



2022



慶應義塾大学大学院 医学研究科



Keio University
Graduate School of Medicine



2022



Blazing a Path for the Future of Medicine

Bringing Together and Educating World-Class Minds



Message from the Dean

Hideyuki Okano,
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.

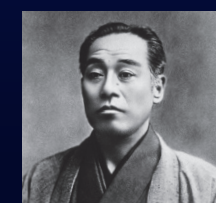
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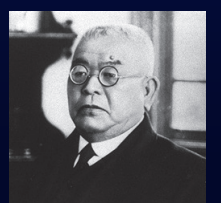
HISTORY OF KEIO MEDICINE

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

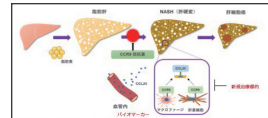


Shibasaburo Kitasato
First dean of the School of Medicine
1853 - 1931

After Graduation: **Instructor Department of Gastroenterology Keio University School of Medicine**

- Young Investigator Award (JDDW2018)
- Young investigator bursary (EASL ILC 2019)
- Young investigator Award (APASL STC 2019)

Due to lifestyle changes, the number of patients with nonalcoholic steatohepatitis (NASH) is on the rise, with some cases leading to complications such as cirrhosis and hepatocellular carcinoma. The detailed mechanism of NASH is still unknown, and few effective therapeutic agents exist. In recent years, it has been reported that the immune system is involved in pathogenesis and is expected to be a new therapeutic target for NASH. In this study, we have shown for the first time that the chemokine receptor CCR9 and its ligand CCL25 are directly involved in liver fibrosis and NASH-related hepatocarcinogenesis. We analyzed 65 NASH patient samples and mouse models and found that CCR9 is highly expressed in macrophages and astrocytes in the liver and that CCR9 deficiency suppresses liver fibrosis and hepatocarcinogenesis. We also clarified that administration of CCR9 antagonists suppressed the progression of fatty liver to NASH, which opens up possibilities for new therapeutic applications. The results of this study are expected to lead to the development of new biomarkers and novel therapies for NASH.



Message to Prospective Students

I decided to pursue the doctoral course at the Graduate School of Medicine, knowing that I would be able to engage in medicine more broadly with exposure to both basic and clinical medicine. I also had many stimulating experiences beyond my on-campus research. I had opportunities to present at international conferences and discuss directly with researchers from around the world. The valuable opportunity to learn from leading researchers and hone my critical thinking and research skills will be useful for the rest of my career.



Message
01

Rei Morikawa

(2020 Graduate)

PhD Degree Thesis:
Role of CC chemokine receptor 9 in the progression of murine and human non-alcoholic steatohepatitis.

After Graduation: **Department of Urology Kawasaki Municipal Hospital (Visiting Research Fellow Department of Urology Keio University School of Medicine)**

- General Assembly Award at the 107th Annual Meeting of the Japanese Urological Association
- Research Encouragement Prize at the 6th Annual Meeting of the Japan Society of Urological Oncology
- 2020 Keio University Graduate School Doctoral Program Grant
- 2020 Keio Medical Otsuka Fumon / Fusako Fellowship

My research at the Keio University Graduate School of Medicine focused on the search for new treatments for patients with transitional cell carcinoma (TCC) after acquiring anticancer drug resistance. I focused on mucin 1-type C-terminal peptide (MUC1-C), which is a glycoprotein with multiple functions in cancer cells, and found that MUC1-C is expressed in CDDP-resistant bladder cancer cells. I also found that MUC1-C may be involved in the drug efflux protein MDR1 through activation of the PI3K/AKT signaling pathway and that MUC1-C enhances antioxidant capacity by contributing to the stabilization of the cystine/glutamic acid transporter (xCT), resulting in CDDP resistance. I also confirmed, for the first time in Japan, that the sensitivity of CDDP-resistant uroepithelial cells can be partially restored in combination therapy with CDDP using an imported MUC1 inhibitor that is currently undergoing clinical trials overseas. In addition to the above, as part of my clinical research, I also performed a postoperative follow-up model for patients with renal pelvico-ureteral cancer, a rare form of cancer, using the advanced statistical Weibull function to calculate the risk of cancer death over time by age.

Message to Prospective Students

There are relatively few people from surgical clinical departments who go on to graduate school. I, too, was unsure about graduate school, but as clinical questions arise in the course of daily clinical practice, I believe that dedicating time to basic research as a way of resolving and exploring these questions will add depth to, and ultimately enrich, the life of any physician. An education at Keio is an invaluable and exciting opportunity to learn from many of the world's top researchers. I highly recommend this program to anyone who wants to explore the unknown and integrate other fields into their own specialization.

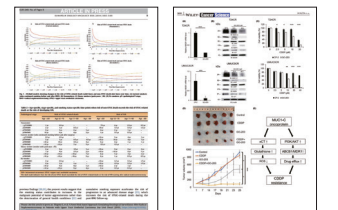


Message
02

Keisuke Shigeta

(2020 Graduate)

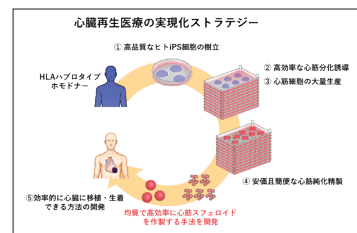
PhD Degree Thesis:
Role of the MUC1-C oncoprotein in the acquisition of cisplatin resistance by urothelial carcinoma



From Bench to Bedside Medical Researchers With a Bright Future Special Messages

After Graduation: **Doctoral Program Student Graduate School of Medicine Keio University**

Although the most definitive option for severe end-stage heart failure is cardiac transplantation, it has not become a standard treatment due to the extreme shortage of donors, resulting in a need for alternative treatment methods. My laboratory is working on transplanting high-purity cardiac spheroids into the heart as one possible alternative treatment for patients with severe heart failure, but we are faced with the challenge of producing homogeneous spheroid cultures in large amounts. This led me to develop the "aspiration method," a new method for preparing spheroids. Compared to spheroids produced by conventional spontaneous sedimentation, spheroids produced by this new method are more efficient and homogeneous in each of the two human induced pluripotent stem cell (hiPSC) lines and hiPSC-derived cardiomyocytes. I also found that the aspiration method improved the variability of the beating rate of myocardial spheroids. So we believe that we were able to significantly improve the method of spheroid production.



Message to Prospective Students

The master's program at Keio attracts students from a variety of backgrounds, which afforded me a wide range of insights. My time at graduate school was a very enjoyable and meaningful time for me. Even within my lab, I was blessed with professors and senior students whose guidance helped me grow significantly as a researcher. I hope that you, too, will take this once-in-a-lifetime opportunity as a graduate student in such a diverse environment to delve deeper into your studies and the things that interest you.



Message
03

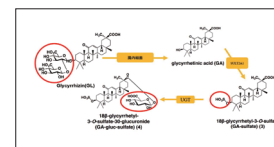
Taijun Moriwaki

(2020 Graduate)

Master's Degree Thesis:
Developing a Novel Spheroid Culture System

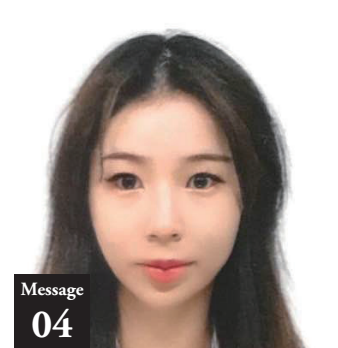
After Graduation: **Doctoral Program Student Graduate School of Medicine Keio University**

Pseudoaldosteronism is a known side effect of glycyrrhizin (GL), which is found in black licorice. GL metabolites, including GA-3-O-sulf (metabolite 3) and GA-3-sulf-30-gluc (metabolite 4), which are taken up into renal tubular epithelial cells to serve as substrates for organic anion transporters 1 and 3 and have inhibitory activity on type 2 11 β -hydroxysteroid dehydrogenase, were previously identified from blood samples of Eisai hyperbilirubinemic rats (EHBR), which lack multidrug resistance-associated protein 2 (Mrp2). Metabolite 3 was detected in high concentrations in the sera of patients with licorice-induced pseudoaldosteronism and was thought to be involved in its pathogenesis, but the role of metabolite 4 is still unclear. In this study, we investigated the relationship between metabolite 4 and the pathogenesis of patients with pseudoaldosteronism.



Message to Prospective Students

The first year of the master's program mainly consisted of lectures and observing various research projects in the lab. My research began in earnest during my second year when I started having frequent meetings with my academic advisor, who kept up with the progress of my project to ensure that I would achieve my desired outcomes. After studying at Keio, I tried to share the best aspects of China and Japan with the world to promote further exchange between the two cultures. I highly recommend that incoming students make use of the library's vast collections and participate in various conferences to broaden their horizons during their time at Keio. I also make a point of staying in touch with my professors and continue to look for international exchange opportunities.



Message
04

Lian Fangyi

(2020 Graduate)

Master's Degree Thesis:
Relationship between 18 β -glycyrrhetyl-3-O-sulfate-30-glucuronide and laboratory marker or clinical symptoms of licorice-induced pseudoaldosteronism



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/>



Admissions Policy

The Graduate School of Medicine is open to anyone, regardless of nationality, and trains medical professionals who possess advanced knowledge and research ability, welcoming students who possess the following traits:

● Master's Program

- Individuals who have studied in fields related to the natural, humanities and social sciences and have basic knowledge of medicine and life sciences
- Individuals who have a desire to become a professional with specialized skills and an in-depth knowledge of medicine and medical care, or are highly motivated to go on to a doctoral program
- Individuals who can read, understand, critique, and have constructive discussions about medicine and life science papers written in English

● Doctoral Program

- Individuals who have sufficient basic knowledge of medicine and life sciences and have completed a master's program or six-year medical, dental, veterinary or pharmaceutical course
- Individuals who are motivated to become world-class medical researchers
- Individuals who can read, understand, critique, and have constructive discussions about medicine and life science papers written in English

Curriculum Policy

● Master's Program

Master's program aim to develop professionals and researchers with advanced, specialized skills in medicine and medical care. Students take core program classes in the form of lectures and learn how to conduct research as they write their master's thesis. The curriculum is organized so that each student can understand current and future trends in medicine and medical care as they relate to their desired career path.

As a general timeline, students file their course registration in April of their first year and begin taking courses and conducting research in close consultation with their academic advisor. In July of their first year, students must submit a two-year research plan and receive approval from the Graduate School of Medicine Committee in order to ensure that their research can be securely carried out in the long term. During their first year, students will generally earn all of the credits needed for core and minor subjects. After a master's thesis presentation in October of their second year, students submit their thesis around January, followed by their thesis defense around February. If their thesis is approved by the Graduate School of Medicine Committee, they will receive their master's degree by March.

● Doctoral Program (Medical Sciences Program)

The doctoral program curriculum is practical and hands-on, with all core subjects taught in English. This curriculum, together with other invaluable learning opportunities, such as the Keio Medical Society

Seminars, which bring researchers from around the world to Keio, allows the Graduate School of Medicine to train researchers who are internationally-minded and have the skills required to develop their own research. Students can also conduct research that counts toward their degree at domestic partner research centers and institutes that include the National Cancer Center, RIKEN Center for Brain Science, and the Shizuoka Cancer Center. The Keio School of Medicine also has relationships with world-class research institutions such as the Broad Institute of MIT and Harvard (US), the Karolinska Institute (Sweden), the UCSF Gladstone Institute (US), the University of California San Diego (US), and INSERM (France) to provide students opportunities to further develop their research through joint research and study abroad.

● Doctoral Program (Applied Medicine Program)

The Doctoral Program in Applied Medicine has both an oncology and a cardiology track, each of which is built upon a unique curriculum centered on lectures and papers.

As a general timeline for both tracks, students file their course registration in April of their first year and begin taking courses and conducting research in close consultation with their academic advisor. In July of their first year, students must submit a two-year research plan and receive approval from the Graduate School of Medicine Committee in order to ensure that their research can be securely carried out in the long term. By the end of their second year, students will generally earn all of the credits needed for core and minor subjects. After the Screening for Completion of Course Requirements in May of their third year, students must submit their doctoral dissertation by December of their fourth year. If approved by the Graduate School of Medicine Faculty Meeting, they will have their dissertation defense around January. If their dissertation is approved by the Graduate School of Medicine Committee, they will receive their doctoral degree by March.

Diploma Policy (Degree Conferral Policy)

● Master's Program

Students must be enrolled in a master's program for at least two years, complete all coursework, and earn the required number of credits as specified in the program outline. Students must engage in research under their academic advisor, present progress reports on their thesis and receive advice and instruction from experts other than their academic advisor, after which they will submit their thesis. When submitting their thesis to be reviewed for thesis defense, students will present their research to a review committee, who will expect them to answer questions from committee members and will consider how they have incorporated the advice they received into their research. Final approval of their thesis will be made by the Graduate School of Medicine Committee.

● Doctoral Program

They must be enrolled in a doctoral program for at least four years (those with outstanding research achievements may be eligible in three years), complete all coursework, and earn the required number of credits as specified in the program outline. They must engage in research under their academic advisor, present progress reports on their dissertation and receive advice and instruction from experts other than their academic advisor, after which they will submit a final original dissertation in English or a dissertation that summarizes several examples of their published research. Dissertation defense will be opened internally and they will present their research and lab notes to a review committee, who will expect them to answer questions from committee members and will consider how they have incorporated the advice they received into their research. After the defense, final approval of their dissertation will be made by the Graduate School of Medicine Committee.

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.

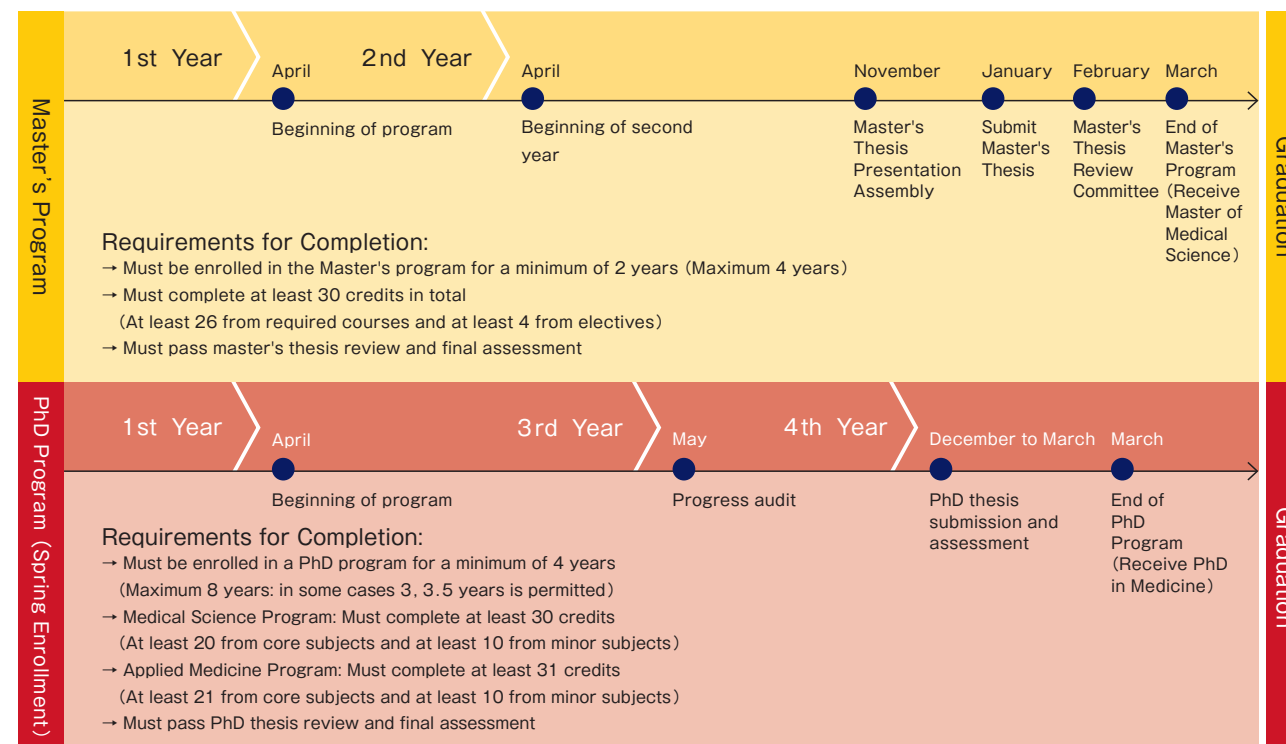
The program seeks to advance cooperative research with outside research institutions and organizations; and seeks to encourage high-quality, fruitful research through the uninhibited interaction between doctoral students and other researchers at Keio, as well as with researchers from industry. Students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

Research Facilities

Excellent medical research relies as much on human effort and ingenuity as it does on state-of-the-art facilities and equipment. The Keio University Graduate School of Medicine provides access to both, with cutting-edge facilities that include Shinanomachi Campus' Collaborative Research Resources, Laboratory Animal Center, RI Center, and Kitasato Memorial Medical Library. The Kitasato Memorial Medical Library boasts a rich collection of books and access to over 11,000 medical e-journals. Collaborative Research Resources (Animal Facility) cares for and works with mice and other animals. Collaborative Research Resources (Core Facility) provides microarray analysis equipment, next-generation sequencers, cell sorters, laser scanning microscopes, super-resolution microscopes, 3D X-ray microscopes, histological analysis equipment, electron microscopes, and more for a total of over 200 types of analysis equipment necessary for all manner of life sciences research, including omics, imaging, and disease modeling. With a simple registration process, all researchers—including students at the master's and doctoral levels—can use these facilities and receive technical support in a first-rate research environment.



Degree Granting Process





Entrepreneurship Course (Master's Program)

About the Entrepreneurship Course

In recent years, the role of the university has been redefined. The new mission of the university is not to merely produce educators and researchers, but to train entrepreneurs who can spark revolutions and usher in next-generation industries. In light of this, the Entrepreneurship Course has been added to the Master's Program to supplement the extensive medical education offered by the Graduate School of Medicine.

As entrepreneurship education in the field of health care continues to develop in Japan, it is expected that many medical schools and pharmacy programs will launch their own university-backed ventures in the coming years. This course aims to train medical professionals well-versed in the management of new ventures through an understanding of both medicine and business.

Course Outline

In this course, students will complete an entrepreneurship training program in addition to the usual required and elective courses of the master's program at the Graduate School of Medicine. Students will take all of the following four courses (15 class slots each).

- ACQUIRING ENTREPRENEURSHIP SKILLS
- INNOVATION IN HEALTH AND MEDICINE
- REGULATORY SCIENCE
- EMERGENCE OF DATA DRIVEN SOCIETY AND STRATEGY

Self-funded summer training programs in Silicon Valley and other relevant locations are also available to students who wish to study abroad.

In addition, students are encouraged to participate in the Keio School of Medicine's Healthcare Venture Contest and other events including the Keio University School of Medicine Industry-Academia Partnership Lectures and the Keio Visionary Café.

Graduate School of
Medicine Master's
Program

+

Entrepreneur
Training

=

Entrepreneurship



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. In 2017, we have started new Cancer Professional training plan with government support for training various cancer professionals who can take care of cancer patients with medically and socially different backgrounds.

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

● Master's Program

Cancer Rehabilitation Therapist / Researcher Course

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)

[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 clinal oncology specialist course / Surgical oncology specialist course / Radiation oncology specialist course / Palliative care specialist course / Rehabilitation specialist course / Medical physicist course/ Cancer translational research course

[Clinical Research Track] Advancing translational research from basic research to clinical applications

Cancer translational research 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.)

1 st Year	Spring Semester	In addition to required courses for master's degree, additional credits are taken in Cancer Professional 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.)

1 st 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)
4 th Year	Apply for PhD degree



Clinical Research Professional Program

The Applied Medicine Program 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 speciality, 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 Our Doors to the World

Most core subjects in the Graduate School of Medicine doctoral programs—including Special Medical Lectures, Medical Science Methodology, and Medical Ethics—are conducted in English. This provides a truly international and practical learning environment that does not distinguish between Japanese and international students, with an increasing number of international students enrolled in the Graduate School of Medicine each year. We now have 53 international students working and learning together as of April 2021, up from 18 in 2016 and 35 in 2019. International researchers can be found in every laboratory, and many other students from medical schools abroad visit through our short-term programs.

Our overseas collaborations in education and research continue to become stronger every year. Since 2018, as part of our special medical lectures, an online lecture series focused on aging and longevity is jointly held by Cologne University in Germany, the Keio University

Graduate School of Medicine, and the Keio University School of Economics. During the 2020 academic year, courses were held online and on-demand.

Doctoral students are also strongly encouraged to study abroad and participate in international academic conferences to gain the skills necessary to succeed globally. We also bring international expertise to Keio through the Keio Medical Society and other departments, which hold regular seminars where students can learn from leading Japanese and international researchers about the latest advances in medical research. At Keio, these kinds of international connections are considered essential for research.

Despite overseas travel restrictions due to the COVID-19 pandemic, engagement in international joint research projects has continued at a clip.

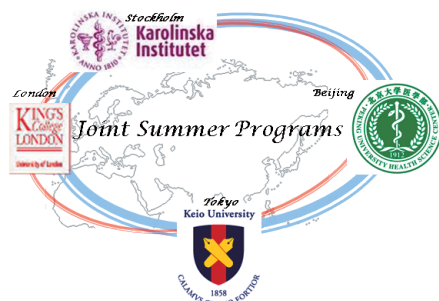
Strengthening International Ties

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
- 2018: Peking University / Chronic Inflammation
- 2019: King's College London / Big Data in Healthcare

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.



International Research Collaboration

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. The Keio University Global Research Institute (KGRI) was established in November 2016 to facilitate the further globalization of Keio in its standing as an international research university. At KGRI, Keio is integrating its efforts through three transdisciplinary research and education initiatives focusing on longevity, security, and creativity 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.



International Research Support

Each year since 1996, the Keio University Medical Science Fund has awarded The Keio Medical Science Prize 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. It is the only prize of its kind awarded by a Japanese university, with eight recipients having gone on to become Nobel Laureates. Each year, an award ceremony and commemorative lecture are held on Keio University's Shinanomachi Campus.

The fund also provides research grants for early-career researchers (up to 3 million yen/project, 10 million yen total), short-term study abroad subsidies for students, and subsidies for graduate students to attend academic conferences abroad. Many students and early-career researchers conduct research using this support in addition to public- and private-sector grants and subsidies.



Recent major recipient of the Keio Medical Science Prize	
2020	Dr. Aviv Regev, Genentech Research and Early Development Dr. Atsushi Miyawaki, RIKEN Center for Brain Science / RIKEN Center for Advanced Photonics
2019	Prof. Hans C. Clevers, University Medical Center Utrecht Prof. Tadimitsu Kishimoto, Frontier Research Center, Osaka University
2018	Prof. Feng Zhang, Massachusetts Institute of Technology Prof. Masashi Yanagisawa, WPI-IIIS, University of Tsukuba
2017	Prof. John E. Dick, Department of Molecular Genetics, University of Toronto Prof. Seiji Ogawa, Kansei Fukushi Research Center, Tohoku Fukushi University
2016	Prof. Svante Pääbo, Max Planck Institute for Evolutionary Anthropology Prof. Tasuku Honjo, Kyoto University (Nobel laureate in Physiology or Medicine, 2018)
2015	Prof. Jeffrey I. Gordon, Washington University School of Medicine in St. Louis Prof. Yoshinori Ohsumi, Frontier Research Center, Tokyo Institute of Technology (Nobel laureate in Physiology or Medicine, 2016)




Faculty

<http://faculty.med.keio.ac.jp/en/research/faculty/>




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 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 of 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 Shiomi

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 Yoshiaki Kubota

Affiliation	Anatomy	
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 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.	

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 precisional pathologic diagnosis, quantitative pathologic diagnosis and information technology based pathology.	


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 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.	


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.	

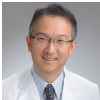
Professor Minoru Ko

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 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 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.	


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 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 Toshiro Sato

Affiliation	The Sakaguchi Laboratory - Department of Organoid Medicine	
Specialized Area	Gastroenterology, Cancer biology, Regenerative medicine	
Research Content	We develop organoid culture protocol for a variety of tissue cells and are study how tissue cell behaviour in a biological context. We particularly focus on applying organoid technology to cancer research and regenerative medicine.	


Professor Hideyuki Saya

Affiliation	Division of Gene Regulation, 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 recurrence of cancer; 3. Analysis of the heterogeneous properties of cancer tissue structure and the plasticity of cancer cells.	

Professor Koichi Fukunaga

Affiliation	Pulmonary Medicine	
Specialized Area	Respiratory medicineInflammatory lung disease (asthma, COPD), Sleep apnea syndrome	
Research Content	Research on the pathophysiology and development of novel treatments of inflammatory lung diseases, especially severe asthma and also screening methods for patients with sleep apnea syndrome and methods for evaluating therapeutic effects.	


Professor Jin Nakahara

Affiliation	Neurology	
Specialized Area	Neurological therapeutics	
Research Content	We aim to develop actual therapeutics by every conceivable means – from advancement of translational research to home care medicine – to improve the quality of life of patients suffering from various neurological diseases.	


(As of May 1, 2021) Refer to entrance examination instructions for an updated list of supervising professors.




Professor Keisuke Kataoka

Affiliation	Hematology	
Specialized Area	Hematology, Molecular oncology, Cancer genetics	
Research Content	Genetic dissection of molecular pathogenesis in human malignancies, particularly in hematologic neoplasms; Establishing clinical relevance of genetic alterations (as therapeutic targets and/or biomarkers); Implementation of precision medicine through clinical sequencing.	


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 assesment and surgical methods. Multicenter collaborative research on spine disorders. Researching spine aging through MRI machines. Researching the invasiveness of spine surgery.	


Professor Tetsuya Tsuji

Affiliation	Rehabilitation Medicine	
Specialized Area	Cancer Rehabilitation Medicine, Angiology, Clinical Neurophysiology, Exercise Physiology	
Research Content	1. Developing cancer rehabilitation programs; 2. Developing a cancer functional assessment set; 3.Development of rehabilitation program for cancer patients in the outpatient setting; 4.Developing therapeutic exercises for cancer cachexia; 5.Developing evaluation methods and therapeutic exercises for lymphedema using fluorescent lymph angiography.	


Professor Yuko Kaneko

Affiliation	Rheumatology	
Specialized Area	Rheumatoid arthritis, Connective tissue diseases	
Research Content	Clinical application of inhibiting inflammatory cytokines to treat patients with rheumatoid arthritis and connective tissue diseases and clarification of the mechanism of their efficacy in relation to the pathogenesis of the diseases.	


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 mehtods 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 Masahiro Toda

Affiliation	Neurosurgery	
Specialized Area	Brain tumors; pituitary tumors; endoscopic skull base surgery; immunotherapy	
Research Content	Development of minimally invasive treatments for brain tumors, pituitary tumors, and skull base tumors (endonasal endoscope surgery, 3D surgical simulation). Development of new treatments for malignant brain tumors (immunotherapy, gene therapy, and cell therapy).	


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 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 Takao Takahashi

Affiliation	Pediatrics	
Specialized Area	Developmental Neurobiology, the Cell Cycle, Neural Stem Cells, Cerebral Cortex Assembly	
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 Hiroyuki Ozawa

Affiliation	Otorhinolaryngology, Head and Neck Surgery	
Specialized Area	Otolaryngology, Head and Neck Surgery; Skull base surgery; Head and Neck Oncology; Minimally invasive head and neck surgery	
Research Content	Development of minimally invasive treatments for head and neck tumors. Developing new treatments targeting recurrent and metastatic head and neck cancer. Research concerning the pathophysiology of rare tumors in head and neck tumors, such as carotid body tumors.	


Professor Masahiro Jinzaki

Affiliation	Diagnostic Radiology	
Specialized Area	Diagnostic Radiology	
Research Content	1. Constructing optimum image diagnostic algorithms in the field ofcardiology and urology. 2. Aiming for further human-body visualization by developing new devicesor techniques (microcirculatory system, lymphatic system, and peripheralnervous system). 3. Assessing clinical application of four-dimensional dynamic imaging.	


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 prevention and therapeutic methods based on analysis of cancer genomes and molecular cytogenesis; and also investigating diagnostic performance of profiles of biomarkers in cancer cells.	


Professor Kazuno Negishi

Affiliation	Ophthalmology	
Specialized Area	Understanding Eyeball Optical System Conditions, Analyzing Visual Performance	
Research Content	Research related to visual optics and function. On the basis of the results of basic optical analysis using PC simulation, optical bench testing, and clinical data, we are trying to improve quality of vision, and aim to construct the ideal optical system for the human eye in daily activities.	


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 Naoyuki Shigematsu


Affiliation	Radiation Oncology	
Specialized Area	Radiation Oncology, Radiation Therapy, Radiation Biology	
Research Content	Radiation oncology; radiation biologyIn 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 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 Taneaki Nakagawa

Affiliation	Dentistry and Oral Surgery	
Specialized Area	Periodontology	
Research Content	1. Research on periodonotopathic bacteria; 2. Resarch 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 Koichi Matsuo

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


Professor Toshiaki Monkawa

Affiliation	Medical Education Center	
Specialized Area	Medical education; Nephrology	
Research Content	Medical pedagogy including the development of education utilizing ICT (Information and Computer Technology), and development of the interprofessional education program. Elucidating mechanisms of water, electrolyte, and acid-base disorders; renal tubule differentiation and regeneration.	


Professor Naoki Hasegawa

Affiliation	Infectious Diseases	
Specialized Area	Clinical Infectious Diseases. Respiratory Infections. Infection Control	
Research Content	Searching for disease mechanisms or biomarkers to evaluate disease activity of respiratory infectious diseases such as pneumococcal pneumonia, pseudomonas aeruginosa pneumonia, influenza, mycobacterial infectious diseases including non-tuberculous mycobacterium and HIV infection. Evaluating the PK-PD evaluation of pulmonary antimicrobial drugs in the lungs by obtaining respiratory tract fluids using bronchoscope. Promotion of PK/PD based appropriate usage of newly-developed antibiotics. Developing, evaluating, and examining the clinical importance of ART in HIV management.	


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 Junichi Sasaki

Affiliation	Emergency and Critical Care Medicine	
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 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 Michito Hirakata

Affiliation	Medical Education Center	
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 Kenzo Soejima

Affiliation	Clinical and Translational Research Center	
Specialized Area	Pulmonary Medicine, Clinical Oncology	
Research Content	Developing new treatment tactics in order to understand and overcome drug resistance through genomic, epigenomic, and proteomic analysis in various forms of long-term exposure molecular targeted treatments of lung cancer and clinical specimens.	


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 the super-magnifying functionality and capsule endoscopes equipped with additional functionality that can achieve pan-enteric surveillance.	


Professor Ryuji Tanosaki

Affiliation	Center for Transfusion Medicine and Cell Therapy	
Specialized Area	Hematology-oncology and cell therapy, in particular hematopoietic stem cell transplantation and transfusion medicine	
Research Content	Transfusion medicine and cell therapy, in particular allogeneic hematopoietic stem cell transplantation for malignant lymphoma, including adult T-cell leukemia/lymphoma. Cell processing center management.	

Professor Kazuki Sato


Affiliation	Institute for Integrated Sports Medicine	
Specialized Area	Sport Related Injuries and Disorders in Upper Extremity, Hand and Elbow Surgery, General Orthopaedic Surgery	
Research Content	1. Biomechanics Biomechanics of the elbow in the throwing athlete; 2. Effects of adipose-derived mesenchymal stem/stromal cell line on enthesopathy; 3. Peripheral Nerve Peripheral nerve regeneration with stem cells purified from neural crest-like cells, derived from human induced pluripotent stem cells.	

Professor Yasue Mitsukura

Affiliation	Faculty of Science and Technology - Department of System Design Engineering	
Specialized Area	Research keywords: Biological signal analysis, adaptive machine learning, EEG/electrocardiographic analysis, emotion analysis, mathematical modeling	
Research Content	We focus on noise removal and data cleansing/feature extraction for datasets, construction of mathematical models, construction of automatic generation algorithms for optimal machine learning methods, and quantification of qualitative words such as emotions and pain.	

List of Master's Program professors


Professor Takahisa Mitsui

Affiliation	Physics	
Specialized Area	Optical Measurements of Soft Matter	
Research Content	Thermal agitation of the interior and surface of matter. Through these measurements, we can gain knowledge not only concerning thermal fluctuation, but moisture and elasticity can also be measured without physical contact. Pursuing clinical applications through performing measurements of various materials.	


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 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 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".	

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).	

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.	



Master's Program

I decided to enter the master's program at the Graduate School of Medicine because of its world-class research and impressive faculty. The lectures taught me about a diverse range of medical fields, which helped me, coming from a non-medical undergraduate background, understand what medical research is all about. It was also a valuable experience to hear the candid opinions of many different doctors on how to act and what to consider as we face this continuing global pandemic. As a researcher here, you're able to broaden your horizons on a daily basis through interactions with a variety of experts, and you can really concentrate on your research. Watching my professors and senior researchers at work, I've seen first hand how solving problems at hand, one by one, can lead to big discoveries. By immersing myself in research at the graduate level, I can fully commit to tackling important issues and experience the process of building a project from the ground up, which is a great source of inspiration for me.



2nd Year Master's Student
Yoshiko Hatano
The Sakaguchi Laboratory-Department of Organoid Medicine



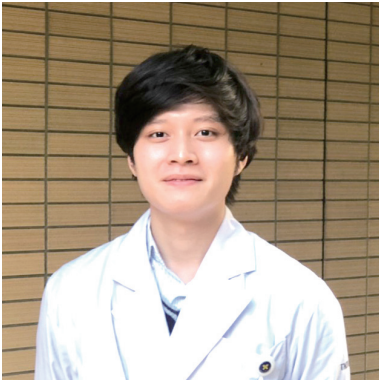
4th Year PhD Student
Tsubasa Saeki
Department of Physiology

PhD Program

I entered the doctoral program at the Keio University Graduate School of Medicine because I was interested in research on development and regeneration of the inner ear, and I am currently working at the Department of Physiology to analyze the pathology of hereditary deafness and search for therapeutic agents using human iPS cells. The Graduate School of Medicine offers a full range of scholarships, from internal scholarships to external research grants, providing an environment where graduate students can focus on their research. At lab meetings, there are plenty of opportunities to engage in discussions with experienced and diverse academic faculty and staff. I often find myself incorporating the opinions, suggestions, and comments they share into my own research. Students are also free to participate in highly informative seminars organized by the various labs across the school. There are still no standard treatments for hearing loss. I hope to use the skills and knowledge I have acquired in graduate school to conduct research that will lead to the development of therapeutic drugs for those with hearing disabilities.

International Student in the PhD Program

The Graduate School of Medicine Keio University provides the students not only opportunities to conduct experiments with well-equipped facilities and cutting-edge technologies, they can also receive constructive guidance and feedback from the teaching staff while conducting one's own research. Especially, as I am aiming to become the Physician-Scientist in the future, many ongoing translational research here has made Keio the ideal place to study as a graduate student. There are also many scholarships and research grants programs which are very helpful for continuing and advancing the research. Moreover, the courses here cover not only basic research, but also include clinical and public health. Most of the classes are conducted in English so there is no barrier for the international students to understand and ask questions. Finally, since there are also many seminars where the top scientists in each field are invited as a guest speaker, I can always update my basic knowledge and advances of technologies in medical research.



2nd Year PhD Student
Sopak Supakul
Department of Physiology



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 Research Encouragement Scholarship	Highly motivated 1st year Master's students showing great research promise.	JPY 300,000, JPY 500,000, JPY 700,000 (Determined by examination)	April
Keio Graduate School Scholarship (For privately financed international students)	International students of master's and doctoral course who have high motivation for academic achievement, an excellent academic record, good character, and financial difficulty in paying study-related expenses. (Status of residence must be "student")	JPY 500,000	September or October
Shinzo Koizumi Foundation Scholarship	Graduate school 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	January or February
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 1,000,000	June or 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	October or November
Keio Medical Otsuka Fumon / Fusako Fellowship	To develop future leaders of medicine in Japan.	PhD students with excellent character and academic performance.	Maximum: JPY 1,000,000	October or 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 Internaional 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, 2021, number of female graduates indicated in parentheses]

1994 - 2020 Total*	Master's Degree	374 (195)
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*The Master's Program was established in 1994

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Degrees	19 (11)	17 (11)	16 (9)	15 (11)	24 (12)	13 (4)	6 (3)	17 (7)	14 (6)	8 (5)	11 (6)

PhD Degrees Awarded [As of April 1, 2021, () indicates number of women in the total]

1952 - 1991 Total	Doctor of Medical Science	2,257 (140)
1991 - 2020 Total	PhD in Medicine	3,167 (628)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Degrees	101 (23)	83 (15)	131 (27)	101 (24)	111 (26)	117 (33)	119 (30)	113 (41)	124 (37)	124 (28)	148 (37)

Tuition and Fees (2021)

Master's	Registration Fee	Tuition Fee	Other Fees	Total First-Year Fees
	JPY 60,000	JPY 1,350,000	JPY 2,600	JPY 1,412,600

PhD	Registration Fee	Tuition Fee	Other Fees	Total First-Year Fees
	JPY 60,000	JPY 1,110,000	JPY 2,600	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: kshina-admission@adst.keio.ac.jp

【TRAIN】 JR Chuo/Sobu Line (1 minute walk from Shinanomachi Station)

