



# Keio University

## Graduate School of Medicine

# 2018





# Blazing a Path for the Future of Medicine Bringing Together and Educating World-Class Minds

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## Message from the Dean

**Yutaka Kawakami, MD, PhD**  
Dean, Graduate School of Medicine



The value of a university lies in its ability to produce new ideas, and through scholarship create things that are of value to society. The top-level researchers in the Keio University Graduate School of Medicine pursue advanced research across a wide range of fields including the biological sciences, basic medical science, clinical medicine, and social medicine. Research conducted with an enthusiasm for science has not only scientific value, but it can lead to remarkable advances in drug discovery; and when conducted with clinical specimens it can provide the seeds for new scientific discoveries, breakthroughs in thinking, and improved methods for the diagnosis, treatment, and prevention of disease. Advancing the biological understanding of humans through clinical studies and other research is the fundamental characteristic of the Graduate School of Medicine. In parallel, the importance of social medicine is also on the rise, as public policy is increasingly informed by the analysis of big data from fields such as molecular epidemiology and public health.

Dr. Shibasaburo Kitasato, the first dean of Keio University School of Medicine, sought to achieve a greater coordination between basic and clinical sciences that would unite the school as one family. The close connection between basic science and clinical medicine is a major reason why Keio remains one of Japan's most prominent institutions of learning. The Graduate School of Medicine continuously promotes cooperative research between the life sciences, basic medical science, clinical medicine, and social medicine in order to educate students who can actively contribute to the world. Furthermore, it continues to invest in new research facilities and equipment while increasing the number of courses conducted in English, fostering an interdisciplinary education and research system, pursuing links with renowned domestic and overseas research institutions, and forging research ties between academia and industry. The number of students who publish their degree theses in respected international journals is increasing, and many students pursue international study abroad opportunities. We hope these students will go on to tackle some of the world's most challenging medical problems.

Keio is leading the vanguard of the future of medicine, and we hope more motivated individuals will consider joining us to take on this challenge together.

## HISTORY OF KEIO MEDICINE

In 1917, world-renowned microbiologist Dr. Shibasaburo Kitasato was appointed as the first dean of the School of Medicine. The young Kitasato had dedicated his career to making medicine more accessible to the public, founding his own institute of medicine with the help of Keio founder Yukichi Fukuzawa.

Established in 1956, the Graduate School of Medicine has continued to vigorously pursue its ideal of educating medical scientists and clinical researchers who will help define future international standards in an environment that unites basic science and clinical medicine.



**Yukichi Fukuzawa**  
Keio University Founder  
1835 - 1901



**Shibasaburo Kitasato**  
First Dean of the School of Medicine  
1853 - 1931

After Graduation : Assistant Professor, Division of Endocrinology,  
Metabolism and Nephrology, Department of Internal Medicine,  
Keio University School of Medicine

In my time in the Graduate School, I studied chronic inflammation in adipose tissue in the development of type 2 diabetes insulin resistance. Recently, it has become clear that various immune cells, beginning with macrophages, infiltrate adipose tissue in obese humans and mice. Among the molecular mechanisms which regulate immune cells, our research focused on functional analysis in insulin resistance of the transcription factor known as macrophage FOXO1 (Forkhead box O1). In this research, we observed that Ccr2 chemokine receptor expression is directly regulated by macrophage FOXO1, and this is responsible for regulating chronic inflammation in adipose tissue and whole-body insulin sensitivity. We expect that by clarifying the molecular mechanisms of the regulation of macrophage infiltration in adipose tissue, new treatments for type 2 diabetes will be developed. After this, I hope we can identify the factors of macrophage FOXO1 activation caused by obesity and high adipose absorption, and clarify the control mechanisms. In the future, I hope we can clarify the mechanism how macrophage Foxo1 activation is regulated by obesity and high fat diet.

#### Message to Prospective Students

The most exciting aspect of graduate school was being able to not only study diabetes for my research in insulin resistance, but also to learn about a broad range of fields such as molecular biology, pathology, physiology, biochemistry, immunology, and microbiology. Keio University School of Medicine provides fertile ground to pursue your research interests with passion and limitless possibilities. I really hope you consider coming here to work hard at graduate school research in order to discover your own data that no one else in the world knows.



Message  
01

### Yoshinaga Kawano

(2012 Graduate)

#### PhD Degree Thesis:

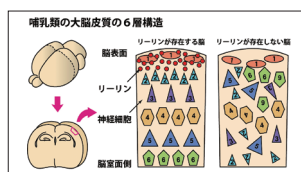
Kawano Y, Nakae J, Watanabe N, Fujisaka S, Iskandar K, Sekioka R, Hayashi Y, Tobe K, Kasuga M, Noda T, Yoshimura A, Onodera M, Itoh H. Loss of PDK1-Foxo1 Signaling in Myeloid Cells Predisposes to Adipose Tissue Inflammation and Insulin Resistance. Diabetes 61: 2012. 1935-48

# Special Messages

From Bench to Bedside  
Medical Researchers With a Bright Future

After Graduation : Novartis Pharma K.K.

In the cerebral cortex (neocortex) in the brain, which governs higher order brain functions such as perception, thought, and memory, neurons are arranged in an ordered, six-layered structure. In order for this structure to form properly, a protein known as Reelin is required, and when there is a lack of Reelin in the development process, cortex structure formation is disrupted. More than 20 years have passed since the discovery of Reelin, but many large questions remain such as what role Reelin plays with regards to neural cells and how it ultimately functions in the formation of the layered structure.



In my research group, we discovered that Reelin temporarily strengthens neuronal cell adhesion and that this is important for proper formation of the brain's layered structure.

Reelin is not only involved in brain structural formation, but it also seems to be relevant to mental and neurological disorders like schizophrenia, autism, and epilepsy, and we hope that our work proves beneficial for understanding and treating these diseases.

#### Message to Prospective Students

As a graduate student, I am able to immerse myself in research from morning to night and spend my time in a meaningful way. Through experiments, discussion, and reading and writing scientific papers, I was able to develop a scientific way of thinking that will definitely be a useful skill in any field I pursue in the future.

Doing world-class research with not only medical doctors, but other students and faculty from a variety of backgrounds for four years made me feel like I experienced tremendous growth not only as a researcher but as a person as well.



Message  
03

### Yuki Matsunaga

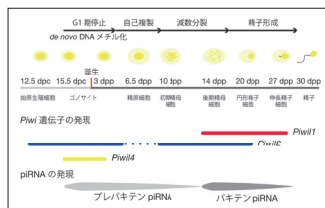
(2016 Graduate)

#### PhD Degree Thesis:

Reelin transiently promotes N-cadherin-dependent neuronal adhesion during mouse cortical development

After Graduation : PhD Program, Keio University Graduate School of Medicine

It is known that in animals that reproduce sexually, PIWI proteins are expressed specifically in gonads, which then form complexes with small RNAs termed piRNAs; and these are responsible for transposon silencing in a mechanism known as "RNA silencing." Defects in *Piwi* genes in mouse cause infertility due to incomplete sperm formation, indicating the essential role they play in living animals. This regulation mechanism and the contribution it makes to the formation of normal reproductive tissues is still unclear. To investigate this mechanism using a biochemical and bioinformatics approach, we produced high quality monoclonal antibodies which specifically recognizes mouse PIWI proteins. Using these, we then performed a biochemical analysis, as well as a comprehensive piRNA sequence analysis using a next generation sequencer, and are studying the mechanism in which PIWI and piRNA complexes maintain normal function of the reproduction system in mice.



Message to Prospective Students

As an undergraduate, I studied bioinformatics which combines the fields of biology and information science. When I decided to continue on to graduate school, I wanted to learn more about not only analytical skills in information science, but also biochemical experimentation techniques, so I joined the Graduate School of Medicine. Through my classes I took and interactions with people from a variety of backgrounds, I was able to rediscover the importance and fun of clinical research. Also, being able to observe the actual clinical setting in one clinical experience course was an incredibly valuable experience. I am looking forward to continuing to the PhD program and obtaining my degree. I want to do my best to become able to bridge the gap between basic and clinical research.



Message  
02

Kyoko Ishino

(2016 Graduate)

Master's Degree Thesis:  
Analysis of PIWI-piRNA pathways in  
*Mus musculus* and *Mesocricetus auratus*

At Keio University Graduate School of Medicine, students are conducting internationally recognized exceptional research, and many students have received awards for their work. Students from all over the world are also joining the ranks at Keio and are contributing to successes in medical research.

Keio University is a globally respected Japanese university, founded in 1858 it is the oldest tertiary institution in Japan rich in culture and history. I have had the pleasure to study at the Keio University's Graduate School of Medicine for my Master's Program in Medical Sciences which has been extremely fruitful. Not only have I enriched my understanding regarding my specialized academic field, I have fostered a sense of personal empowerment. The campus is located in Tokyo; it is an interactive gathering point for ambitious, like-minded people from all over the world creating a stimulating and energetic environment. Moreover, Keio University has a vast network of international affiliations with other leading institutions. On a frequent basis, seminars are presented by researchers from all over the globe. Supported by the Keio Medical Science Fund, I had the opportunity to study at the prestigious Karolinska Institute in Sweden which was an unforgettable experience. Choosing to study at Keio University has been a truly memorable and defining point in my life. It has opened doors to many exciting new opportunities and I highly recommend Keio University to those contemplating to study here.



Message  
04

Chau Simon

(2016 Graduate)  
Immunization of Tamoxifen Inducible  
AQP4 Mice to Replicate Symptoms of  
Neuromyelitis Optica



# Graduate School of Medicine

## Admission Capacity

Master's Program (2-year) : 20 Students

<http://www.med.keio.ac.jp/en/admissions/wasters/>

PhD Program (4-year) : 80 Students

<http://www.med.keio.ac.jp/en/admissions/doctoral/>



## Admission Policy

The Graduate School welcomes the following students who possess abundant knowledge and research ability without regard to nationality:

Highly motivated students who desire to become world-class researchers in medicine and medical science

- Students who can comfortably read, comprehend, and critique English journal articles in the life sciences and medical fields

- Students who possess abundant basic knowledge of the medical and life sciences

## Curriculum Policy

### ● Master's Program

The Master's Program is open to applicants with a background outside of medicine, and aims to train high-quality specialists and researchers in a variety of fields related to medicine. During the first year, students take lectures in basic medicine and conduct research in preparation for their master's thesis. The curriculum is designed to imbue the student with the ability to acquire a deep understanding of the fields of medical science and medical care most relevant to their chosen occupation goals; both in their current state and future outlook.

### ● PhD Program (Medical Science Specialty)

The curriculum is designed in accordance with the principles of practical learning. Accordingly, all required courses are taught in English in order to equip students for careers in the international arena. Students can attend seminars that are hosted regularly by the Keio Medical Society, which consist of lectures, presentations, and discussions held in English with leading researchers from Japan and abroad. PhD students develop internationally-minded, practical research skills. Students can also conduct research for their degree at leading partner institutes in Japan.

### ● PhD Program (Applied Medicine Specialty)

This specialty comprises two unique sub-specialties in clinical oncology and clinical research. In each, students participate in lectures, write reports, and gain practical research experience in a wide range of domains.

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## Diploma Policy

### ● Master's Program

In the Master's Program, the student must submit a master's degree thesis and undergo a review. In the fall of the second year, a presentation assembly is held in order for students to present their research progress and receive advice and instruction from experts other than their supervisor.

### ● PhD Program

In the PhD Program, a progress audit is held in the third year; and after submitting a doctoral thesis (in English) of which the candidate is the first author (published article or a collection comprising multiple theses), a final assessment is held that is open to all Keio-affiliated personnel. Students who demonstrate exceptional research achievements can apply for their degree during their third year.

## Curriculum and Eligibility

### ● Master's Program (2-year) [Admission Capacity: 20 Students] Training Researchers and Specialists for Success in a Variety of Fields Related to Medicine

The Graduate School of Medicine Master's Program strongly emphasizes:

- 1) -Acquiring the basic knowledge and abilities necessary for growth and success in the student's chosen medicine-related field as a specialist or researcher.
- 2) -Adequately equipping the student to have a nuanced understanding of the current state of his or her medicine-related field as well as its future outlook.
- 3) -Being intimately familiar with all aspects of illness including ramifications on patients, families, and medical caregivers.

The program is designed for students of the natural sciences or humanities/social sciences. It seeks to imbue students with deep knowledge of medicine gained through direct study and research in Keio's hospital and research labs in order to become successful professionals or to continue on to the PhD Program.

### ● PhD Program (4-year) [Admission Capacity: 80 Students] Training Creative, Independent Researchers in a Wide Range of Fields

This program is designed for graduates of a 6-year medical, dentistry, veterinary, or pharmacy school; as well as graduates of a master's degree program. The goal of the Medical Science Specialty is to train students to conduct creative research in the fields of basic medical science and clinical medicine, as well as research into the mechanisms of diseases and the development of new therapeutic approaches. The Applied Medicine Specialty is designed mainly for practicing physicians and other medical professionals. Its aim is to guide students in using their clinical knowledge and analytical skills to plan and conduct comprehensive clinical trials and interdisciplinary research especially in the fields of oncology and cardiology.

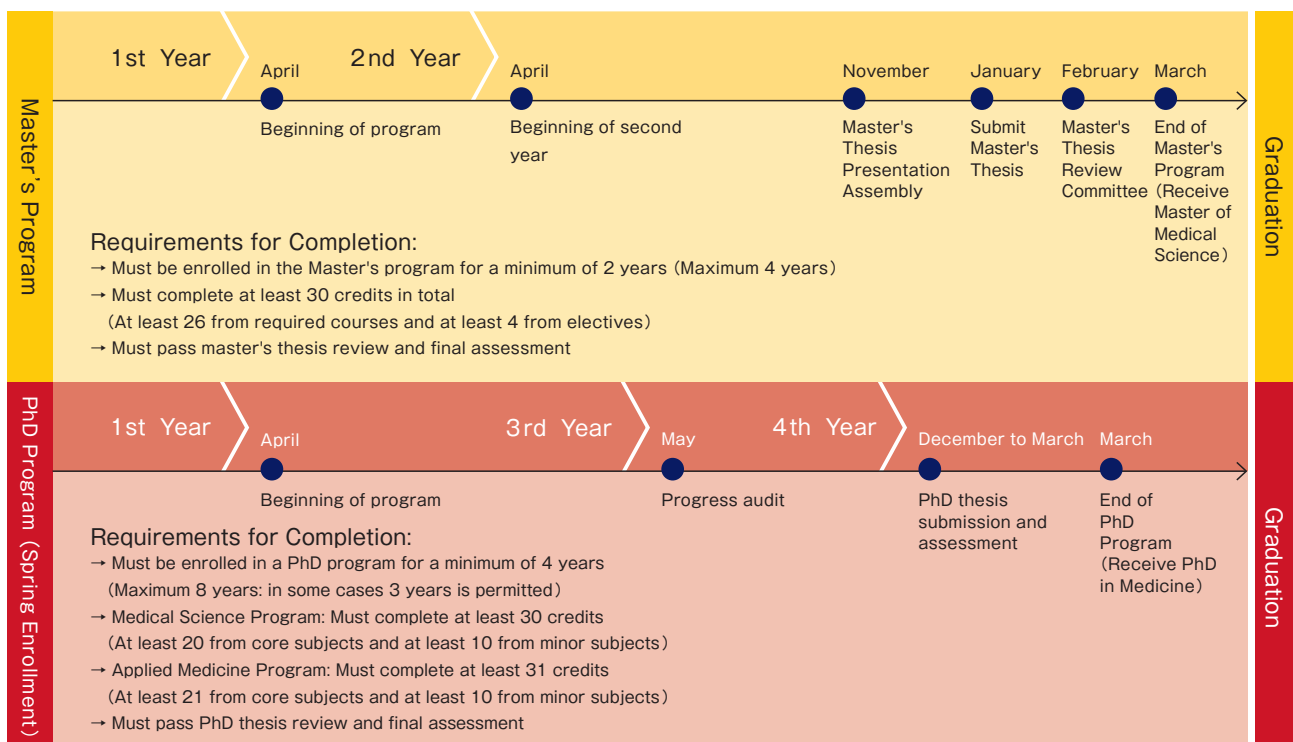
The program seeks to advance cooperative research with outside research institutions and organizations; and seeks to encourage high-quality, fruitful research through the uninhibited interaction between doctoral students and other researchers at Keio, as well as with researchers from industry. Students can also experience first hand the process of acquiring patents and creating intellectual property in this collaborative environment.

## Research Facilities

To conduct excellent and fruitful medical research, it is essential to have full access to a complete range of research equipment and facilities, in addition to ample ingenuity and motivation. In the Keio University Graduate School of Medicine, students and researchers can make full use of a range of collaborative research facilities such as the Shinanomachi Media Center (Kitasato Memorial Medical Library), RI Center, Laboratory Animal Center, and Collaborative Research Resources. A rich collection of books and over 11,000 medical e-journals (the largest collection in Japan) are available in the Kitasato Memorial Medical Library. A range of animals from small mice to those of larger sizes are bred and raised in the Laboratory Animal Center. Over 100 pieces of analysis equipment necessary for all manners of life sciences research including omics, imaging, and disease modeling are available in the Collaborative Research Resources. Equipment such as micro-array analysis devices, next-generation sequencers, cell sorters, laser confocal microscopes, super-resolution microscopes, micro-CTs for small animals, mass spectrometers, histological analysis devices and other advanced equipment are fully available to students in our Master's and PhD Programs.



## Degree Granting Process





# Cancer Professional Development Program

The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has organized the Human Resource Development Plan for Cancer from 2007 to 2011, and the Promotion Plan for the Platform of Human Resource Development for Cancer from 2012 to 2016. Under the support of these programs, Keio has offered various courses in order to develop high-quality cancer care specialists. From 2017, Keio will

offer the following programs in order to develop leaders in cancer care who can advance cutting-edge cancer team treatment anywhere in the world. On April 11, 2017, we applied for funding under the Japanese government's Cancer Professional training plan, which is designed to develop professionals who can address a wide range of needs in cancer care.

## Outline of the Cancer Professional Curriculum in the Graduate School of Medicine

### ● Master's Program

This Master's Program course focuses on those who have attained a professional qualification in physical therapy, occupational therapy, or speech-language-hearing therapy. In addition to required courses, students study rehabilitation medicine and cancer rehabilitation. Students are also trained as rehabilitation specialists focusing on prevention and treatment methods for various functional disorders that arise in cancer patients. Students acquire practical clinical and research abilities, thereby enabling them to participate in interdisciplinary cancer teams and lead the future of cancer rehabilitation.

### ● PhD Program (Applied Medicine Specialty)

[Clinical Oncology Track] Refining students clinical expertise and knowledge through training in planning optimal treatment strategies for cancer patients as a leader of an oncology team

Medical clinical oncology specialist course / Surgical oncology specialist course / Radiation oncology specialist course / Palliative care specialist course / Rehabilitation specialist course / Medical physicist course

While designing and conducting clinical research under the guidance of their supervising professor, students also take courses in a range of topics from cancer diagnosis to treatment, as well as in fundamental topics in cancer medicine. In addition, students rotate in multiple hospital departments (including chemotherapy, molecular targeted therapy, radiation oncology, minimally-invasive surgery, palliative care, and rehabilitation medicine) and experience actual treatment practices and procedures in order to acquire interdisciplinary treatment knowledge. After four years, students are prepared to become high-level specialists who are capable of leading cutting-edge advancements in cancer care.

### Cancer Professional (Master's) Program Outline (Ex.)

1st Year	Spring Semester	In addition to required courses, additional credits are taken in Cancer Professional (PhD) Program courses
	Autumn Semester	Choose and begin research under the supervision of the student's supervising professor. Clinical training in Keio University Hospital
2nd Year	Whole Year	Clinical training and research in Keio University Hospital Training at an advanced cancer treatment partner institution (if desired)

### Cancer Professional (PhD) Program Outline (Ex.)

1st Year	Choose and begin research under the supervision of the student's supervising professor. Take courses in basic cancer biology and a range of clinical cancer medicine
2nd Year	Clinical department rotations (Plan and carry out rotations in departments of your choosing for 11 months). By rotating through various departments, students are able to experience actual treatment procedures in areas such as chemotherapy, molecular targeted therapy, radiation therapy, minimally-invasive surgery, palliative care, and rehabilitation
3rd Year	Clinical training and research in Keio University Hospital. Training at an advanced cancer treatment partner institution (if desired)
4th Year	Apply for PhD degree



# Clinical Research Professional Program

The Applied Medicine specialty course trains students to become professionals in designing and conducting clinical and epidemiological research focused on humans. Generally this program is suitable for those with the following research interests:

- 1 Clinical studies and epidemiological research in the field of clinical medicine
- 2 Medical technology research in all fields of medicine
- 3 Epidemiological research in the field of preventive medicine

To conduct high-quality clinical research, nursing staff and pharmacists, not only the physician, are crucial. Furthermore, a research coordinator, data manager, biostatistician, and others from a range of fields are all essential. Accordingly, this program is open to talented individuals from various fields, not only trained physicians. This program requires a certain level of experience and clinical expertise, so please consult with your desired supervising professor before the application period opens. Students can enter either the Medical Science or the Applied Medicine specialty, conduct research as outlined above, and attain the degree of PhD in Medicine. Please discuss this with your desired supervising professor.





# Shinanomachi Campus: A Global Medical Hub

## Opening its Doors to the World

In the PhD Program, courses are conducted in English providing a truly international and practical learning environment that does not draw a distinction between Japanese students and international students. PhD students are also strongly encouraged to study abroad and participate in overseas academic conferences in order to gain the skills necessary to succeed in the international arena.

In seminars hosted regularly by the Keio Medical Society and various departments, students can learn from leading researchers from Japan and abroad about the latest advances in medical research. At Keio, such international connections are considered essential for research.

In 2014 Keio University was selected to join the Japanese government's Top Global University Project as one of Japan's top universities providing a world-class level of research and education. Under this program, Keio is integrating its efforts through three transdisciplinary research and education initiatives focusing on longevity, security, and creativity in order to confront the numerous challenges facing modern society. Through collaboration in research and education as well as exchanges of faculty centered around these three conceptual clusters, Keio seeks to deepen ties with other leading universities across the world while advancing truly cutting-edge, interdisciplinary research. The Graduate School of Medicine is taking a leading role in the longevity cluster, and has welcomed Guest Professors (Global) from strategic partner

universities around the world to teach seminars and serve as advisors for graduate students.

Since the 1996, the Keio University Medical Science Fund has awarded The Keio Medical Science Prize yearly to recognize the outstanding and creative achievements of researchers in the fields of medicine and life sciences, in particular those contributing to scientific developments in medicine. The fund also provides grants to support the international research activities of young researchers, as well as to assist graduate students in attending academic conferences abroad.

Recent recipients of the Keio Medical Science Prize are:

- 2015: Jeffrey I. Gordon, Washington University School of Medicine in St. Louis
- 2015: Yosinori Ohsumi, Tokyo Institute of Technology
- 2016: Svante Pääbo, Max Planck Institute for Evolutionary Anthropology
- 2016: Tasuku Honjo, Graduate School of Medicine and Faculty of Medicine Kyoto University

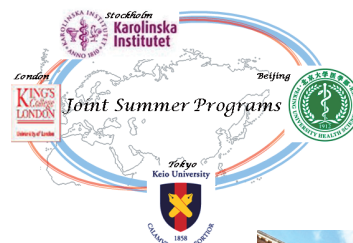


## Strengthening International Ties

In 2012, the Graduate School of Medicine PhD Program established a joint summer school program with Peking University and Karolinska Institutet, with King's College London joining in 2014. Every year, students take courses and participate in lab work at one of the participating universities and can earn transferable credits. There are plans to develop this program into a double degree program in the future.

The host schools and themes are:

- 2012: Keio University / Cell Biology and Metabolism
- 2013: Karolinska Institutet / Infection, Inflammation, and Immunology
- 2014: Peking University / Cancer
- 2015: King's College London / Cardiovascular
- 2016: Keio University / Stem Cell Research and Regenerative Medicine
- 2017: Karolinska Institutet / Brain Aging




Since 2008, Keio has partnered with the University of Texas MD Anderson Cancer Center and St. Luke's International Hospital in Tokyo to establish a joint educational platform called the Academy of Cancer Experts (ACE). The ACE's seminars and workshops are held in English and are taught by MD Anderson faculty members. The ACE's overarching goal is to train cancer research specialists who are equipped to take on the challenges that cancer poses to Japanese society, and it is steadily attracting Applied Medicine PhD students who are intent on leading the next generation of cancer research and treatment.




## List of PhD and Master's Program professors


### Professor Kazunori Nakajima

Affiliation	Anatomy	
Specialized Area	Mechanisms of cerebral cortical development	
Research Content	We are interested in the cellular and molecular mechanisms of how the cells in the central nervous system, in particular the cells in the cerebral cortex, are born, migrate to their final destinations, develop unique structures such as layers, and finally form such a complex network to enable the various higher brain functions. We are also investigating how these developmental processes are disturbed by various perturbations.	


### Professor Michisuke Yuzaki

Affiliation	Physiology	
Specialized Area	Synapse formation and plasticity as the basis of higher brain functions and neuropsychiatric disorders	
Research Content	Synapses are not only formed during development, but also continuously modified according to neuronal activities throughout adulthood. Synaptic plasticity is believed to be the basis of all higher brain functions, including learning and memory. Moreover, recent genetic studies have revealed that many neuropsychiatric disorders are caused by defects in genes encoding synaptic molecules. Thus, we aim to understand mechanisms by which synapses are formed, maintained and eliminated by neuronal activities using electrophysiological, molecular biological, and behavioral approaches.	


### Visiting Professor Makoto Suematsu

Affiliation	Biochemistry	
Specialized Area	Biochemistry of diseases, Gas biology	
Research Content	Investigating molecular mechanisms for genetic regulation of metabolism and metabolic regulation of genetics using advanced mass spectrometry	


### Professor Toru Takebayashi

Affiliation	Preventive Medicine and Public Health	
Specialized Area	Preventive medicine; environmental and occupational medicine	
Research Content	To achieve primary prevention for all in every community, my main research topic is tailor-made preventive medicine based on epidemiology with population-based cohort studies, combining multi-omics technologies, metabolomics in particular. Furthermore, pursuing social prevention efforts through establishing environmental and occupational standards for protecting population and workers' health through a scientific risk assessment process.	


### Professor Michiie Sakamoto

Affiliation	Pathology	
Specialized Area	Tumor pathology, Liver pathology, Molecular pathology, Pathology informatics	
Research Content	Analyze molecular mechanisms of human cancer development and progression. Establish precision pathologic diagnosis, quantitative pathologic diagnosis and information technology based pathology.	


### Professor Hideyuki Okano

Affiliation	Physiology	
Specialized Area	CNS development and regeneration	
Research Content	Elucidating the clinical states of neurological disorders, and research into regenerative medicine of the CNS using neural stem cells and iPS cell technology. Development of genetically modified primate techniques, creation of new models of neurological and mental disorders, and the elucidation of the mechanisms of brain development and higher level brain function.	


### Professor Masato Yasui

Affiliation	Pharmacology	
Specialized Area	Water Biology and Medicine: understanding in vivo water dynamics and the roles of aquaporins	
Research Content	A double-sided analysis of the structure-function relationship of aquaporins (water channels) consisting of a biochemical approach and molecular dynamic simulations. Furthermore, researching aquaporin regulation mechanisms and high-order functions, and building a basis for drug development.	


### Professor Haruhiko Siomi

Affiliation	Molecular Biology	
Specialized Area	RNA biology	
Research Content	Understanding molecular mechanisms underlying genomic quality control in light of stem cell formation and maintenance through characterizations of molecular pathways leading to transposon silencing including RNAi. In addition, understanding diseases caused by defects in RNAi and its related pathways.	

### Professor Tomonori Okamura


Affiliation	Preventive Medicine and Public Health	
Specialized Area	Public health; lifestyle-related disease; epidemiology; nutrition; community medicine; international collaborative research	
Research Content	We are seeking to identify new biomarkers that predict incidence of lifestyle-related diseases, and also developing novel lifestyle modification (diet, etc.) that will prevent various diseases through large-scale cohort studies and international collaborative studies. Also we are performing regional intervention research through health training and community education, health policy making studies (Health Japan 21, Data Health), and establishing clinical guidelines based on epidemiologic evidence.	

### Professor Yae Kanai


Affiliation	Pathology	
Specialized Area	Pathology; Cancer epigenetics; Integrative disease omics analysis	
Research Content	To participate in genome medicine and preventive/pre-emptive medicine by understanding the molecular mechanisms of diseases, therapeutic and diagnostic targets are explored based on integrative disease omics analysis, especially epigenome analysis, in human cancers derived from various organs, histopathologically-recognized precancerous lesions and cancer-prone metabolic and/or inflammatory disorders.	




### Professor Akihiko Yoshimura

Affiliation	Microbiology and Immunology	
Specialized Area	Molecular immunology; understanding disease centered around cytokines and inflammation	
Research Content	1. Analysis of immune regulation mechanisms by CIS/SOCS family genes and cytokines. 2. Analysis of cytokines and their signal transduction in various inflammatory diseases. 3. Functional analysis of Spred/Sprouty protein family. 4. T-cell reprogramming.	


### Professor Kenya Honda

Affiliation	Microbiology and Immunology	
Specialized Area	Immunology; microbiology; intestinal microbiota	
Research Content	Clarifying effects of the intestinal microbiota on the host physiology. Also investigating the mechanisms of host response to pathogens.	


### Visiting professor Shigeo Koyasu

Affiliation	Microbiology and Immunology	
Specialized Area	Immunology; cell biology	
Research Content	Analyzing the regulation mechanisms of natural and acquired immunity using molecular cell biological techniques and mouse models. Recently focusing on innate lymphoid cells.	


### Professor Masaki Q. Fujita

Affiliation	Legal Medicine	
Specialized Area	Forensic pathology; sudden death study	
Research Content	Investigating the pathogenesis and predisposition of sudden unexpected death syndrome in young Asian males by performing genetic and comparative epidemiological studies. Establishing objective diagnosis methods in forensic medicine.	


### Professor Hiroaki Miyata

Affiliation	Health Policy and Management	
Specialized Area	Health policy and management; Quality of healthcare; Epidemiology; Evaluation; Social science method	
Research Content	Health policy research and clinical research for i. Quality improvement initiative, ii. Healthcare technology/diagnosis/treatment innovation , iii. Sustainable, optimal healthcare system.	


### Professor Minoru Ko

Affiliation	The Sakaguchi Laboratory - Department of Systems Medicine	
Specialized Area	Stem cells; early embryos; systems medicine; genomics, informatics	
Research Content	Elucidating the structure and dynamics of gene regulatory networks; studying tissue regeneration and rejuvenation; promoting the extension of healthspan through the application of systematic and computational approaches to medicine.	


### Professor Yoshiaki Kubota

Affiliation	The Sakaguchi Laboratory - Department of Vascular Biology	
Specialized Area	Understanding the Formation of Vascular Networks	
Research Content	Unlocking the mysteries of the dynamics of how the blood vessel network is able to reach remote locations of the body using the latest imaging techniques. On this foundation, developing completely new molecular targeted treatments for cancer and ischemia, etc.	


### Professor Yutaka Kawakami

Affiliation	Division of Cellular Signaling, Institute for Advanced Medical Research	
Specialized Area	Investigation of immune-associated diseases (cancer, auto-immune disorders, etc.) and their modulation	
Research Content	Investigation of immune-associated diseases such as cancer and auto-immune disorders, and developing gene therapies and immunotherapies; Investigation of tumor immunomicroenvironment and developing molecular targeted therapies.	


### Professor Hideyuki Saya

Affiliation	Institute for Advanced Medical Research	
Specialized Area	Molecular mechanisms of malignant tumor formation	
Research Content	1) Developing new treatment strategies and property analysis of cancer stem cells; 2) Molecular analysis of the mechanisms of invasion, metastasis, and reoccurrence of cancer; 3) Analysis of the heterogeneous properties of cancer tissue structure and the plasticity of cancer cells.	

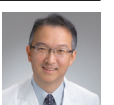
### Professor Keiichi Fukuda

Affiliation	Cardiology	
Specialized Area	Development of treatment methods for intractable heart failure through the regeneration of cardiac muscle cells	
Research Content	Cardiomyocyte regeneration using iPS stem cells to understand disease pathology, develop new treatments, and advance research in regenerative medicine. Developing multi-faceted research into the correlation of heart failure and sympathetic nerve function, the mechanisms of heart valve disease, and new treatment methods of pulmonary hypertension.	

### Professor Tomoko Betsuyaku

Affiliation	Pulmonary Medicine	
Specialized Area	Basic and clinical research concerning understanding and developing new treatments for respiratory illnesses	
Research Content	Molecular biological research concerning the pathology and pathogenesis mechanisms of lung cancer and inflammatory lung diseases such as chronic obstructive pulmonary disease (COPD), interstitial pneumonia, and bronchial asthma; establishing new diagnostic methods and treatments, and searching for markers which reflect a patient's condition.	

### Professor Takanori Kanai

Affiliation	Gastroenterology and Hepatology	
Specialized Area	Basic and clinical research of gastrointestinal immunity disorders	
Research Content	Clinical development of new drugs and treatments for IBD as well as liver and pancreatic immunity disorders. Developing preventive medicine that seeks to unify immunology, genetics, and nutritional science.	


# Faculty

## Professor Norihiro Suzuki

**Affiliation** Neurology

**Specialized Area** Understanding and developing treatments for cerebrovascular disease; dementia; degenerative neurological disorders, and headaches

**Research Content** 1) Development of new treatments for acute phase cerebrovascular disease and migraine; 2) Basic research for cerebrovascular neurogenic control; 3) Pursuing a neurotransmitter mechanisms of migraine and cluster headaches; 4) Creation and clinical applications of iPS cells in degenerative neurological disorders; 5) Investigating the causes of myasthenia gravis from autoantibodies; 6) Research of the mechanism of the remyelination impairment and axonal involvement in multiple sclerosis.



## Professor Tsutomu Takeuchi

**Affiliation** Rheumatology

**Specialized Area** The molecular mechanisms and regulation of autoimmune disorders, and the development of targeted treatments

**Research Content** Molecular analysis of the pathogenesis of autoimmune diseases (rheumatoid arthritis, systemic lupus erythematosus, etc.) and translational research towards the development of molecular targeting clinical applications.




## Professor Yuko Kitagawa

**Affiliation** General and Gastroenterological Surgery

**Specialized Area** Gastroenterology; surgical oncology; endoscopic surgery; multidisciplinary solid tumor therapy; surgical infections; bodily reactions to invasive surgery; sentinel node navigation surgery

**Research Content** Research utilizing an approach based on the sentinel node theory. Analyzing the mechanisms of metastasis of lymph node cancers and their regulation. Applying microscopic metastasis and capillary blood cancer cell detection methods to realize individualized, multidisciplinary treatment methods for digestive organ cancers. Research into reactions to invasive surgery, and surgery-related infections.




## Professor Hideyuki Shimizu

**Affiliation** Cardiovascular Surgery

**Specialized Area** Cardiovascular surgery; Endovascular stent-graft; minimally invasive cardiac surgery; organ protection methods; artificial heart and blood vessels

**Research Content** Developing surgical methods with a basis in implementing major surgery and minimally invasive treatments for cardiac and aortic diseases; and research on perioperative organ protection methods. Development of new treatments and diagnostic methods for aortic aneurysm and aortic dissection.




## Professor Kazunari Yoshida

**Affiliation** Neurosurgery

**Specialized Area** Surgical treatments for brain tumors; multidisciplinary treatments for malignant brain tumors; basicranial surgery; histological analysis of brain tumors

**Research Content** Developing surgical techniques based on surgical anatomy and analysis of clinical imaging of cranial diseases and brain tumors. Developing multidisciplinary therapies and diagnostics for malignant brain tumors (particularly germ cell tumors). Analysis of brain tumor malignancy using biological and histochemical techniques.




## Professor Masaya Nakamura

**Affiliation** Orthopedic Surgery

**Specialized Area** Spine and Spinal Cord Surgery, Spinal Cord Disorder Therapies, Neuroscience (Spinal Cord Regeneration, Growth factors, Neuroimaging)

**Research Content** Multicenter collaborative research on spine and spinal cord disorders. Developing regenerative medicine for musculoskeletal disorders, especially for spinal cord injury and new assessment methods through MRI and CT. Working on (1) iPS cell-based transplant therapies, (2) hepatocyte growth factors, (3) suppression of axonal growth inhibitors.




## Professor Shinichiro Okamoto

**Affiliation** Hematology

**Specialized Area** Basic and clinical studies on the pathogenesis of hematological malignancies and innovative therapeutic approaches with allogeneic stem cell transplantation and molecular targeting agents.

**Research Content** Targeting therapies for hematological malignancies with molecular targeted therapies; selective regulation of allo-immune reaction and potential use of this allo-reactivity for the eradication of MRD; Mechanisms of anti-tumor effects of the alloimmune response to umbilical cord blood transplant; QOL after treatment for hematological malignancies; new molecular targeted treatments and clinical research on MDS and myeloma, and basic research on the pathogenesis of hematological malignancies.




## Professor Hiroshi Itoh

**Affiliation** Nephrology, Endocrinology and Metabolism

**Specialized Area** Translational research on lifestyle-related diseases, metabolic syndrome and renal/vascular complications

**Research Content** Clarifying the endocrine and metabolic molecular mechanisms of metabolic syndrome associated with high blood pressure, diabetes, obesity, etc., and renal/vascular complications; translational research towards developing new treatments and applications from the perspectives of prevention, anti-aging medicine, and regenerative medicine.




## Professor Tatsuo Kuroda

**Affiliation** Pediatric Surgery

**Specialized Area** Cellular kinetics of pediatric cancer; pediatric cancer stem cells, fetal surgery

**Research Content** Basic research on cellular kinetics and cancer stem cells of pediatric cancers associated with clinical trials of new treatment strategies. Development of fetal diagnostic and surgical techniques.




## Professor Hisao Asamura

**Affiliation** General Thoracic Surgery

**Specialized Area** General thoracic surgery; thoracic oncology; TNM stage classification of cancer (UICC); cancer registry and database development; minimally invasive thoracic surgery

**Research Content** Multidisciplinary therapy of lung cancer, thymic epithelial tumor, pleural mesothelioma, and other thoracic malignancies; clinical trials including surgery for thoracic malignancies; TNM stage classification (UICC); development of minimally-invasive surgical techniques for lung cancers; lung cancer registry.




## Professor Morio Matsumoto

**Affiliation** Orthopedic Surgery

**Specialized Area** Spine Surgery, Minimally Invasive Spine Therapies, Scoliosis

**Research Content** Developing prosthetics necessary for spinal surgery. Identifying scoliosis susceptible genes and developing new assessment and surgical methods. Multicenter collaborative research on spine disorders. Researching spine aging through MRI machines. Researching the invasiveness of spine surgery.




## Professor Meigen Liu

**Affiliation** Rehabilitation Medicine

**Specialized Area** Rehabilitation Medicine, Neuroscience, Exercise Physiology

**Research Content** 1) Developing rehabilitation methods to induce plasticity of the central nervous system; 2) Development and clinical applications of brain machine interface; 3) Evaluation and prognosis prediction of injury; 4) Research concerning the exercise stress of disabled persons; 5) Advancing the research of cancer rehabilitation.






### Professor Kazuo Kishi

**Affiliation** Plastic and Reconstructive Surgery

**Specialized Area** Skin Regeneration (Including Skin Appendages)

**Research Content** Developing skin reproduction methods that utilize adult animal cells based on the phenomenon of skin regeneration in fetal mice, and analyzing its cellular and molecular mechanisms.




### Professor Tomonobu Hasegawa

**Affiliation** Pediatrics

**Specialized Area** Molecular Mechanisms of Human Growth and Sexual Differentiation

**Research Content** Analyzing the molecular mechanisms of human growth and sex differentiation (and disorders thereof) using human diseases and mouse models, while also developing new treatments for disorders of growth and sex development.




### Professor Daisuke Aoki

**Affiliation** Gynecology

**Specialized Area** Gynecologic Oncology, Gynecologic Pathology, Molecular Cytogenetics, Hereditary Cancer, Fertility-Preserving Therapy in Gynecological Cancer, Cancer Screening

**Research Content** Pursuing new preventive and therapeutic methods as well as the diagnostics of hereditary gynecologic cancers based on the analysis of genetics, epigenetics, and molecular cytogenetics; and also investigating the diagnostic performance of profiles of biomarkers in cancer cells.



### Professor Kazuo Tsubota

**Affiliation** Ophthalmology

**Specialized Area** Regenerative Medicine, Corneal Transplantation, Dry Eye, Refractive Surgery, Myopia, Presbyopia, Anti-Aging Medicine, Health Science, Food Science

**Research Content** Cornea regeneration; developing new treatments for and elucidating the mechanisms of dry eye associated with visual display terminals (VDT) and Sjogren's syndrome. Recently pursuing anti-aging medicine for age-related macular degeneration, cataracts, presbyopia, myopia, glaucoma, etc., while also expanding our outlook towards the health and food sciences.




### Professor Mototsugu Oya

**Affiliation** Urology

**Specialized Area** Understanding the Oncogenesis of Urological Cancers and Developing Novel Cancer Therapies

**Research Content** Aiming for an integrative understanding of the development of cancer from precancerous lesions and the mechanisms of metastasis; developing innovative new treatments with a focus on the cellular-biological features in cytokine production and neoangiogenesis, etc.




### Professor Masaru Mimura

**Affiliation** Neuropsychiatry

**Specialized Area** Neuropsychology and Geriatric Psychiatry

**Research Content** Elucidating and developing treatments and rehabilitation techniques targeted at higher-level brain function disorders and cognitive impairments caused by brain damage. Analyzing cognitive impairments of psychoneural disorders related to depression using functional neuroimaging.




### Professor Takao Takahashi

**Affiliation** Pediatrics

**Specialized Area** Developmental Neurobiology, the Cell Cycle, Neural Stem Cells, Neocortical Histogenesis

**Research Content** Research concerning mechanisms of developmental disorders of higher cortical function with a focus on proliferation/differentiation behavior of neural stem cells/progenitors in normal and abnormal histogenesis of the neocortex.




### Professor Hiroyuki Yamagishi

**Affiliation** Pediatrics

**Specialized Area** Pediatric Cardiology, Clinical Cardiac Development

**Research Content** Congenital heart disease (CHD) occurs in nearly 1% of all live births and is the major cause of infant mortality and morbidity. Our research for identifying genetic causes and molecular mechanisms of CHD is essential not only to fully understand the disease, but also to enhance current knowledge about new preventive and/or therapeutic strategies.




### Professor Mamoru Tanaka

**Affiliation** Obstetrics

**Specialized Area** Perinatal Medicine, Reproductive Medicine, Clinical Genetics, Embryology

**Research Content** Molecular biology concerning mammalian development; fetal medicine ranging from diagnostics to therapies; research and development of treatments of perinatal diseases utilizing mesenchyme stem cells.



### Professor Masayuki Amagai

**Affiliation** Dermatology

**Specialized Area** Autoimmunity, Allergies, Skin Barrier, Skin Immunity

**Research Content** Elucidating pathophysiological and immunological mechanisms in tissue-specific autoimmune disorders, and clarifying fundamental mechanisms of peripheral tolerance by analyzing the skin as an immune organ. Clarifying the mechanisms of allergy diseases at the molecular level from the point of view of skin barrier dysfunction, and developing novel therapeutic and preventive strategies. Elucidating the pathophysiological mechanisms of severe forms of drug eruption.




### Professor Kaoru Ogawa

**Affiliation** Otorhinolaryngology, Head and Neck Surgery

**Specialized Area** Protection and Repair of Inner Ear Sensory Cells, The Central Suppression Mechanisms of Tinnitus

**Research Content** Pursuing new treatments for chronic sensorineural hearing loss and tinnitus which are refractory in nature; 1) Regeneration of inner ear sensory cells (for hearing and balance); and 2) Research concerning cellular protective mechanisms against various kinds of damage such as acoustic trauma.




### Professor Masahiro Jinzaki

**Affiliation** Radiology

**Specialized Area** Diagnostic Radiology


**Research Content**

1. Constructing optimum image diagnostic algorithms in the field of cardiology and urology.
2. Aiming for further human-body visualization by developing new devices or techniques (microcirculatory system, lymphatic system, and peripheral nervous system).
3. Assessing clinical application of four-dimensional dynamic imaging.




# Faculty


## Professor Naoyuki Shigematsu

Affiliation	Radiotherapy	
Specialized Area	Radiation Oncology, Radiation Therapy, Radiation Biology	
Research Content	Radiation oncology; radiation biology In clinical research, performing adaptive magnification of stereotactic radiation therapy, intensity modulated radiotherapy, image-guided radiotherapy, as well as radiation within tissue and cavities in various types of cancer treatments. Also evaluating the effectiveness of chemotherapy combined with radiation therapy. In basic research, examining chromosome and genetic mutation as a result of radiation exposure; and molecular biological investigation to predict the efficacy of radiation therapy.	


## Professor Taneaki Nakagawa

Affiliation	Dentistry and Oral Surgery	
Specialized Area	Periodontology	
Research Content	1) Research on periodontopathic bacteria; 2) Research on oral tissue regeneration using mesenchymal stem cells and iPS cells; 3) Analysis of the sensitivity of antimicrobial agents against periodontopathic bacteria; 4) Clinical research on sonic toothbrush cleaning.	


## Professor Yusuke Tanigawara

Affiliation	Pharmacokinetics and Pharmacodynamics	
Specialized Area	Pharmacokinetics, Clinical Pharmacology	
Research Content	Researching drug disposition, pharmacodynamics, pharmacogenomics and pharmacometrics. The research includes elucidating the individual differences in drug response and development of optimal dosing methodology and drug response biomarkers, aiming towards precision medicine.	


## Professor Jun Kudoh

Affiliation	Collaborative Research Resources (Laboratory of Gene Medicine)	
Specialized Area	Medical genomics; Gene medicine	
Research Content	Developing genomic analytical methods in order to examine and explain the genetic/hereditary causes of monogenic and multifactorial disorders; as well as their pathogenic mechanisms at the molecular level.	


## Professor Michito Hirakata

Affiliation	Center for Medical Education	
Specialized Area	Medical pedagogy; Rheumatology; Clinical Immunology	
Research Content	Medical pedagogy: 1) Reform of the admission system, 2) Development of "Medical Professionalism", 3) Introduction of simulation, 4) Implementation of competency-based education, and 5) Establishment of continuous basic- and postgraduate- educational programs, to improve the Quality of Medical Education. Rheumatology: Investigating the production mechanism, clinical significance, and disease state mechanism of "autoantibodies", which are characteristic features of autoimmune disorders such as rheumatic diseases and connective tissue diseases.	


## Professor Matsuhiko Hayashi

Affiliation	Apheresis and Dialysis Center	
Specialized Area	Water and Electrolyte Metabolism, Kidney Differentiation and Regeneration, Understanding the Components of Vascular Calcification	
Research Content	Analysis of the physiological regulation mechanisms at the molecular level of the acid/base equilibrium and calcium/phosphorus metabolism of the kidneys. Also, by way of developing treatments for progressive renal damage, elucidating regenerative mechanisms of acute renal damage and researching the causes of vascular calcification observed with impaired renal function.	


## Professor Hiroshi Morisaki

Affiliation	Anesthesiology	
Specialized Area	Sepsis and Myocardial Function; Gastrointestinal Defense Mechanisms; Volatile Anesthetics and Microcirculatory Disorders; Epidural Anesthesia and Immune System	
Research Content	Clarifying the underlying mechanisms of host defense system against invasive stress. We are currently engaged in both basic and clinical research regarding protective approaches for myocardial dysfunction during sepsis and gut barrier function in the critically ill, and modulation of the immune system by epidural and/or inhalational anesthesia.	


## Professor Mitsuru Murata

Affiliation	Laboratory Medicine	
Specialized Area	Genetic Testing, Clinical Lab Standardization, Understanding and Preventing Thrombotic Disorders, Basic Platelet Research	
Research Content	Researching, standardizing and spreading the use of clinical tests in medical practice using genome information and genetic analysis techniques. Elucidating the mechanisms of blood clot formation from a molecular perspective, and through identifying hereditary and acquired risk factors, establishing effective preventions and treatments. Basic research of blood platelet formation and establishing evaluation methods of platelet function.	

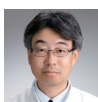
## Professor Junichi Sasaki

Affiliation	Department of Emergency and critical care	
Specialized Area	Acute medicine, traumatology, burn care, surgical infections, infection prevention and control, biological reactions and pharmacokinetics under invasive stress	
Research Content	Analysis of biological reactions under invasive stress conditions using two-hit animal models (endotoxin administration after burn priming, etc.) and analysis of pharmacokinetics as it relates to antimicrobial and antifungal drugs in critically ill patients Regenerative medicine in critical care (such as the application of cell technology for burn treatment)	


## Professor Koichi Matsuo

Affiliation	Collaborative Research Resources (Laboratory of Cell and Tissue Biology)	
Specialized Area	Bone cell biology	
Research Content	Elucidating the development and homeostasis of the skeleton through cell-cell interaction.	

## Professor Hidekazu Suzuki

Affiliation	Center for Medical Education	
Specialized Area	Medical Education; Gastroenterology and Hepatology; Medical Bioinformatics; Clinical and Molecular Oncology; Clinical Pharmacology and Nutrition; Primary Care Medicine	
Research Content	Course director of MD-PhD program; Professional medical education; Graduate medical education; Big clinical data-driven research; Clinical trial; Regulatory medicine; Diagnostic and therapeutic approach to organic and functional gastrointestinal diseases; Pathophysiology, diagnosis and treatment of Helicobacter pylori infection; Clinical pharmacology and nutrition.	

## Professor Haruhiko Ogata

Affiliation	Center for Diagnostic and Therapeutic Endoscopy	
Specialized Area	Pathogenesis and development of treatment for inflammatory bowel disease, endoscopic diagnosis and treatment of gastrointestinal disease.	
Research Content	Understanding the pathogenesis of inflammatory bowel disease by image enhancing and in vivo observation of the gastrointestinal mucosa using endoscopic devices equipped with super-magnifying functionality and capsule endoscopes equipped with additional functionality that can achieve pan-enteric surveillance.	




**Professor Naohisa Yahagi**

**Affiliation** Cancer Center (Advanced Minimally Invasive Therapy Unit)

**Specialized Area** Minimally Invasive treatment for Gastrointestinal Neoplasia

**Research Content** Developing new procedures for advanced minimally-invasive treatments such as endoscopic resection and laparoscopic resection. And developing new therapeutic instruments for advanced minimally-invasive treatments, including NOTES (natural orifice transluminal endoscopic surgery) and LECS (laparoscopy and endoscopy combined surgery).



**Professor Hideo Matsumoto**

**Affiliation** Institute for Integrated Sports Medicine

**Specialized Area** Sports Medicine, Sports Science, Knee Surgery, Biomedical Engineering

**Research Content** Research aimed at improvement of sports performance and prevention of sports injuries and disorders, using 3D motion analysis in sports and activities of daily living. Research and development of artificial joints for sports recovery in athletes. Research of sports medicine including sports and health, sports nutrition, and sports psychology.




**Professor Kenjiro Kosaki**

**Affiliation** Center for Medical Genetics

**Specialized Area** Clinical Genetics, Teratology, Pediatrics

**Research Content** 1) Clinical genomics including diagnosis and management of rare diseases and genetic counseling. 2) Elucidation of genetic causes of genetic diseases with a focus on "undiagnosed diseases".




**List of Master's Program professors**

**Professor Taiji Furuno**

**Affiliation** Physics

**Specialized Area** Interfaces in Biophysical Chemistry, Bioimaging

**Research Content** Creating two-dimensional (2D) protein arrays using the air-water interface and immobilizing them after transfer onto a solid surface; and performing structural evaluations under physiological conditions using an atomic force microscope. Currently performing immobilization of an oriented dense 2D packing of Streptavidin, and research concerning the application toward protein microarrays (or protein chips).




**Professor Mayumi Kajimura**

**Affiliation** Biology

**Specialized Area** Coupling of brain blood circulation and metabolism

**Research Content** The phenomenon of the connection between local nerve action and metabolism in cerebral blood flow is known as neurovascular coupling (NVC). We seek to elucidate the actual molecular action of NVC which forms the basis of cerebral metabolic regulation through the evaluation of spatial-temporal uneven information of low-molecular metabolites (such as when, where, and how much). <<http://k-ris.keio.ac.jp/Profiles/74/0007369/profile.html>>




**Professor Hiroyoshi Inoue**

**Affiliation** Chemistry

**Specialized Area** Radiology, Pharmaceutical Chemistry, Natural Products

**Research Content** I am responsible for radiation health and safety at Keio University's Shinanomachi Campus. Our research is primarily interested in developing ways to safely concentrate and dispose of radioisotopes. In addition, we are interested in developing biosensors using isotopic marking and aptamer technology for age related disease diagnostics and food monitoring. Another aspect of our research focuses on the identification of useful functional components from nature and ways to develop these for synthetic applications.




**Professor Masatoshi Nara**

**Affiliation** Letters

**Specialized Area** Ethics, Medical Ethics

**Research Content** Applying ethical theories and methodologies to analyze ethical problems raised in clinical medicine and medical research. Recently focusing on ethical problems in reproductive medicine, misconduct in medical research, protection of personal information, and conflict of interest.



**Professor Hiroshi Nakamura**

**Affiliation** Business

**Specialized Area** Industrial Organization (Life Science and Health Care Industries), Strategic Management

**Research Content** Organizational reform and management strategies of companies in order to bring about innovation in the life science industries-Policies concerning the creation of innovative products while reducing economic/financial burden on patients and governments-Cooperation among different types of occupations and functions in healthcare




**Professor Tomofumi Anegawa**

**Affiliation** Business

**Specialized Area** Health Economics, Applied Economics

**Research Content** Applying economics to analyze medical care, education, energy, and other related industries. In particular, studying the economics of drugs, the medical device industry and intellectual property rights, and geographical variation in medical care. Furthermore, establishing a grand design for cross-disciplinary and multi-generational research and education as a key to realize healthy aging.



# Student Voices

## Master's Program

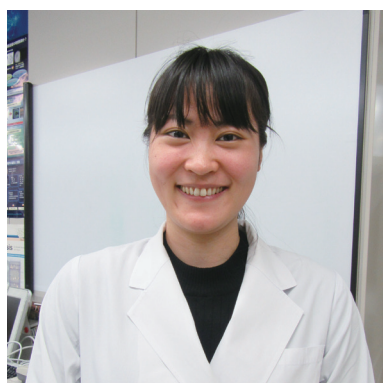
I joined the Master's program from the undergraduate program in the Department of Biosciences and Informatics in the Faculty of Science and Technology. In the Master's program, I am dealing with a wide range of subjects from basic biology to clinical medicine, and since joining the program, I have expanded my outlook to the fields of medical science compared with my undergraduate studies which mainly focused on science and technology. I feel that this will have a big impact on my future career path.

Now, I am researching the molecular mechanisms of synapse formation and maintenance and synapse plasticity which forms the basis for learning and memory. My lab in the Department of Physiology has doctors and instructors from a number of backgrounds, not only medicine. I have many opportunities to learn every day, and I feel it's a very favorable environment in which to pursue my research. Receiving specialized instruction and insight from each of them allows me to make use of various experimental methods in my research.



2nd Year Master's Student  
**Kazuya Nozawa**  
Department of Physiology

## PhD Program



2nd Year PhD Student  
**Seika Inoue**  
Department of Anatomy

I developed an interest in neuroscience through my experiences as a swimmer for 20 years, and in order to further understand the functioning of the brain and contribute to humanity by uncovering the connection between pathologic conditions and neurological diseases, I decided to join the PhD program. Now I am a member of the Nakajima Lab in the Department of Anatomy, and I'm studying the mechanisms of early neocortex formation and growth.

Although all of the lectures in the PhD program are in English, they are well structured and easy to comprehend. In many lectures, I felt intellectually stimulated by different ways of thinking and communicating ideas. Furthermore, it goes without saying that the research facilities are excellent, there are a large number of female researchers, and through energetic interaction with researchers from a variety of backgrounds, the environment in the lab always enhances my mindset towards research. Spending every day in this type of environment enables me to do truly rewarding work.

Research is complex and doesn't always go as planned, but I am thankful every day to work in an environment doing cutting edge research alongside many talented people, and I intend to keep working hard at my research from now on.

## International Student in the PhD Program

I am working to uncover the molecular mechanisms of myopia (near-sightedness) as a member of the Laboratory of Photobiology in the Department of Ophthalmology. When I was a medical student in China, I became keenly aware of the need not only to acquire clinical skills, but also of the importance of gaining a basic understanding of molecular mechanisms in combating diseases. In order to become a doctor that can truly be of service to patients, I decided to join the Keio University Graduate School of Medicine in the Department of Ophthalmology. My first year passed by quickly, and my daily work has felt more like I'm having fun instead of an obligation.

Research aimed at unlocking the mysteries of vision at the molecular level to develop treatments and finally bring benefits to patients is not only necessary, but the process itself is fascinating and exciting to me. That process - identifying a problem, developing a hypothesis, and designing an experiment to prove it - is the best aspect of research, and is an incredibly valuable experience I am only able to have as a graduate student.



2nd Year PhD Student  
**Jiang Xiaoyan**  
Department of Ophthalmology



# Scholarships

A variety of scholarships are available for students who wish to study at Keio University. Please read the criteria carefully to check which ones you are eligible for.

## ■ Before Enrollment

Two major scholarships for students seeking admission to the Graduate School of Medicine are:

- MEXT (The Japanese Ministry of Education, Culture, Sports, Science and Technology) Scholarship

Embassy recommendation / University recommendation

Please visit: <http://www.ic.keio.ac.jp/en/study/mext/index.html>

- Keio Design the Future Award

The Graduate School of Medicine will recommend one nominee to the Award Committee from among the students who passed the entrance examination. If the student passes the final selection by the Award Committee, they will receive reimbursement of all academic fees and a monthly stipend after entering Keio.

Please visit: <http://www.ic.keio.ac.jp/en/life/scholarship/dfaward.html>

## ■ After Enrollment

There are three main categories according to sponsors and some scholarships are only for privately financed international students.

For scholarships now available for current students (privately financed international students),

Please visit: <http://www.ic.keio.ac.jp/en/life/scholarship/available.html>

## ■ Offered by Keio University

For all graduate students:

Name of Scholarship	Eligibility	Yearly Stipend	Application Period
Keio Graduate School Scholarship	Graduate students who have high motivation for academic achievement, an excellent academic record, good character, and financial difficulty in paying study-related expenses.	Maximum: JPY 600,000	April or May
Shinzo Koizumi Foundation Scholarship	Graduate students except for final year who have high motivation for academic achievement, an excellent academic record, good character, and financial difficulty in paying study-related expenses.	JPY 360,000	October or November

School-Specific Scholarships for Graduate School of Medicine students :

Name of Scholarship	Purpose	Eligibility	Yearly Stipend	Application Period
Master's Program Scholarship	To encourage master's students to pursue their education further in Keio's PhD programs.	2nd year Master's students who will continue to a PhD program in the following year.	Maximum: JPY 1,000,000	February
Keio Research Encouragement Scholarship	To develop future international research leaders in various fields.	Highly motivated 1st year Master's students showing great research promise.	JPY 300,000	April
Doctoral Program Scholarship	To encourage and support students in their PhD studies.	1st and 2nd year PhD students; also 3rd and 4th year doctoral students who exhibit excellence in research.	Maximum: JPY 600,000	July
Ichiro Ushioda Memorial Scholarship	To train high-quality researchers in the PhD programs.	PhD students with excellent character and academic performance.	Maximum: JPY 360,000	November
Fumon and Fusako Ohtsuka Special Memorial Scholarship	To develop future leaders of medicine in Japan.	PhD students with excellent character and academic performance.	Maximum: JPY 1,000,000	November

## ■ Offered by JASSO

JASSO is an independent administrative institution established under MEXT (The Japanese Ministry of Education, Culture, Sports, Science and Technology). JASSO provides a scholarship to self-supporting international students.

Name of Scholarship	Eligibility	Monthly Stipend	Application Period
Monbukagakusho Honors Scholarship	Privately Financed International Students	JPY 48,000	April

## ■ Offered by private foundations and local governments

For scholarship offered by private foundations and local governments, please visit the International Center's website:

<http://www.ic.keio.ac.jp/en/life/scholarship/>

# Degree Figures | Tuition and Fees

## Master's Degrees Awarded [As of April 1, 2017, number of female graduates indicated in parentheses]

1994 - 2016 Total*	Master's Degree	341 (178)
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\*The Master's Program was established in 1994

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Degrees	22 (11)	18 (8)	23 (11)	28 (9)	19 (11)	17 (11)	16 (9)	15 (11)	24 (12)	13 (4)	6 (3)

## PhD Degrees Awarded [As of April 1, 2017, () indicates number of women in the total]

1952 - 1991 Total	Doctor of Medical Science	2,257 (140)
1991 - 2016 Total	PhD in Medicine	2,564 (448)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Degrees	92 (17)	87 (17)	108 (31)	103 (23)	101 (23)	83 (15)	131 (27)	119 (27)	112 (27)	117 (33)	119 (30)

## Tuition and Fees (2017)

Master's	Registration Fee	Tuition Fee	Total First-Year Fees
	JPY 60,000	JPY 1,320,000	JPY 1,382,600

PhD	Registration Fee	Tuition Fee	Total First-Year Fees
	JPY 60,000	JPY 1,110,000	JPY 1,172,600

# Maps and Contact Information

**Shinanomachi Campus** 35 Shinanomachi, Shinjuku-ku, Tokyo 160-8582

**[ TEL ]** Office of Student Services  
(Admissions): 03-5363-3662 (Scholarships): 03-5363-3665

**[ MAIL ]** Inquiries: medgrad@info.keio.ac.jp

**[ TRAIN ]** JR Chuo/Sobu Line (1 minute walk from Shinanomachi Station)

