation, Division of Stem Cell Processing, Division of Mammalian Embryology, Division of Stem Cell Aging Medicine,Division of Somatic Stem Cell Research and Division of Cell Engineering. The Center aims to translate research outcomes of stem cell biology into pre-clinical and clinical studies, and also to develop innovative therapeutic approaches to cancer stem cells and various diseases. It also serves to clarify various clinical problems using cutting-edge research tools such as patient-derived iPS cells. To support our research, we have FACS Core Laboratory and Stem Cell Bank and a service to generate patient-derived iPS cells.



International Research Center for Infectious Diseases

Director : Yasushi Kawaguchi

Department of Special Pathogens

Professor	Kei Sato, Ph.D.
Visiting Professor	Masaki Imai, D.V.M., Ph.D.
Visiting Professor	Seiya Yamayoshi, D.V.M., Ph.D.
Associate Professor	Takeshi Ichinohe, Ph.D.
Associate Professor	Jumpei Ito, Ph.D., D.V.M.

Department of Infectious Disease Control

Professor	Yasushi Kawaguchi, D.V.M., Ph.D.
Associate Professor	Akihisa Kato, Ph.D.
(Division of Viral Infection)	
Associate Professor	Takeshi Ichinohe, Ph.D.

Pathogenic Microbes Repository Unit

Professor	Yasushi Kawaguchi, D.V.M., Ph.D.

Outbreaks of emerging viruses such as influenza A(H1N1)pdm09 virus and SARS-CoV-2 have made us aware that the emergence of infectious diseases overseas can be a major threat to us living in Japan. To control such diseases, we need to develop methods for diagnosis, prevention, and treatment, including isolation and identification of the pathogen. For this purpose, basic research is essential to discovering the nature of the causative pathogen. Research institutions at universities must actively conduct basic research on such emerging infectious diseases and share their findings so that infectious control experts can respond promptly to emerging or re-emerging infectious diseases. Against this background, the International Research Center for Infectious Diseases was established in 2005 at the Institute of Medical Science, the University of Tokyo, and the Institute for Microbial Diseases, Osaka University. The joint research system serves as a base for advanced medical and biological research on emerging and re-emerging infectious diseases and for training infectious disease researchers. The center consists of two research departments and the "Pathogen Microbes Repository Unit"

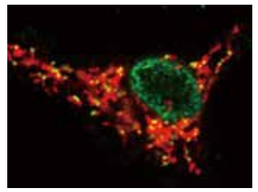


Fig. 1: Influenza virus-induced mitochondrial DNA (yellow) release

International Vaccine Design Center

Director : Ken Ishii

Human Immune-Profiling Team

(Division of Systems Immunology)

Professor	Kei Sato, Ph.D.

(Division of Human Immunology)

Professor	Ken Ishii, M.D., Ph.D.

(Division of Infection Immunology)

Professor	Cevayir Coban, M.D.
Visiting Professor	Anavaj Sakuntabhai, M.D., Ph.D.

New Dimentional Vaccine Design Team

(Division of Vaccine Engineering)

Project Professor	Kouhei Tsumoto, Ph.D.

(Division of Adjuvant Innovation)

Professor	Ken Ishii, M.D., Ph.D.
Visiting Professor	Jun Kunisawa, Ph.D.
Associate Professor	Kouji Kobiyama, Ph.D.

(Division of Mucosal Vaccines)

Project Professor	Kohtaro Fujihashi, D.D.S., Ph.D.
Visiting Professor	Koji Hase, Ph.D.
Visiting Professor	Tomonori Nochi, Ph.D.

(Division of Immunology and Genomics)

Professor	Ken Ishii, M.D., Ph.D.
Visiting Professor	Anavaj Sakuntabhai, M.D., Ph.D.

International Vaccine Design Center

Invited Professor	Tetsuro Matano, M.D., D.M.Sc.

The global COVID-19 pandemic has highlighted the need for continued investment in vaccine development research. Furthermore, the continued threat of emerging and re-emerging infectious diseases, including tuberculosis, AIDS, malaria, antimicrobial-resistant pathogens (AMR), Ebola haemorrhagic fever, and MERS, represents a significant global concern. Therefore, developing vaccines to prevent these emerging and re-emerging infectious diseases is an urgent issue not only for Japan but also for the entire world. At the International Vaccine Design Center (vDESC), experts in microbiology, immunology, protein engineering, genomic medicine, genetics, cell therapy, and clinical research—fields in which the Institute of Medical Science excels—are collaborating to modularize the critical components of vaccines, including antigens, adjuvants, and delivery systems. This collaborative effort is aimed at achieving the 100-day mission. Currently, through joint projects involving industry, government, and academia, we are advancing the clinical development and trials of many innovative next-generation vaccines. These include new modalities, adjuvants, novel measurement technologies, new vaccine designs utilizing artificial intelligence and big data, mucosal vaccines administered orally or nasally, and vaccines for treating cancer and lifestyle-related diseases. Importantly, the center is becoming a hub for fostering the next generation of researchers.

Center for Gene & Cell Therapy

Director : Takashi Okada

Division of Molecular and Medical Genetics

Professor	Takashi Okada, M.D., Ph.D.
Project Associate Professor	Yasushi Soda, M.D., Ph.D.
Project Senior Assistant Professor	Yasunari Matsuzaka, Ph.D.
Project Senior Assistant Professor	Yuko Kasahara, Ph.D.

Center for Gene & Cell Therapy

Professor	Tomoki Todo, M.D., Ph.D.
Professor	Fumitaka Nagamura, M.D., D.M.Sc.
Invited Professor	Koji Tamada, M.D., Ph.D.
Project Professor	Satoshi Takahashi, M.D., D.M.Sc.
Associate Professor	Tokiko Nagamura-Inoue, M.D., Ph.D.

IMSUT has been a leader in gene therapy and hematopoietic stem cell transplantation in Japan. To further promote clinical development, the Center for Gene & Cell Therapy (CGCT) was established in 2014 and is working on development of gene and cell therapies for intractable cancers and chronic diseases. We are focusing on oncolytic virotherapy, gene therapy for neurodegenerative diseases and vaccine development for emerging infectious diseases using adeno-associated virus vectors, engineered T cell therapy and hematopoietic stem cell gene therapy using lentiviral vectors, T lymphocyte therapy for post-transplant viral infections, and mesenchymal stromal cell therapy.

Laboratory Animal Research Center

Director : Tomoji Mashimo

Division of Animal Genetics

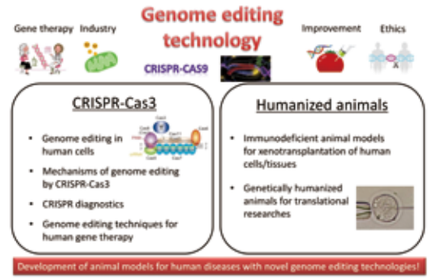
Professor	Tomoji Mashimo, Ph.D.
Associate Professor	Kazuto Yoshimi, Ph.D.

Animal Center

Professor	Tomoji Mashimo, Ph.D.

The Laboratory Animal Research Center (LARC) was founded in 1965 as the first modern animal facility in Japan. Mice and rats are strictly maintained in the SPF condition for many scientific experiments. We also provide several service for mouse embryo manipulation and generating genetically modified animals with genome editing technologies. In addition to such supports, we are developing useful genome editing too ls such as CRISPR-Cas3 and knock-in strategies in mice and rats. We are now focusing on generating "humanized animals" or "immunodeficient animals". These valuable animals can be used for xenotransplantation of human cells/tissues including human iPS cells.

The building of the Laboratory Animal Research Center



Amami Laboratory of Injurious Animals

Director : Tomoji Mashimo

Professor	Tomoji Mashimo, Ph.D.
Visiting Associate Professor	Takeshi Annoura, Ph.D.

This laboratory is the southernmost facility of the University of Tokyo, and has long history nearly 120 years in Amami Oshima. We have made great achievements in filariasis eradication from this island and also prevention of Habu bites. From 2005, the experimental environment that can handle BSL-2 and BSL-3 pathogens has been established as a primate experimental base of the International Research Center for Infectious Diseases, and became international joint usage and research center capable of infection experiment in non-human primates. Currently, we keep colonies of New World Monkeys adapted to the climate of Amami Oshima, and are conducting research in collaboration with various institutions in Japan and overseas.

Fig.1. (a) Main gate of facility,
(b) Animal experiment room for monkeys (ABSL3)

Medical Proteomics Laboratory

Director : Mutsuhiro Takekawa

Professor	Mutsuhiro Takekawa, M.D., Ph.D.	Project Professor	Kouhei Tsumoto, Ph.D.
Project Professor	Koichi Tanaka	Associate Professor	Masaaki Oyama, Ph.D.

Proteins play important roles in regulating complex biological events and their functional disorders often lead to a variety of diseases such as cancer and infection. The mission of our laboratory is to develop advanced technologies for antibody engineering, small-molecule screening, mass spectrometry and electron microscopy to perform an integrative proteomic analysis of disease-related protein-protein interaction networks not only from a physicochemical, structural biology point of view but also from a bioinformatical, systems biology point of view. We are also widely involved in many collaborative research projects to facilitate the utilization of these medical proteomics technologies inside and outside the institute.

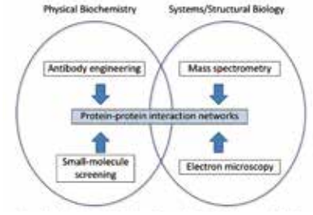


Fig 1. Protein interaction network analysis in medical proteomics research

Research Center for Asian Infectious Diseases

Director : Yasushi Kawaguchi

Professor	Yasushi Kawaguchi, D.V.M., Ph.D.	Visiting Professor	Seiya Yamayoshi, D.V.M., Ph.D.	Project Senior Assistant Professor	Mizuki Yamamoto, Ph.D.
Project Professor	Mitsue Hayashi, Ph.D.	Associate Professor	Akihisa Kato, Ph.D.		
Visiting Professor	Masaki Imai, D.V.M., Ph.D.	Project Associate Professor	Jin Gohda, Ph.D.		

Research Center for Asian Infectious Diseases is conducting collaborative research with three institutes, supported by the Japan Agency of Medical Research and Development (AMED). Collaborating institutes are: the Institute of Microbiology of Chinese Academy of Sciences (Beijing); the Harbin Veterinary Research Institute of Chinese Academy of Agricultural Sciences; the National Institute of Infectious Diseases (Tokyo). Center' s research focuses on basic and translational studies, targeting SARS-CoV-2, MERS-CoV, Dengue virus, HIV-1, avian and human influenza viruses, and drug-resistant bacteria. In Beijing, IMSUT scientists are working with Chinese scientists mainly on HIV-1 infection and latency.

Fig. Organization chart of Research Center for Asian Infectious Diseases. The center was established in 2005 under the auspices of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and has been supported by the Japan Agency for Medical Research and Development (AMED) since 2015 to the present.

Laboratory of Molecular Genetics

Director : Makoto Nakanishi

(Frontier Research Unit)
Associate Professor Kazuo Tatebayashi, Ph.D.

The faculty members of the Frontier Research Unit advance cutting-edge medical research based on their independent ideas.

IMSUT Distinguished Professor Unit

Division of Virology

IMSUT Distinguished Professor Yoshihiro Kawaoka, D.V.M., Ph.D.
Visiting Professor Takeshi Noda, D.V.M., Ph.D.
Visiting Professor Tokiko Watanabe, D.V.M., Ph.D.

Viruses can cause devastating diseases. The long-term goal of our research is to understand the molecular pathogenesis of viral diseases by using influenza virus, Ebola virus, and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections as models. Interactions between viral and host gene products during viral replication determine the consequences of infection (i.e., the characteristics of disease manifestation, whether limited or widespread); hence, our research has centered on such interactions during these viral infections.

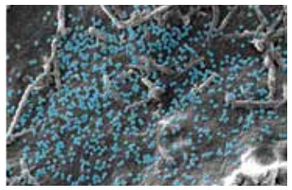


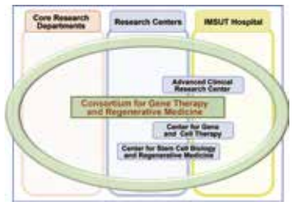
Fig. Scanning electron micrograph of virions (blue) being released from SARS-CoV-2 Omicron variant-infected cells

Consortium

Consortium for Gene Therapy and Regenerative Medicine

Professor	Atsushi Iwama, M.D., Ph.D.	Professor	Kaori Muto, Ph.D.	Professor	Tomoji Mashimo, Ph.D.
Professor	Tomoki Todo, M.D., Ph.D.	Professor	Takashi Okada, M.D., Ph.D.	Professor	Satoshi Yamazaki, Ph.D.
Professor	Fumitaka Nagamura, M.D., D.M.Sc.	Professor	Hideki Taniguchi, M.D., Ph.D.	Associate Professor	Tokiko Nagamura-Inoue, M.D., D.M.Sc.

Recent advances in gene therapy, regenerative medicine, and cell therapy have tightly linked these fields scientifically as well as in clinical practice. These fields have common target cells, organs, or diseases and utilize similar technologies. Based on these recent trends, we founded a consortium for Gene Therapy and Regenerative Medicine, in which IMSUT researchers working on gene therapy, regenerative medicine, cell therapy, Ethical, Legal and Social Issues (ELSI), and regulatory science liaise closely with each other and promote front-line research. Core members belong to the Center for Gene and Cell Therapy, Center for Stem Cell Biology and Regenerative Medicine, and Advanced Clinical Research Center, but we recruit all IMSUT researchers interested in these fields and aim to develop this consortium into an international hub for gene and cell therapy and regenerative medicine.



IMSUT Hospital

Director
Tomoki Todo, M.D., Ph.D.

Deputy Director
Yasuhito Nannya, M.D., Ph.D.

Department of Hematology/Oncology
Professor Yasuhito Nannya, M.D., Ph.D.
Project Professor Satoshi Takahashi, M.D., D.M.Sc.
Clinical Professor Tokiko Nagamura-Inoue, M.D., D.M.Sc.
Associate Professor Takaaki Konuma, M.D., Ph.D.
Associate Professor Kazuaki Yokoyama, M.D., D.M.Sc.
Project Associate Professor Koichiro Yuji, M.D., Ph.D.

Department of Infectious Diseases and Applied Immunology
Professor Hiroshi Yotsuyanagi, M.D., D.M.Sc.
Senior Assistant Professor Eisuke Adachi, M.D., D.M.Sc.
Senior Assistant Professor Michiko Koga, M.D., D.M.Sc.

Department of Rheumatology and Allergy
Associate Professor Motohisa Yamamoto, M.D., D.M.Sc.

Department of Oncology and General Medicine
Professor Narikazu Boku, M.D., D.M.Sc.
Professor Hiroshi Yotsuyanagi, M.D., D.M.Sc.
Senior Assistant Professor Yasuo Matsubara, M.D., Ph.D.
Project Senior Assistant Professor Koichi Kimura, M.D., D.M.Sc.

Department of Applied Genomics
Professor Yoichi Furukawa, M.D., Ph.D.

Department of Radiology
Associate Professor Hiroyuki Akai, M.D., Ph.D.
Senior Assistant Professor Toshihiro Furuta, M.D., Ph.D.

Department of Palliative Medicine and Advanced Clinical Oncology
Professor Tomoki Todo, M.D., Ph.D.
Visiting Professor Mieko Chinzei, M.D., D.M.Sc.

Department of Diagnostic Pathology
Associate Professor Yasunori Ota, M.D., Ph.D.

Department of Gastroenterology
Professor Hiroaki Ikematsu, M.D., Ph.D.
Associate Professor Yoshihiro Hirata, M.D., Ph.D.
Senior Assistant Professor Yasuo Matsubara, M.D., Ph.D.

Department of Surgery
Professor Dai Shida, M.D., Ph.D.
Associate Professor Susumu Aikou, M.D., Ph.D.

Department of Anesthesia
Professor Masahiko Bougaki, M.D., Ph.D.

Department of Joint Surgery
Project Professor Minoru Tanaka, M.D., Ph.D.

Department of Surgical Neuro-Oncology
Professor Tomoki Todo, M.D., Ph.D.
Project Professor Minoru Tanaka, M.D., Ph.D.

Department of Urology
Project Associate Professor Sayuri Takahashi, M.D., Ph.D.
Professor Haruki Kume, M.D., Ph.D.

Department of Medical Informatics
Associate Professor Hiroyuki Akai, M.D., Ph.D.
Senior Assistant Professor Toshihiro Furuta, M.D., Ph.D.

Department of Radiological Technology
Associate Professor Hiroyuki Akai, M.D., Ph.D.

Department of Cell Processing and Transfusion
Clinical Professor Tokiko Nagamura-Inoue, M.D., D.M.Sc.
Associate Professor Kazuaki Yokoyama, M.D., D.M.Sc.

Surgical Center
Project Professor Minoru Tanaka, M.D., Ph.D.

Department of Medical Supply Center
Project Professor Minoru Tanaka, M.D., Ph.D.

Department of Laboratory Medicine
Clinical Professor Tokiko Nagamura-Inoue, M.D., D.M.Sc.
Project Senior Assistants Professor Koichi Kimura, M.D., D.M.Sc.

Department of Pathology
Associate Professor Yasunori Ota, M.D., Ph.D.

Department of Clinical Genomics
Professor Yoichi Furukawa, M.D., Ph.D.

Department of Clinical Nutrition
Senior Assistant Professor Yasuo Matsubara, M.D., Ph.D.

Radiation Control Office
Associate Professor Hiroyuki Akai, M.D., Ph.D.

Regional Medical Liaison Office
Clinical Professor Tokiko Nagamura-Inoue, M.D., D.M.Sc.

Center for Clinical Safety and Infection Control
Professor Yasuhito Nannya, M.D., Ph.D.
(Department of Medical Safety Management)
Associate Professor Susumu Aikou, M.D., Ph.D.
Associate Professor Motohisa Yamamoto, M.D., D.M.Sc.
(Department of Infection Prevention and Control)
Senior Assistant Professor Eisuke Adachi, M.D., D.M.Sc.
Professor Hiroshi Yotsuyanagi, M.D., D.M.Sc.

Center for Translational Research
Professor Fumitaka Nagamura, M.D., D.M.Sc.
Associate Professor Masanori Nojima, M.D., Ph.D.

Therapeutic Vector Development Center
Professor Tomoki Todo, M.D., Ph.D.
Project Professor Minoru Tanaka, M.D., Ph.D.

IMSUT CORD
Clinical Professor Tokiko Nagamura-Inoue, M.D., D.M.Sc.
Professor Fumitaka Nagamura, M.D., D.M.Sc.

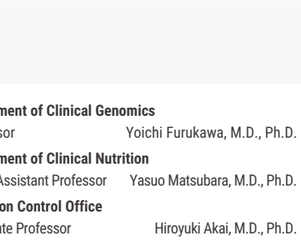
Department of Nursing
Director Mika Kogayu, RN. MSN.

Department of Pharmacy
Director Seiichiro Kuroda

Department of AIDS Vaccine Development
Invited Professor Tetsuro Matano, M.D., D.M.Sc.
Visiting Associate Professor Ai Tachikawa, D.M.Sc.

Since 2004, the hospital affiliated with IMSUT (IMSUT Hospital) has been the only one research hospital affiliated with a national university in Japan. The 8-storied hospital building has 122 beds including a ward organized for translational research and early clinical trials including first-in-human studies, an outpatient clinic, and operating rooms. Currently, IMSUT Hospital mainly targets diseases such as brain tumors, hematological malignancies, gastrointestinal tumors, urological tumors, solid tumors, infectious diseases, and autoimmune disorders. IMSUT Hospital, together with Advanced Clinical Research Center, is conducting research on disease pathophysiology and promoting translational research (TR), such as oncolytic virus therapy, gene therapy and cell therapy, as well as novel vaccine treatment. The organization of IMSUT Hospital consists of 4 units; (1) medical care unit, (2) care support unit, (3) clinical safety and infection control unit, and (4) clinical research support unit, and clinical activities of these units are supported by departments of nursing and pharmacy, and administration office.

IMSUT Hospital aims to be a core facility for clinical application of excellent outcomes by domestic and international collaborative research, especially in tight association with 3 major research departments and 6 research centers in IMSUT. Since activities and mission of IMSUT Hospital cannot be covered by its fixed operational expenses, IMSUT Hospital has been supported by a series of external funding such as grants from Japan Agency for Medical Research and Development (AMED), those from public sectors such as MEXT & MHLW as well as pharmaceutical companies. In recent years, IMSUT Hospital is still expanding its organization. In 2011 Department of Surgical Neuro-Oncology was established that promotes oncolytic virus therapy. Center for Antibody and Vaccine Therapy and Department of Palliative Medicine opened in 2012, and Center for Gene & Cell Therapy was founded in 2014. More recently, Department of Urology opened in 2020 for clinical practice of robotic surgery. In 2021, Department of Gastroenterology opened in collaboration with the Department of Surgery, and the Department of General Medicine was reorganized into the Department of Oncology and General Medicine, resulting in the present 14 clinical departments. In the past year, Departments of Gastroenterology and Anesthesiology both welcomed new professors, enforcing the advanced medicine capabilities of the IMSUT Hospital.



Corporate Sponsored Research Program/Social Cooperation Research Programs

Project Division of RNA Medical Science
Project Associate Professor — Kaku Goto, Ph.D.

Project Division of International Advanced Medical Research
Project Associate Professor — Koichiro Yuji, M.D., Ph.D.

Project Division of Advanced Biopharmaceutical Science
Project Associate Professor — Susana de Vega, Ph.D.

Project Division of Genomic Medicine and Disease Prevention
Project Professor — Toru Suzuki, M.D., Ph.D.

Project Division of Clinical Precision Research Platform
Project Professor — Satoshi Takahashi, M.D., D.M.Sc.

Project Division of Innovative Diagnostics Technology Platform

Project Division of Oncolytic Virus Development
Project Professor — Minoru Tanaka, M.D., Ph.D.

Project Division of Generative AI Utilization Aging Cells
Project Associate Professor — Teh-Wei Wang, Ph.D.

In addition to the three core departments and affiliated centers, IMSUT has set up corporate sponsored research program(s), of which the costs are paid by donations from supporting companies to extend educational and research activities. Social cooperation research programs have also been set up, aimed at collaborative research initiatives with private organizations through their funding of shared interest that can contribute to social benefit. The corporate sponsored research program(s) and social cooperation research programs are led by IMSUT project professors and contribute to evolving the educational and research activities of IMSUT, and to the expansion of the institute's diverse research.

Common Research Facilities

Culture Media Section
Head — Mutsuhiro Takekawa

Library
Head — Mutsuhiro Takekawa

Radioisotope Center
Head — Kensuke Miyake

IT Service Room
Head — Mutsuhiro Takekawa

Genetically Modified Microorganism Support Office
Head — Yasushi Kawaguchi

Office of Research Ethics
Head — Kaori Muto

Office of Health and Safety
Head — Tomoji Mashimo

Office of Intellectual Property
Head — Mutsuhiro Takekawa

Advisory Room for Conflict of Interest
Head — Seiya Imoto

Pathology Core Laboratory
Laboratory I — Head — Yasunori Ota
Laboratory II — Head — Yasunori Ota

Imaging Core Laboratory
Head — Mutsuhiro Takekawa

IMSUT Clinical Flow Cytometry Laboratory
Head — Tokiko Nagamura-Inoue

IMSUT-HLC Cell Processing Facility
Head — Tokiko Nagamura-Inoue

IMSUT Clinical Flow Cytometry Laboratory

Imaging Core Laboratory

Library

Technical Office

Head — Toshifumi Inada

Dean's Office

Dean's Advisor Office
Visiting Professor — Toichi Takenaka

Project Coordination Office
Head — Mutsuhiro Takekawa

Research Platforms Office
Head — Mutsuhiro Takekawa
Project Professor — Yataro Daigo
Project Associate Professor — Atsushi Takano

BioBank Japan
Head — Koichi Matsuda
Project Professor — Yoichiro Kamatani
Visiting Professor — Takayuki Morisaki

Education Activities

The Institute of Medical Science, The University of Tokyo (IMSUT), is prominent as an institution for graduate education. It provides an ideal environment for young people interested in pursuing a career in scientific research. Drawing upon a wide range of graduate schools such as medicine, science, agricultural and life sciences, pharmaceutical sciences, engineering, information science and technology, frontier sciences and interdisciplinary information studies, the faculties of the various divisions teach a wide range of courses to a similarly diverse array of elite graduate students. In order to pursue transdisciplinary approaches within the Graduate School of Frontier Sciences, the University of Tokyo has now established the new Department of Computational Biology and Medical Science. Through IMSUT's strenuous efforts, this department was established in fiscal year 2015, with the Shirokanedai campus housing many participating laboratories as well as some courses that make up the department's core curriculum. Thus, through strong links to IMSUT, cross-disciplinary education and research are expanding. The distinguishing features of our educational program are that it targets mainly graduate students aiming to become researchers, and that the professors and staff members can concentrate on guiding students in their laboratory research. The departments and divisions frequently collaborate and interact closely with each other, making interdisciplinary research yet one more of our distinguishing features.
The programs provided by the institute include a graduate seminar series and clinical courses for non-physician graduate students at IMSUT Hospital. The graduate seminar series consists of weekly seminars, provided by first-class researchers from around Japan, on a theme freshly chosen each year. Those courses are deemed to be credits for the graduate school of medicine. Our Institute's affiliated hospital provides clinical courses for non-physician graduate students, which include in-depth consideration of ethical issues and translational research.
IMSUT also has a rich educational environment for information science. At the Human Genome Center, there are faculty members with deep computing expertise, and workshops are frequently held there. Lectures offered by the Department of Computational Biology and Medical Science, Graduate School of Frontier Sciences, are open to IMSUT students outside this research area. Further, many other seminars are given by researchers from inside and outside Japan, providing a window onto the latest research progress.
Our library is available 24 hours a day including weekends and holidays.
IMSUT encourages students to conduct research enthusiastically, and works to motivate them. We honor exceptional graduate students every year with our Outstanding Student Publication Awards.

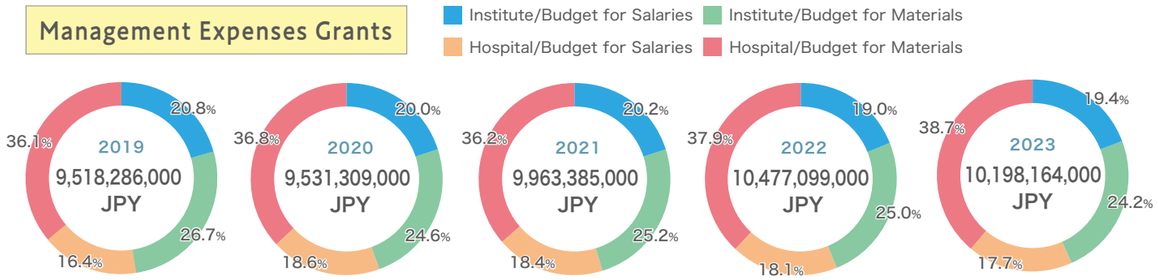
Medical Science Museum

The Medical Science Museum preserves and introduces to the public the valuable historical materials of the Institute of Medical Science (IMS), the University of Tokyo. Founded by Dr. Shibasaburo Kitasato in 1892 as the Institute of Infectious Diseases (IID), for more than half a century following its inception the institute served as a key player in infectious disease research in Japan. The IID at the time not only acted as the largest manufacturer of bacteriological products such as vaccines and antiserums, but also became involved in all aspects of research and medical care related to infectious disease: educating doctors and public sanitation officials on matters related to infectious disease, evaluating/approving bacteriological products, and so on. With the ongoing development of antibiotics and improvements in public sanitation, the importance of infectious disease research receded, and the IID was reborn as the Institute of Medical Science with its focus reset to cutting-edge research into medical science in 1967. And today, with the aim of clarifying the principles of infectious diseases, cancer and other specified diseases, and establishing practical treatments based on such insights, the institute carries out research and development in the most advanced areas of medicine such as genomic medicine and gene and cell therapies.
Surrounded by greenery, the museum beckons with its contrasting facets: a brick-style wing evoking a stable from the era of the IID and a glass-paneled wing heralding the future. Please contemplate the past and future of medical science during your visit.

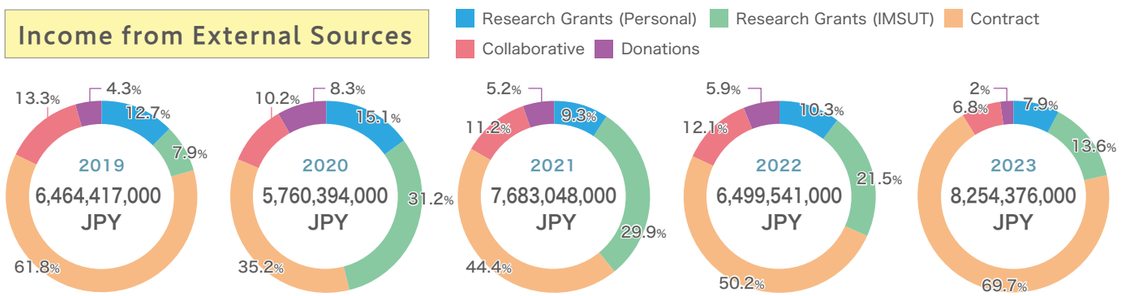
Dr. Shibasaburo Kitasato
Founding Dean of the Institute for Infectious Diseases
September, 1910 (Meiji period)
Preserved in the Medical Science Museum of the Institute of Medical Science, The University of Tokyo

Budget

Management Expenses Grants



Income from External Sources



Projects

(As of July 1, 2024)

Research and Education Projects by External Funds

Translational Research Program
Serving as a Center for Advancing Translational Research (CATR)

Project Head in IMSUT — IMSUT Hospital Director/ Professor Tomoki Todo

Japan Program for Infectious Diseases Research and Infrastructure
"Studies to Control Emerging, Re-emerging and Imported Infectious Diseases to Be Conducted in International Collaboration Sites in China"

Project Head — Professor Yasushi Kawaguchi

Biobank - Construction and Utilization Biobank for Genomic Medicine Realization (B-Cure)
"Management of Disease-oriented Biobank in Japan for Utilization"

Project Head — Project Professor Koichi Matsuda

Research and Education Projects by Management Expenses Grants

FY 2022-2027 — International Joint Research Project on Promotion of Basic and Applied Medical Sciences

FY 2022-2024 — International Joint Research Center for Promoting Basic and Applied Research and Implementing Translational Research

FY 2022-2027 — Cutting-edge Research and Next-generation Human Resource Development for the Control of Infectious Diseases Using Collaborative Infrastructure

Members

(As of July 1, 2024)

Staff

	Institute	Hospital	Total
Professor	30	1	31
Associate Professor	26	5	31
Senior Assistant Professor	4	3	7
Assistant Professor	34	12	46
Research Associate	1	0	1
Official	46	11	57
Technical Official	26	113	139

Institute 167 + Hospital 145 = 312

Fixed-term Project Staff

	Institute	Hospital	Total
Project Professor	7	0	7
Project Associate Professor	9	1	10
Project Senior Assistant Professor	3	0	3
Project Assistant Professor	13	3	16
Project Reseacher	45	1	46
Project Academic Specialist	41	13	54
Project Specialist	11	5	16
Project Medical Staff	0	27	27
Project Nursing Staff	0	14	14

Institute 129 + Hospital 64 = 193

Fixed-term Part-time (Project) Staff

	Institute	Hospital	Total
Project Professor	6	0	6
Project Associate Professor	1	0	1
Project Senior Assistant Professor	0	1	1
Project Assistant Professor	1	0	1
Project Reseacher	19	0	19
Project Academic Specialist	49	6	55
Project Specialist	17	2	19
Assistant Clerk	21	8	29
Technical Assistant	25	2	27
Part-time Academic Affairs Staff	1	0	1
Skilled Assistant	1	7	8
Member of the Medical Staff	0	15	15
Special Medical Intern	0	2	2
Assistant Medical Technician	0	4	4
Assistant Nurse	0	3	3

Institute 141 + Hospital 50 = 191

Total Number of Staff

Institute 437 + Hospital 259 = 696

Graduate School Students

Graduate School	Master's	Doctoral	Total
Graduate School of Medicine	0	33	33
Graduate School of Science	11	9	20
Graduate School of Agricultural and Life Sciences	0	0	0
Graduate School of Pharmaceutical Sciences	1	0	1
Graduate School of Information Science and Technology	7	13	20
Graduate School of Frontier Sciences	55	67	122
Graduate School of Interdisciplinary Information Studies	2	2	4
Graduate School of Engineering	13	18	31

Master's 89 + Doctoral 142 = 231

JSPS Research Fellow

	Total
JSPS Research Fellow (SPD)	1
JSPS Research Fellow (PD)	5
JSPS Research Fellow (RPD)	1
JSPS Research Fellow (DC)	16
JSPS Foreign Research Fellow	1

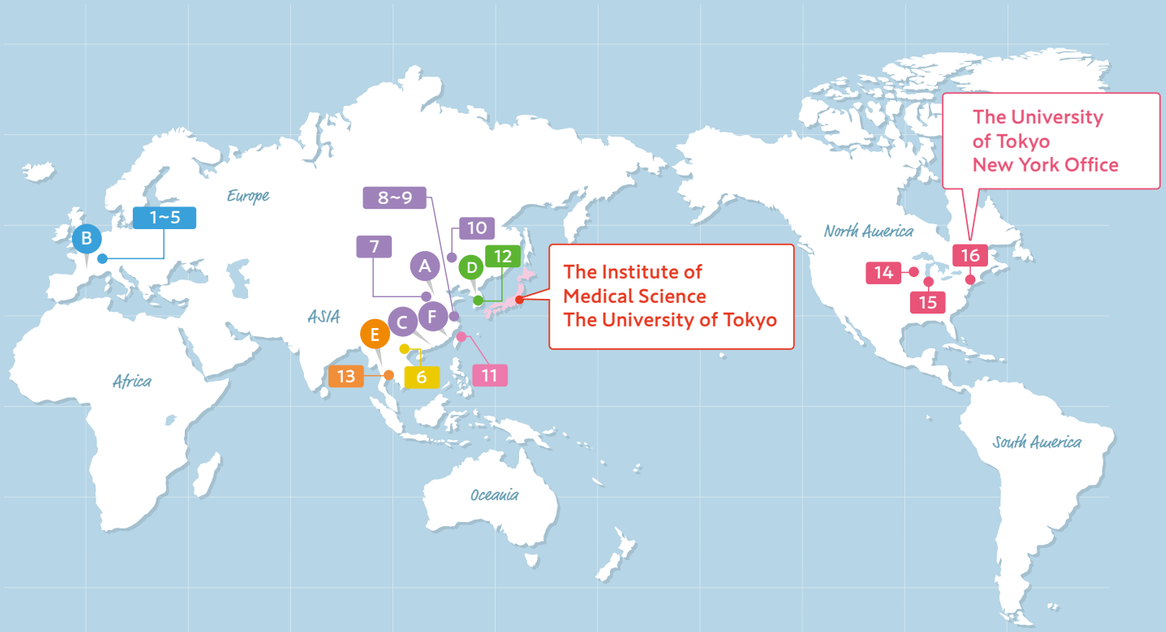
24

Research Students

	Total
Graduate Research Student	13
Graduate International Research Student	2
IMSUT Research Student	5

20

International Academic Exchange



International Academic Exchange Agreements

	Partner Universities / Institutes	Types of Agreements	Date of First Signing
A	Chinese Academy of Sciences	University Wide	2005.4.29
B	Institut Pasteur, France	Departmental	2006.4.18
C	Sun Yat-sen University, China	University Wide	2011.11.15
D	Soonchunhyang University, Korea	Departmental	2013.9.26
E	Khon Kaen University, School of Medicine, Thailand	Departmental	2016.12.20
F	Fujian Institute of Hematology, Fujian Medical University, China	Departmental	2020.6.3

International Academic Exchange

	Universities / Institutes		Universities / Institutes
1	University Claude Bernard	9	ShanghaiTech University
2	Institut National des Sciences Appliquées de Lyon	10	Harbin Veterinary Research Institute, Chinese Academy of Agricultural Sciences
3	École Normale Supérieure de Lyon	11	National Taiwan University
4	Université de Lyon	12	Seoul National University
5	Collège de France	13	Mahidol University
6	Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology	14	University of Wisconsin-Madison
7	Institute of Microbiology, Chinese Academy of Sciences	15	The University of Chicago
8	Center for Excellence in Molecular Cell Science, Chinese Academy of Sciences	16	New York Stem Cell Foundation

International Joint Usage / Research Center

International Joint Usage/Research Center

The Joint Usage/Research Center (JURC) was established by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) to enable researchers across Japan both to share access to large-scale research facilities, materials, and data beyond the boundaries of individual universities and to conduct joint research.
IMSUT was accredited by MEXT as a Joint Usage/Research Center in 2010, and in 2018 it was recognized as the only International Joint Usage/Research Center among university-affiliated research institutes in the field of life sciences in Japan. In line with MEXT's policy, IMSUT aims to advance basic and applied medical science and to realize advanced medical treatments in pursuit of global welfare.
Based on the network that we have established with domestic and overseas research institutions, IMSUT serves as a hub to help researchers work together organically and to promote long-term stable international collaborative research.

Structure

International Joint Research Center for Promoting Basic and Applied Research and Implementing Translational Research

Clinical Projects
Advanced Medical Development and Translational Research
- IMSUT Hospital
- Center for Stem Cell Biology and Regenerative Medicine
- Center for Gene & Cell Therapy
- Advanced Clinical Research Center

Key Project 3
Research and Next-generation Human Resources Development for Infectious Diseases Control
- International Research Center for Infectious Diseases

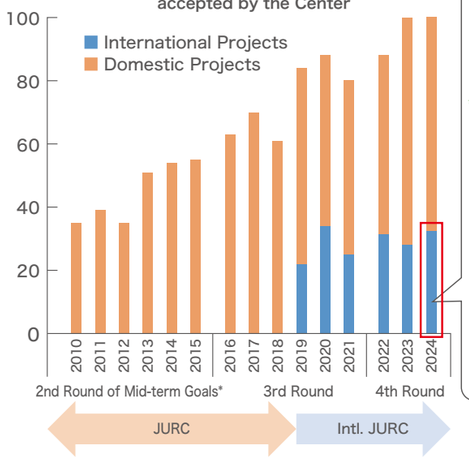
3 Core Research Areas
- Development of Cutting-edge Medical Therapies
- Genome/Cancer/Disease Systems Biology
- Infectious Diseases and Immunology

Key Project 1
Core Research for Creating New Dimension Genomic Medicine by Integrating Human Intelligence and AI
- Human Genome Center
- Center for Experimental Medicine and Systems Biology

Key Project 2
New Dimensional Vaccine Research and Development Program
- International Vaccine Design Center

Joint Research Projects

Change in the number of projects accepted by the Center



In FY2024, IMSUT IJURC supports 34 international joint research projects with 28 research institutions.

*Mid-term goals are set by MEXT.
Each national university formulates its own plans to achieve those goals within the next 6 years.

Caupus Map

IMSUT Hospital

- Hospital Reception for Outpatients
- A Hospital Bldg. A
- B Hospital Bldg. B
- C Hospital Bldg. C

University Facilities

1 Bldg. 1
2 Bldg. 2
3 Bldg. 3
4 Bldg. 4
5 Animal Center
6 Amgen Hall
7 General Research Bldg.
8 Clinical Research Bldg. A
9 Core Facility for Therapeutic Vectors
10 Research Bldg. Annex
11 Open Laboratory Bldg.
12 Human Genome Center Annex
13 Crest Hall
14 Human Genome Center
15 Medical Science Museum
16 Shirokane Hall
17 BioBank
18 Tennis Courts

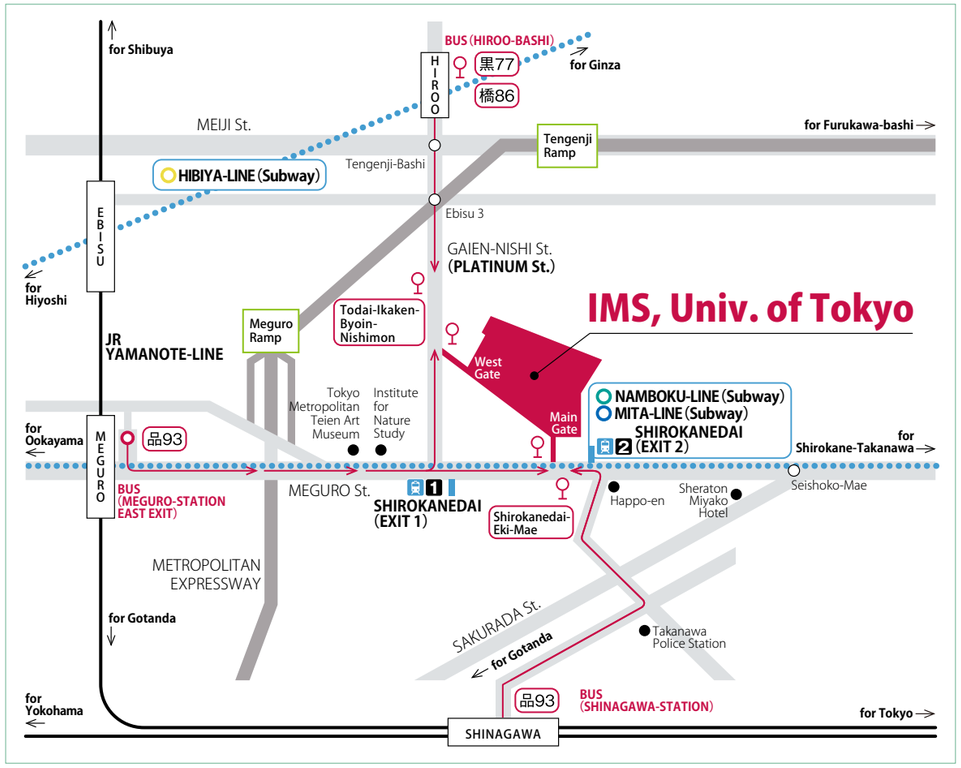
- Hospital Information
- Station
- Rest Area
- Bus Stop
- Restaurant
- Parking
- Shop
- Parking for Patients

(Unit:㎡)

Grounds/Buildings		Land Space	Buildings: Floor Space	Buildings: Total Space
Shirokanedai	Institute		11,548	54,126
	Hospital		3,305	23,259
	Subtotal	68,907	14,853	77,385
Amami		8,834	822	807
Total		77,741	15,675	78,192

Locations: IMSUT — 4-6-1 Shirokanedai, Minato-ku, Tokyo
Amami Laboratory of Injurious Animals — 802 Tean-sude, Setouchi-cho, Oshima-gun, Kagoshima

Access Map



SHIROKANEDAI SHIROKANEDAI-STATION on the Metro NAMBOKU or MITA LINE (EXIT 2)

By WALK FROM STATION

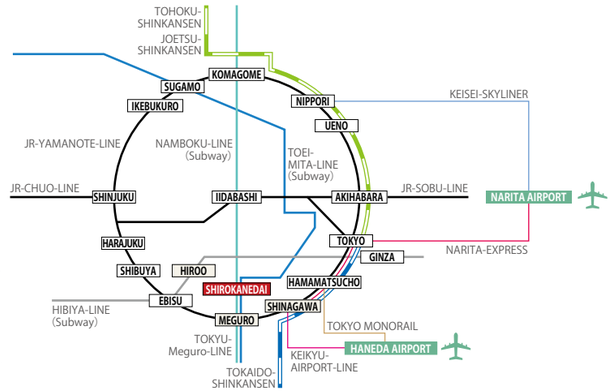
MEGURO 15 min. walk from JR-MEGURO-STATION EAST EXIT

By BUS FROM STATION

MEGURO From JR-MEGURO-STATION EAST EXIT (MEGRO-EKI-MAE bus stop)
＊take (品93) metropolitan bus bound for OHI-KEIBAJO
>> get off at SHIROKANEDAI-EKI-MAE
＊take (黒77) metropolitan bus bound for SENDAGAYA-EKI-MAE
(or take (橋86) metropolitan bus bound for SHINBASHI-EKI-MAE or TOKYO TOWER)
>> get off at TODAI-IKAKENBYOIN-NISHIMON

SHINAGAWA From JR-SHINAGAWA-STATION (SHINAGAWA-EKI-MAE bus stop)
＊take (品93) metropolitan bus bound for MEGRO-EKI-MAE
>> get off at SHIROKANEDAI-EKI-MAE

HIROO From HIROO-STATION on the Metro HIBIYA LINE (HIROO-BASHI bus stop)
＊take (黒77) or (橋86) metropolitan bus bound for MEGRO-EKI-MAE
>> get off at TODAI-IKAKENBYOIN-NISHIMON



https://www.ims.u-tokyo.ac.jp/imsut/en/access/access/

https://www.ims.u-tokyo.ac.jp/imsut/en/

4-6-1, Shirokanedai, Minato-ku, Tokyo, 108-8639, Japan TEL / (+81)-3-3443-8111

UTokyo
The Institute of Medical Science
The University of Tokyo