The image is a composite background for a guide book cover. The top half features a majestic, snow-capped Mount Fuji under a clear blue sky with light clouds. The bottom half shows a vibrant university campus with large, leafy green trees in the foreground and a paved walkway where several people are walking. In the background, there are university buildings and more greenery. The text is centered over the image.

UNIVERSITY OF  
YAMANASHI  
GUIDE BOOK

# Welcome to Yamanashi!

-Show various facial expressions-

World Cultural Heritage "Mt. Fuji"  
- Subject of faith and the source of art -



Scenic landscape



Symbol of Sengoku period  
"Takeda Shingen"



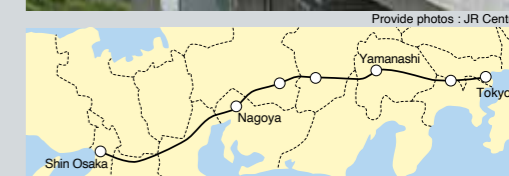
Unique culture etc.



Fruit Kingdom!



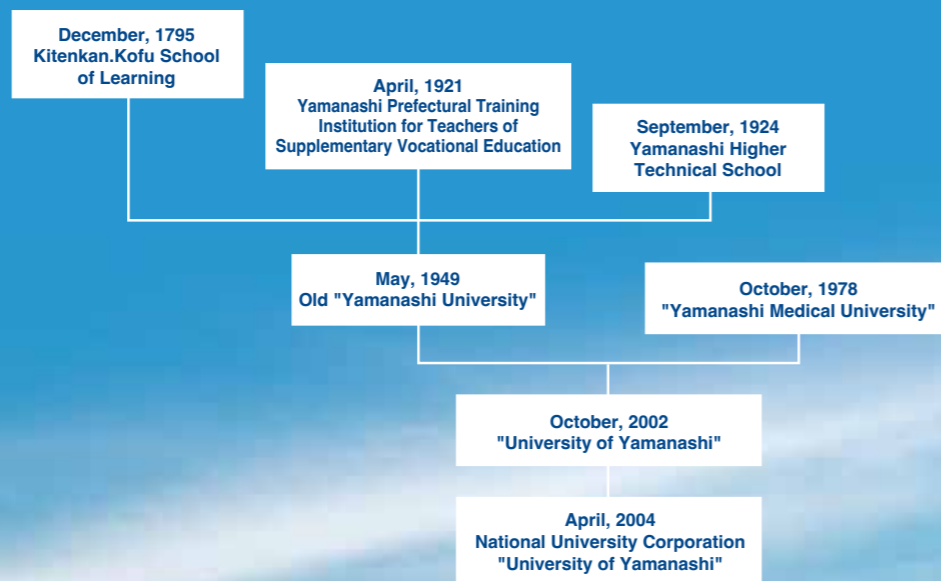
Producing area of Japanese wine!



The Linear Chuo Shinkansen  
Under construction



NAKAMURA Kazuhiko  
President, University of Yamanashi



# Satoshi Ōmura Museum

A new, dynamic forum for academics, culture, and art

Dr. Satoshi Ōmura, a 1958 graduate of the University of Yamanashi's Faculty of Liberal Arts and Sciences (now the Faculty of Education) won the Nobel Prize in Physiology or Medicine in December 2015.

In commemoration of that monumental achievement, the University of Yamanashi created the Satoshi Ōmura Memorial Scholarship Fund and established the Satoshi Ōmura Museum to honor Dr. Ōmura's tremendous accomplishments and preserve his legacy for future generations.

The entrance to the Satoshi Ōmura Museum, which abuts Takeda-dōri on its way to Takeda Shrine, features a unique, compelling design that invokes the octagonal, three-story structure of the second Kitenkan—a branch of the Shōheikō (a state-run school under the Edo shogunate) that would later go on to become the Faculty of Education at the University of Yamanashi.

The first floor of the museum houses several exhibit areas, showcasing not only a variety of valuable items relating to Dr. Ōmura's Nobel Prize and academic triumphs but also a wealth of academic items and cultural pieces that offer revealing glimpses into the University of Yamanashi's storied past. On the second floor, meanwhile, is Ōmura Hall: a space available to students, faculty, alumni, and the local community.

The University of Yamanashi is a "Center of Community," a backbone institution for the entire region. That symbolic identity has taken on a deeper, richer significance with the creation of the Ōmura Museum, which represents a core hub for the community on a far-reaching scale, nurtures and showcases academic, cultural, and artistic endeavors, and symbolizes a new chapter in the history of the University of Yamanashi.

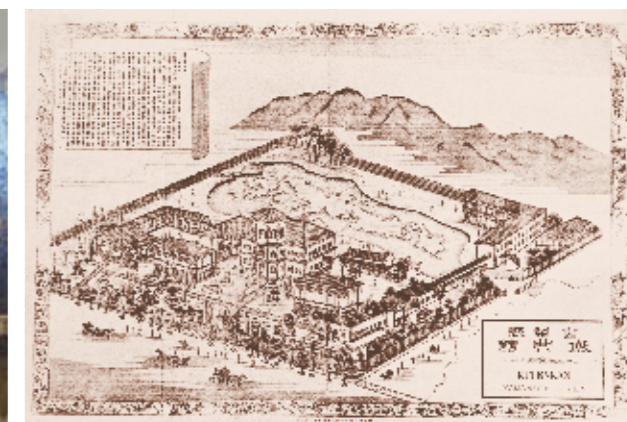


## Dr. Ōmura exhibit

This collection delves into Dr. Ōmura's remarkable life and career, featuring photographs, original copies of graduation papers, examples of numerous research projects, and a wealth of items that cast an illuminating light on his Nobel Prize triumph.

## Kitenkan exhibit

Visit this exhibit for a peek into the Kitenkan, the Shōheikō (Edo shogunate-run institution) branch school that would develop into the University of Yamanashi. In this exhibition area, museum-goers will find fascinating archival evidence from the late-eighteenth-century onward, the Kitenkan monument, an ink impression of the institution's motto, and more.





# Clean Energy Research & Research on Fuel Cell Nanomaterials

Energy issues represent one of the biggest crises currently confronting humanity. Considering the pressing need for solutions to those problems, the demand for rapid, drastic improvements in technologies for the conversion and storage of “green energy”—a core component of Japan’s national growth strategy—is strong.

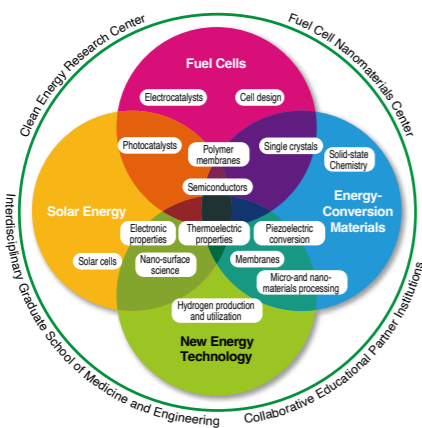
The University of Yamanashi is striving to be a global hub for advances in clean energy. By creating world-class research facilities and developing a host of graduate-education programs (see below), the University is propelling its education and research activities forward through a unique educational structure, a distinctive curriculum, and close ties with industry, government, and academics.

## Special Doctoral Program for Green Energy Conversion Science and Technology (graduate school)

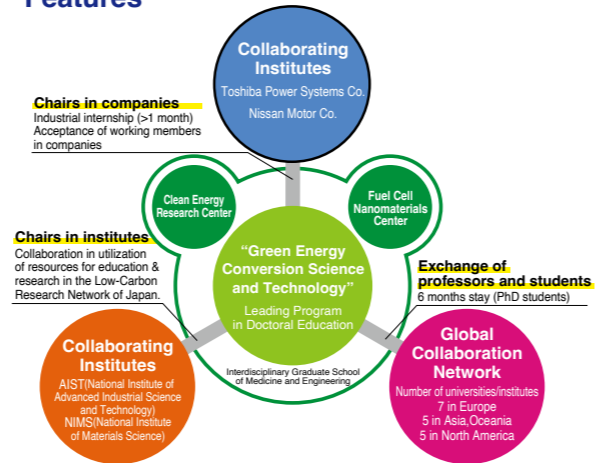
The purpose of this program is to nurture leaders who can make green innovation happen in a global setting, drawing on a broad perspective in energy conversion science and technology and its economic aspects. The program uses an educational approach with a vision shared by industry, government, and academics.

The program has three core focus areas: developing innovative technologies for the efficient, economical conversion and storage of green energy in hopes of realizing a low-carbon, sustainable society, achieving an optimal balance of energy-conversion devices, and using findings to pave the way toward green innovation. Through an instructional approach that integrates basic and practical studies, the program aims to develop global leaders capable of making an important impact in those key areas.

These issues can be divided into the following four fields (please refer to the diagram)

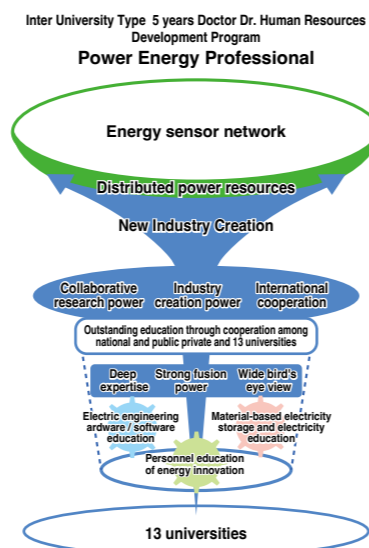


## Features



## Power Energy Professional Training Program (Doctoral Program for World-leading Innovative & Smart Education)

The Power Energy Professional (PEP) Training Program is a five-year doctoral program for cultivating “knowledgeable professionals” with the abilities to lead a variety of sectors in the creation of new industries by optimizing the energy-value chain, a core element of Society 5.0. Selected as a “Doctoral Program for World-leading Innovative & Smart Education” by the Ministry of Education, Culture, Sports, Science and Technology, the PEP Training Program embodies the Ministry’s vision of establishing organizational links with external partners—elite universities, private businesses, and other institutions around the world—to create a hub of world-class education and research. The University of Yamanashi will continue to develop doctoral human resources with advanced expertise for creating new industries in the power and energy sectors and work to lay a solid foundation for the sustainable development of skilled professionals, meaningful exchange, and new collaborative research.



Aspiring to be a center of research and human-resource development for Japan’s green-energy sector !

## Clean Energy Research Center

The Clean Energy Research Center at the University of Yamanashi, comprising the Division of Fuel Cell Research, the Division of Solar Energy Conversion Research, and the Division of Energy Measurement Research, promotes research on clean energy (areas such as fuel cells, hydrogen production, CO<sub>2</sub> fixation, and analytical investigation) harvesting in hopes of contributing to solutions to issues concerning energy and the global environment. By providing undergraduates and graduate students with direct educational and research-oriented guidance, the Center balances its research initiatives with a commitment to transforming learners into motivated, capable human resources in the relevant specializations.



## Hydrogen and Fuel Cell Nanomaterials Center

In hopes of laying the groundwork for “hydrogen society” through full-scale utilization of fuel-cell technology, Hydrogen and Fuel Cell Nanomaterials Center draws on a team of expert researchers—from around the world and across the industrial spectrum—and a host of world-class, cutting-edge evaluation and analysis facilities to tackle national initiatives, joint-research projects with the industrial sphere, and graduate-level education. That diverse scope of engagement is a core feature of the Center, which strives to produce research with both progressive and practical dimensions and provide the researchers and engineers with the hands-on training they need to be driving forces in the fields of hydrogen and fuel-cell technology.





# Special Graduate Programs on River Basin Environmental Sciences

The Interdisciplinary Centre for River Basin Environment (ICRE) fosters young experts who can understand the diversity of given regions and communities, identify area-specific environmental and water issues, and implement practical solutions. Together, we engage in flood and drought risk analyses, the conservation and relocation of water resources, the identification of pollution sources and processes, the development of locally fitted treatments for drinking and wastewater, the evaluation of health socioeconomic impacts, and more.



## Diploma policy

To fulfill these missions, the graduate programs aim to enhance students' integrity to:

- "Understand diversity" of climate, culture and development levels for creating plan and methodology fitting to the regionality.
- Use "wide knowledge" on river basin environmental issues: analysis and visualization of data, planning and wellbeing, basics of hydrology/water chemistry/microbiology/environmental technologies.
- "Independently" conduct the plan-do-check cycle based on sustainable development.
- "Collect and disseminate information" for application and development of own speciality to different fields.
- "Build consensus" among stakeholders through negotiation.



## Links between world-class water sciences and education

- Students gain a trans-boundary knowledge of hydrology, quality, microbiology, sanitary engineering, planning, and medicine from experts of environmental sciences.
- Students develop collaborative skills through placements (practicum), fieldworks and the "International Exchange Program".
- The alumni network, Science Union for river basin Researches and Friends (SURF), support students and researchers to pursue their studies in different environments collaborative projects.



## Establishing an international standard

- "Multiple Supervisor" and careful, thorough guidance through "Closed Discussions" every semester
- Flexible connections between master's and doctoral courses
- A rigorous evaluation system for degree assessment (mid-term assessment and final defense)
- A multi-nationality environment (students from 20 countries, international co-supervision, and coursework in English)
- Support for student life (cross-cultural events, career guidance for international students, scholarships, travel support, and more)

## Scholarship

- Japanese Government (MEXT) Scholarship for master's course
- Support for tuition fee from our course (ICRE)
- Research assistant fee for doctoral student from our university
- Partial scholarship for doctor students from our university

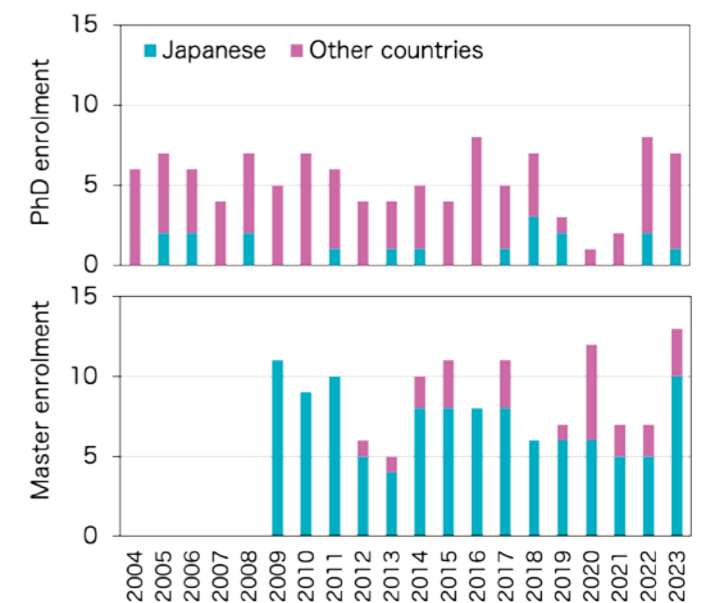


## Career paths

- Private-sector fields like environmental consulting, survey work, analysis, plant planning and construction, and informatics
- Government
- Academic institutions
- Environmental NGOs



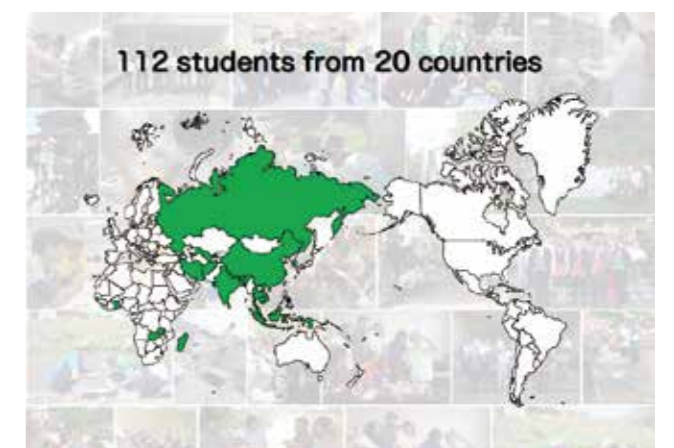
## Enrollment statistics

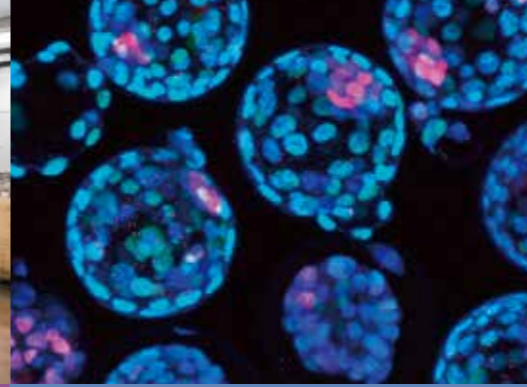


## History

- 2003-2007 Selected for the 21st Century COE Program by the Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- 2004 International Special Doctoral Course for Integrated River Basin Management established
- 2006-2011 Selected as a Priority Graduate Program (PGP) for doctoral education by MEXT
- 2007 ICRE established
- 2008-2012 Selected as a Global COE by MEXT
- 2009 International Special Master's Program on River Basin Environmental Science established
- 2014-2018 Selected as a PGP for doctoral education by MEXT
- 2014-2018 Science and Technology Research Partnership for Sustainable Development (SATREPS) Project in Nepal implemented by JICA/JST
- 2016 Integrated Graduate Program established

## Network: More than 80 PhD alumni



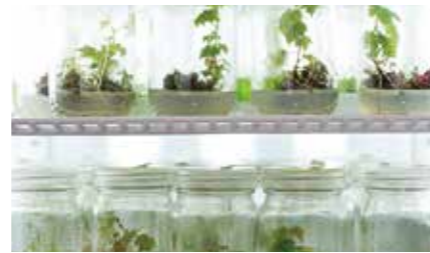


## Wine Science

## Advanced Biotechnology



The Institute of Enology and Viticulture was founded in 1947, as the unique research institute specializing in wine and wine grape in Japan. The Institute has long contributed to research and education related to wine and wine grapes. It plays a central role in wine science and strives to develop the wine industry in Japan.



### Education

The faculty members of the Institute of Enology and Viticulture belong to the Graduate Faculty of Interdisciplinary Research. They are in charge of the graduate and doctoral courses and act as advisers to students in their research work. At the undergraduate level, they handle general education subjects, experiments on winemaking, as well as basic and specialized subjects for students of the Faculty of Life and Environmental Sciences. They also supervise the students' undergraduate theses.

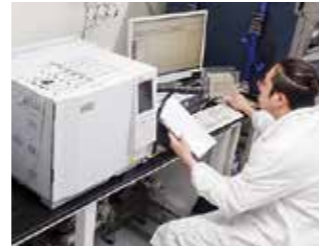
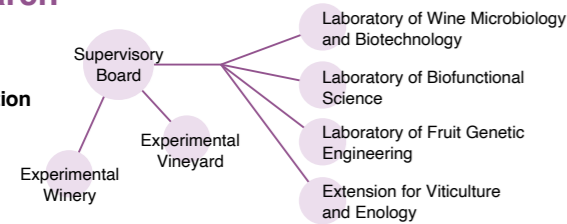
Today, many of the graduates are actively involved in fields related to grapes, wine, and food.

The institute also runs a unique vocational education system called the "Wine Frontier Leader Education Program". It is an authentic vocational education program designed to train graduate students and technical experts to become wine specialists.

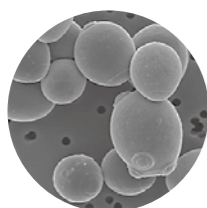


### Research

#### Organization



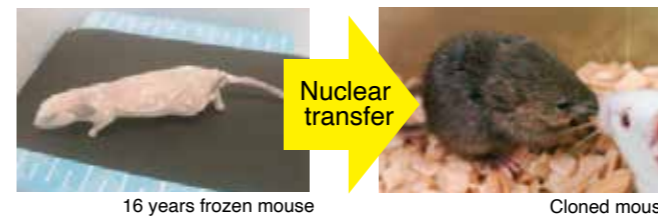
We have also joined the Oenoviti International Network, a network of educational and research institutions around the world involved in wine science, and we are actively participating in educational and research activities from a global perspective.



At the Advanced Biotechnology Center (ABC), we conduct a variety of "unique" experiments—investigations that some might associate with the realm of science fiction. For example, we are trying to generate offspring from extinct animals via cloning, exploring the possibilities of freeze-dried (instant) sperm, and using the International Space Station (ISS) to investigate reproductive biology. One of the only research centers of its kind in the world, the ABC also boasts a unique array of 17 micromanipulators for experimentation.

### Cloned mice from frozen dead cadavers preserved for 16 years

One of our landmark achievements was the creation of healthy cloned mice "resurrected" from dead mice that had been frozen for 16 years. This achievement led to widespread speculation that resurrecting the woolly mammoth and creating a real-life "Jurassic Park" might no longer be very far off.



### Cloned mice from urine-derived cells

Endangered species are still alive, but collecting donor cells from the species without injuring the corresponding body is a significant challenge. Using urine-derived cell nuclei, we can generate clones non-invasively.



Cloned mice from urine

### Study for mammalian space reproduction

The environment in space is vastly different from that on Earth, with its high levels of space radiation and microgravity. The effects of these factors on mammalian reproduction are largely unknown. We are studying those effects through experimentation on the ISS.

-Space Pup Project: To investigate the effects of space radiation, freeze-dried sperm are launched to the ISS and will preserve there for up to 6 years. The first space pups derived from space preserved sperm on the ISS for 9 months were born without any mutations.

-Space Embryo Project: To investigate the effects of microgravity, mouse embryos will be launched to the ISS and cultured by astronauts in a zero-gravity environment.



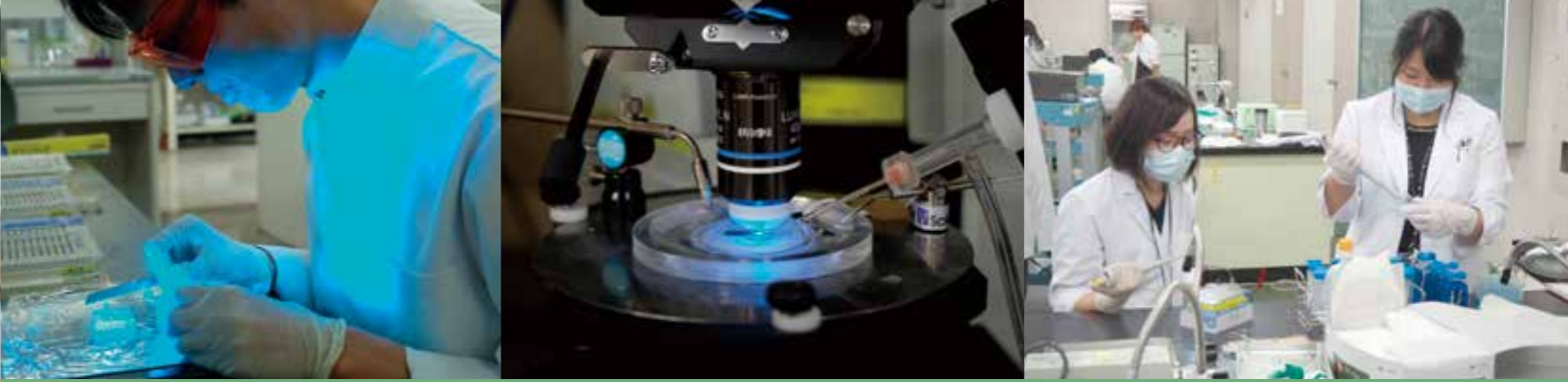
First space pup

One of the ABC's distinctive features is its collection of micromanipulators. Not only is the array large in number, but the equipment is highly specialized and configured for mammalian embryo manipulation—a process that will enable experiments that have never been tried or even dreamed of.

Another important aim of the ABC is to foster researchers for future generations through its research activities.

For students with an interest in pursuing these kinds of experiments and learning micromanipulation techniques, the ABC is the best place in the world.





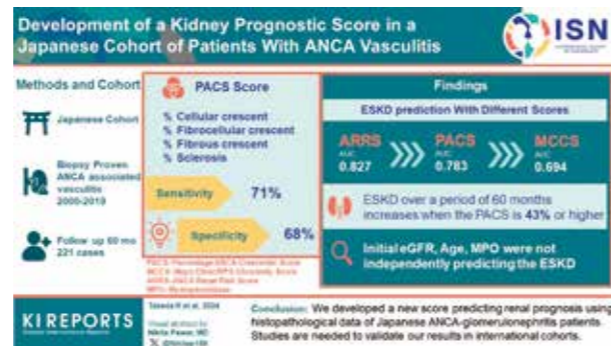
## Recent Key Topics in Medical Research & Education

## Advanced Brain Science

### RESEARCH

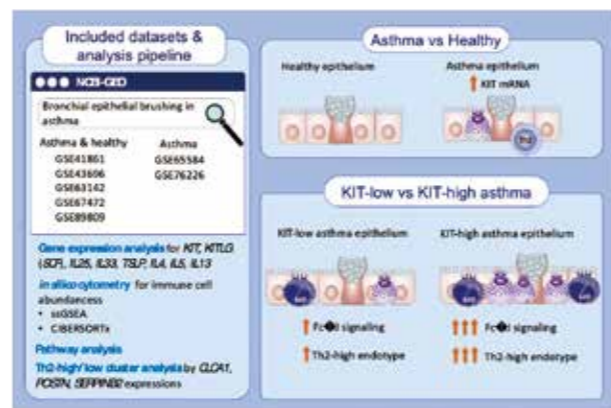
- **Advanced Brain Science (see page 13)**
- **Development of a Kidney Prognostic Score**

Glomerulonephritis is frequent in antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) and crucial to disease outcomes. We conducted a detailed assessment of renal pathology in Japanese patients with AAV, and developed a new score that would predict renal outcome. Two hundred twenty-one patients who were diagnosed with AAV and underwent a kidney biopsy were enrolled. Data on glomerular, tubular, interstitial, and vascular lesions from kidney biopsies were analyzed. Based on our findings, we created a score evaluating the percentage of these lesions to total glomeruli, the Percentage of ANCA Crescentic Score (PACS) (from the Department of Rheumatology, Kidney Int Rep. 2024 Jan).



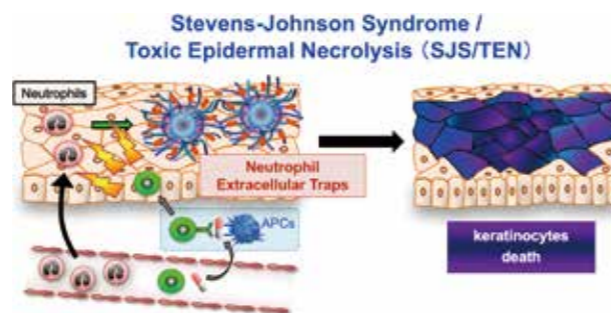
- **Potential reason why asthma is difficult to treat**

Asthma is an airway inflammatory disease that can make breathing difficult and interfere with daily activities and may become life-threatening, which affects ~300 million people worldwide. A comprehensive bioinformatic study using 7 public gene expression datasets from airway samples of asthma and normal subjects found that one of the immune cells called mast cells were abundantly present and persistently activated in asthmatic airways regardless of treatment. Thus, mast cells may be an important therapeutic target in asthma (from the Department of Immunology, Allergy 2023 Nov 20).



- **How to develop life-threatening mucocutaneous adverse drug reactions?**

Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are life-threatening mucocutaneous adverse drug reactions characterized by extensive epidermal detachment. While cytotoxic T cells and their associated effector molecules have been recognized to drive SJS/TEN pathophysiology, the contribution of innate immune responses had not been well-understood. Researchers in the Department of Dermatology revealed neutrophils triggered inflammation during early phases of SJS/TEN. Neutrophils induce epidermis to necroptosis and contribute to the progression of SJS/TEN by forming neutrophil extracellular traps (NETs) (Science Translational Medicine, 2021; an electron microscopy snapshot was featured on the cover).



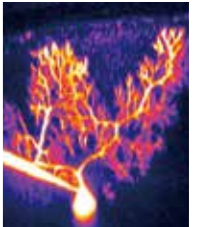
### EDUCATION

- **Special Program to Foster Physician Scientists: "Life Science Course"**

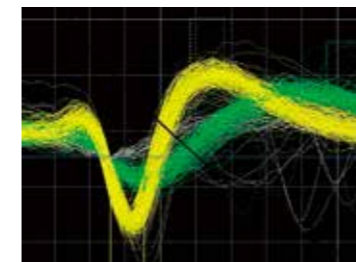
This unique course is designed for undergraduate students with a strong desire to become physician-scientists and advance the practice of medicine. This course is an educational program designed to equip students with core research knowledge and skills, logical thinking skills, and excellent presentation techniques.



This special graduate program in the Division of Medicine aims to train (1) basic researchers with full mastery of various techniques and research activities in brain science, (2) researchers and educators specialized in developmental brain science with broad backgrounds in social medicine and education, and (3) interdisciplinary scientists who would be expected to work for the realization of healthy life and longevity, especially being aware of issues of the aging population and those specific to Yamanashi, such as neuropsychiatric disorders.



### Top-level neuroscience research and multidisciplinary training program



The program consists of labs in various disciplines, including biochemistry, neurophysiology, systems neuroscience, neuropharmacology, immunology, systems biology, structural biology, social medicine, neurology, neurosurgery, neuropsychiatry, and neurourology. Students have the opportunity to cover a wide range of different specialties in neuroscience and learn skills in various disciplines. The Principal Investigators have a worldwide network of personal contacts in their respective fields, allowing students to interact with foreign researchers from different fields. Each year, we hold an international conference to which we invite outstanding researchers from around the world. By attending this conference, students

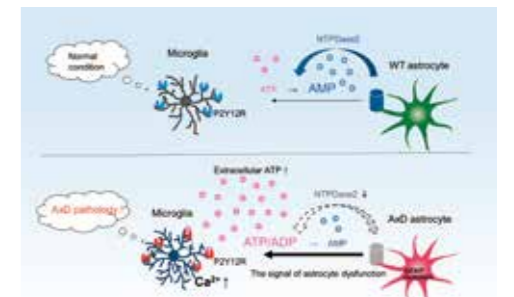


are exposed to cutting-edge brain research and can hone their scientific discussion skills. Enrolled graduate students can take lab rotations, visiting several labs to learn new skills in experimental neuroscience, such as fluorescence/electron microscopy and electrophysiology. We also offer an interdisciplinary neuroscience lecture course taught by experts from the above labs and related fields. Through this program, students gain insight into how to integrate different types of knowledge to generate novel ideas.

### Research topics

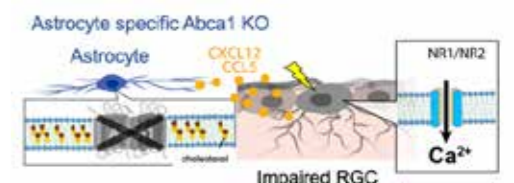
- **Microglia sense astrocyte dysfunction and protect a neurological disease**

Alexander disease is a neurological disorder caused by mutations in the astrocyte-specific gene GFAP, also known as primary astrocyte disease. A study from the Department of Neuropharmacology focused on microglia, another type of glial cell, and showed that microglia are actively involved in the pathogenesis of Alexander disease. Studies using a mouse model suggested that microglia sense the elevated extracellular ATP produced by astrocytic pathology in model mice as a pathological signal via the P2Y12 receptor and suppress astrocyte pathology. Microglia were found to have important disease-modifying effects on Alexander disease, the primary astrocytic disease. The study can be expected to contribute to the development of future therapies based on microglial manipulation (Brain, 2024 Feb).



- **Glial dysfunction triggers eye disease**

Glaucoma is the leading cause of blindness in Japan. While elevated intraocular pressure (IOP) has been thought to be the main cause, most Japanese glaucoma patients have normal IOP levels. This led us to explore other factors contributing to the disease. Our recent study revealed that dysfunction in glial cells is responsible for normal-tension glaucoma. Glia are non-neuronal cells found in the nervous system, such as the brain and retina. Specifically, astrocytes, a type of glial cell, can trigger normal-tension glaucoma by causing inflammation and excessive nerve activity when the cholesterol exporter ABCA1 is absent in the cell (from the Department of Neuropharmacology, Science Advances, 2022 Nov).



# University of Yamanashi Hospital

Advanced medical care and cutting-edge technologies



## 1. Operating room with intraoperative MRI technology for Neurosurgery

Intraoperative mobile 3-tesla MRI scanner advances surgical safety and reliability to a new level. This mobile MRI scanner is usually stored in the neighboring room and is moving toward the patient in the operating suite via ceiling-mounted rails. Intraoperative MRI plays a pivotal role in the brain tumor resection by confirming surgical information including brain shift and residual tumor while the patient is undergoing surgery. Higher quality resolution of 3-tesla MRI can also improve the resection rate since it provides precise tractography and MR spectroscopy.



## 2. Robot-Assisted Laparoscopic Surgery

- 1) Urology: Prostate cancer, Kidney cancer, Urinary bladder cancer
- 2) Digestive Surgery: Gastric cancer, Colo-rectal cancer, Esophageal cancer
- 3) General Thoracic Surgery: Lung cancer, and mediastinal cancer
- 4) Gynecological Surgery: Uterine cancer

### da Vinci®: A sophisticated robotic system for assisted-endoscopic surgery

The da Vinci system, a robotic apparatus, features an arm for holding 3D camera and 3 interactive arms capable of holding forceps, scissors, bovies and scalpels. Using the da Vinci® system, doctors can perform meticulous, high-precision surgeries —many of which would be unfeasible under traditional laparoscopic approaches—in a safe, and smooth fashion. In 2013, daVinci® Si was introduced into our hospital first in Yamanashi Prefecture, and new type daVinci® Xi and X were introduced in our hospital in 2019. From 2018, more than 10 types of surgeries (prostate cancer, partial nephrectomy for kidney cancer, radical cystectomy for urinary bladder cancer, total gastrectomy and partial gastrectomy for gastric cancer, rectal cancer, lung cancer, mediastinal tumor resection, uterine cancer and so on) have been performed.



daVinci Xi®

Patient cart of daVinci® Xi with 48mm-diameter arms

daVinci® X

## 3. Cardiovascular Surgery

### TAVI (Transarterial Aortic Valve Implantation) in Hybrid Operation Room

Transcatheter valve interventions are rapidly developing as an alternative to surgery for high-risk patients. Hybrid operating rooms (ORs) allow cardiac surgeons and interventional cardiologists to work together to perform minimally invasive procedures such as transcatheter aortic valve implantation (TAVI).

### TAVI: Transcatheter aortic valve implantation

TAVI, a new approach to the treatment of severe aortic stenosis, minimizes physical strain so that many patients who have been unable to tolerate the burden of conventional surgeries can get the vital treatment they need. In 2017, the University of Yamanashi Hospital became the first institution in the prefecture to perform a successful TAVI procedure. Currently, approximately 60 surgeries are performed annually.



Aortic Valve Device for TAVI

The angiography system in the University of Yamanashi's hybrid OR; Artis Zeego® equipped with robotics, not only allows doctors to perform surgical procedures and intravascular treatments simultaneously but also features a multi-joint arm that facilitates operations in complicated surgical positions. Various clinical applications are possible using Hybrid OR, not only TAVI (trans aortic valve implant), but also the followings; endovascular treatment, intraoperative diagnosis, or hybrid surgery for neurovascular diseases including acute cerebral ischemia, atherosclerotic diseases, intracranial aneurysm, arteriovenous malformation, dural arteriovenous fistula, and spinal arteriovenous malformation.



The University of Yamanashi's hybrid OR; Artis Zeego®

## 4. Orthopaedic Surgery: O-arm-navigated spine surgery

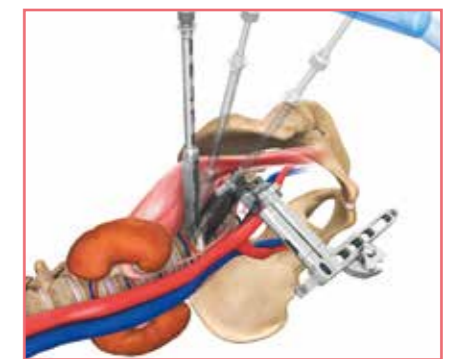
In the University of Yamanashi Hospital, operation room has 2 sets of O-arm® 3D Surgical Imaging System for Spinal Surgery Imaging. Our Hospital is the only one Governmental University Hospital in Japan, equipped with 2 sets of O-arm® System. O-arm® surgical 3D imaging technology allows precise and minimally- invasive procedure during complex spine surgeries. Therefore, our spine team allows those minimally-invasive surgeries in 2 patients (adult or pediatric) with spinal deformity parallelly. The O-arm® system provides guidance during complex spine surgeries and provides the following advantages over C-arm fluoroscopes currently in use. These advantages include:

- 1) The O-arm® can be positioned without moving the patient, the ring-shaped gantry can be both opened and closed.
- 2) Ultra-fast imaging reduces x-ray exposure of patients and staff
- 3) Detailed 3-D surgical site images are available for surgeon viewing in seconds, not minutes. This feature is ideal as surgeons confirm precise placement of hard and may help eliminate need for future revision surgery.



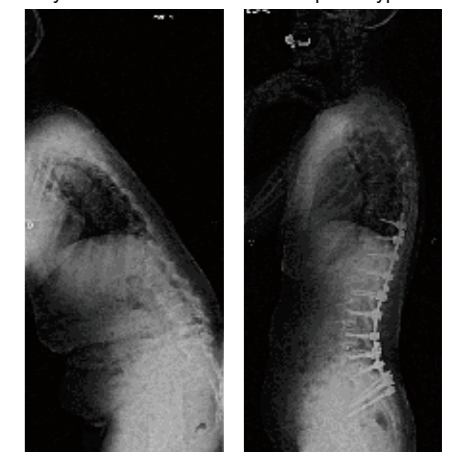
O-arm® 3D Surgical Imaging System

OLIF (Oblique Lateral Interbody Fusion): Novel Minimally-invasive spine surgery



OLIF

70 years old Female with Adult Spinal Kyphosis



Before OLIF

After OLIF



## 5. University of Yamanashi Hospital, Radiation Therapy Center

is a clinically high volume and high precision radiotherapy center in Japan, and a leading research center in concerning advancement and development of new technology and methodology for radiotherapy. The followings are our radiation treatment modalities.

### 1) SBRT, IMRT, and IGRT

SBRT (stereotactic radiation therapy) and IMRT (Intensity-Modulated Radiation Therapy)-applicable Linear accelerator can be provided with Image Guided Radiation Therapy (IGRT) using high-speed on-rail (self-moving) CT, that was developed in our university hospital.



University of Yamanashi Hospital's original Radiation Therapy Apparatus

### 2) The TomoTherapy® System

is among the most revolutionary innovations in the history of cancer treatment, completely redefining the standard for individualized and precise treatment of tumors anywhere in the body — while creating a new paradigm for patient comfort and quality of life. The first truly complete Image-guided radiation therapy (IGRT) and intensity-modulated radiation therapy (IMRT) solution. TomoTherapy combines integrated CT imaging for exceptional treatment accuracy with a first-of-its-kind helical treatment delivery platform that uses patented beam-shaping technology to precisely target tumors while minimizing impact on surrounding healthy tissue. University of Yamanashi Hospital is the 1st Governmental University Hospital, in which The TomoTherapy® System was installed in Japan. Tomotherapy® device delivers excellent therapeutic effects by targeting radiation at specific tumors with pinpoint accuracy and thereby minimizing negative impact on normal tissue.



### 3) Image-guided brachytherapy system

Brachytherapy is an Internal irradiation therapy for cancer. A small capsule with 2mm diameter which seals with Radioisotope is inserted into and around cancer tissue. Brachytherapy can provide directly radiation energy to cancer tissue.

### 4) Proton therapy

Proton therapy is a type of radiation therapy — a treatment that uses high-energy beams to treat tumors. Radiation therapy using X-rays has long been used to treat cancers and noncancerous (benign) tumors. Proton therapy is a newer type of radiation therapy that uses energy from positively charged particles called protons. Proton therapy has shown promise in treating several kinds of cancer.

Studies have suggested that proton therapy may cause fewer side effects than traditional radiation, since doctors can better control where the proton beams deposit their energy. Proton therapy isn't available in the University of Yamanashi Hospital, but in an affiliated hospital.

### 5) Cyber knife®

CyberKnife® radiosurgery, also called stereotactic radiosurgery, is a form of radiation therapy that delivers high-dose radiation on an exact area of the body. CyberKnife® radiosurgery targets and treats tumors in the body with very minimal damage to surrounding healthy tissue, which is the primary cause of cancer treatment side effects. Because of this, it is an excellent alternative to traditional cancer treatments, such as radiation, chemotherapy and surgery. CyberKnife® radiosurgery isn't available in the University of Yamanashi Hospital, but in an affiliated hospital.



## 6. Department of Emergency and Critical Care medicine

The department of Emergency and Critical Care Medicine provides primary emergency care and advanced emergency care (critical care) on a prefecture-wide basis. Ever since the 2011 East-Japan big earthquake and tsunami, the Hospital has also been bolstering its Disaster-medicine capabilities. One of the key components of those efforts is the Hospital's rooftop heliport, which makes it possible to transport emergency patients quickly and meet the needs for Emergency medical care and Disaster medicine more effectively.

The ER (emergency room) provides care to patients with urgent medical conditions carried by an ambulance and takes charge of emergency duty in this area. The department provides care for critically ill patients presenting to the ICU (intensive care unit) with the highest quality. The equipment for artificial organ support including ECMO (extracorporeal membrane oxygenation) is ready to use for patients those who are in life-threatening conditions in the ICU.



## 7. Attached hospital redevelopment project

As the only advanced treatment hospital in Yamanashi Prefecture, the University of Yamanashi Hospital must offer the latest medical care. To enhance advanced medical care and acute patient care, hospital redevelopment projects have been launched.

The new ward stage I building was completed in June 2015 and opened in December of the same year. The main focus of this project was the strengthening of the surgical department and areas that handle emergency/disaster medical care. In the surgical department, an MRI operation room equipped with the first Mobile 3-tesla High-field MRI Scanner in Japan and a Hybrid Operating Room are two of the highlights of the redevelopment project.



Center photo: New ward Stage II building Right photo: New ward Stage I building



New ward Stage II building entrance



Hospitalization Support Center



Negative pressure chamber (Pediatric)



a sterile area where nursing operations can be performed



External appearance of New Ward Stage II



RI hospital room



playroom



Special room

### ■Completion of new ward (stage II)

Construction was started on the new Ward II building in October 2018, and was completed in June 2020. After a period of preparation, the hospital opened in October 2020. There are six special features of the stage II building: on the first floor near the front entrance, a new admission and discharge support center has been added; a negative pressure room with a separate flow line is now on each floor; an RI room is on the second floor; an in-hospital class and play room is on the fourth floor, a sterile area where nursing operations can be performed is on the seventh floor, and special large rooms about the size of four hospital beds have been added.

### ■We will proceed with the redevelopment plan with the aim of further enhancing hospital functions.

We are proceeding with renovation work on existing facilities such as the administration department (New Ward III Stage Wing), the central medical ward, and the special medical ward. Our goal is to build an infrastructure that allows hospital management to run smoothly.

## Active International Students! (Interviews in 2024.2)



**MUHAMAD IRFAN BIN AB MANAF**  
(From Malaysia)

Graduate School of Education Master of Education's Course (1st Year)

The allure of Japan's esteemed music education led me to the University of Yamanashi, where a transformative journey unfolded. I am a research student under Teacher Training Program. I am deeply grateful for the scholarship from MEXT, which made this journey possible. Studying amidst the serene landscapes of Yamanashi, I realized that my academic pursuits were not just about acquiring knowledge but about

fostering a deeper understanding of diverse musical traditions and pedagogical methods. Through the corridors of the university, I traversed the realms of theory and practice, delving into the intricacies of comparative music education. As I navigate the complexities of my chosen field, I remain steadfast in my commitment to promoting cultural understanding and global harmony through music. But my journey was not confined to the confines of academia. In the vibrant tapestry of university life, by joining activities organized by center for Promotion of Internationalization and G-Philos, I found myself engaging in cross-cultural dialogues, forging meaningful connections with fellow students from around the globe. I found joy in joining the English Café. I have made a lot of new friends. Together, we explored the rich tapestry of Japanese culture, exchanged musical insights, and collaborated on projects that transcended linguistic and cultural barriers. In the corridors of the University of Yamanashi, I am not just a student, but a seeker of knowledge, a champion of diversity, and a believer in the unifying power of music. As I reflect on my journey, I am filled with gratitude for Ms. KOJIMA Chika's guidance, the University of Yamanashi, and the MEXT scholarship program. My experiences epitomize the transformative power of education in fostering a harmonious and interconnected world, where music serves as a universal language that transcends borders and unites hearts and minds in celebration of our shared humanity.



**RICARDO CERRUD** (From Panama)

Integrated Graduate School – Doctor's Course (1st Year)  
Systems Integration Engineering Course

Since I was a child, one of my dreams was to study in Japan, as I have always admired the technology developed here. After finishing my bachelor's degree, the Japanese embassy in Panama opened a call for master's and doctorate scholarships in Japan. I applied for this scholarship, passed all the interviews and exams, and was among the lucky few

selected through the Ministry of Education, Culture, Sports, Science and Technology (MEXT) to receive the scholarship and study in Japan. I was very eager to study robotics and automation, one of my dreams, and I wanted to apply those technologies to agriculture, as it is an area that I have always felt needed new solutions. For these reasons, I applied to the University of Yamanashi because I admired their dedication to agricultural studies. With the help of my supervisor, I began to conduct research on the use of mechatronics in agriculture, specifically studying cherries. I completed my master's degree in mechatronics engineering, and I am currently enrolled in the Systems Integration course. Along the way, I have had the opportunity to acquire new knowledge through amazing professors, as well as learn more about Japan, its language, its culture, and enjoy my stay as an international student thanks to the support that the University has given me. I also joined G-Philos 2 years ago, where I have been able to chat with many international students from all over the world, as well as with extraordinary Japanese students. I have been able to make new friends, try and discover new things, and I am very grateful for this. It has truly been an amazing journey, one that I savored every step of the way. I can confidently say it was worth everything, as it has led me to invaluable experiences and growth.

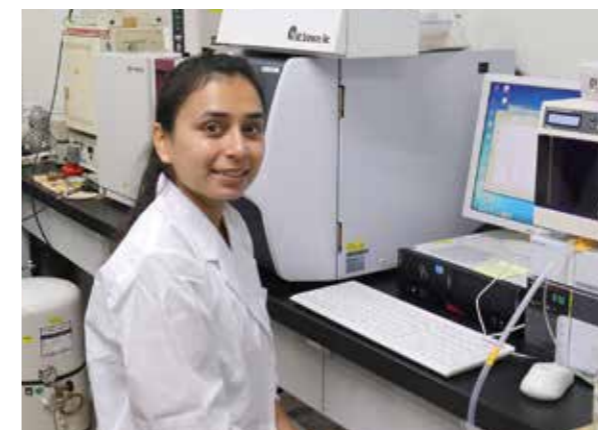


**TAHARIMA TABASSUM** (From Bangladesh)

Integrated Graduate School – Doctor's Course (2nd Year) Medicine

When I was graduated as a doctor (MBBS), I enrolled in MPH (Department of Non-communicable Diseases) program to evaluate the prevalence of depression among elderly people of Bangladesh. Since then, I have started loving research, and have become increasingly interested in the molecular mechanisms underlying depression. Unfortunately, my country lacks the resources and data necessary to understand

the molecular pathophysiology of depression, so I began planning to move abroad to pursue my education. Eventually I applied for scholarships in overseas, and I got selected for Monbukagakusho scholarship in Japan in 2021. I chose the PhD program in Neuropsychiatry department to quench my inquisitiveness about depression under MEXT scholarship. I joined Dr. ISHIGURO Hiroki's group, he has been studying the endo-cannabinoid system in genetically knocked-out mice for around twenty years. We are currently conducting an experiment on C57BL/6 mice, we examine the alcohol consumption rate of CB2 knock-out mice after administration of specified amount of stress. We want to establish CB2 receptor involves in addiction behavior. However, aside from studying, I adore every season in Japan. I've been a nature enthusiast since I was a child, and I created a small garden on the balcony of my dormitory to relieve stress. I've started learning Japanese so that I can converse more effectively. Before visiting Japan, I was apprehensive about the language barrier, but the hospitality of the locals quickly dispelled my concerns. Because of Japan's strict time management, I've never missed a train despite not understanding the Kanji. Once I lost my wallet, I forgot where I had left it. Two days later, I inquired one of the convenient stores I had lately visited, and they safely returned my wallet. That day, I truly realized the myth of honesty of Japan. Finally, I still believe this is the ideal place for me to study and live, and I intend to stay in Japan after graduation.



**ADITI SRIVASTAVA** (From India)

Integrated Graduate School – Master course (1st year)  
Life and Environmental Sciences

My previous field of study was Sociology. The connection between the environment and society is intricate and multifaceted, as both elements influence and shape each other in various ways. In order to examine this interconnection and interdependence through "Environmental Sciences" lenses and contribute to sustainable society, I was keen to enhance my understanding of the field by indulging in advanced knowledge, specialized skills, and exposure to cutting-edge

research. University of Yamanashi has provided me with this big opportunity in the form of "Regional Environmental Management course". REM is important as it provides a framework for harmonizing human activities with the natural environment, promoting resilience, and creating a balanced and equitable society. During this 1st year of my course, I have received full-rounded curriculum, practical experiences and field-work experiences which enhance learning experiences. We have access to well-equipped laboratories, libraries, and various other facilities for hands-on learning. Effective student support services, including academic advising, career counseling, and mentoring helps students navigate their academic and professional paths. University provides opportunities for international exchanges, collaborative research and study abroad programs as well to enrich the learning experience and expose students to diverse perspectives. I have been actively involved in G-Philos as a student assistant. Interaction and open discussions with Japanese students have provided me with insights into the dynamics of youth and cultural nuances in Japan. In the process, I have received invaluable support and guidance from my professor (Dr. IWATA Tomoya). His commitment to fostering a supportive and intellectually stimulating environment is inspiring. I am eager to contribute to the ongoing research initiatives and to learn under his guidance. I am also extremely thankful to my lab mates who have stood by me in every way possible. Their unconditional support during my initial days is something I will always appreciate. My experience so far has been enriching.



# International Education & Exchange

## Center for Promotion of Internationalization

The Center for Promotion of Internationalization offers international students a wealth of guidance and consultation services, including Japanese-language education, study support, and assistance with living-related matters, and also oversees educational research-related efforts that aim to promote study abroad programs, internationalize the University of Yamanashi, and develop global human resources. The Center uses placement testing to assign students to Japanese courses, which provide the Japanese language skills that learners need to thrive as university students. The Center also provides supplementary Japanese night classes for graduate students and international researchers who spend their days focusing on research, experiments, and other responsibilities. For undergraduates, the Center offers Japan-related courses that help students develop a deeper understanding of Japanese culture and society and other courses that focus on improving intercultural communication skills. At the Consultation Room for International Students, faculty consultants and a staff member help international students with various day-to-day issues. The Center serves Japanese students looking to study abroad, as well. By providing information on exchange programs with inter-university exchange partner universities and intensive training programs on the languages and cultures students will be encountering overseas, the Center advises and supports students from the moment they start exploring the possibilities of studying abroad until they make their return to Japan.



## International Office

The International Office provides international students with a broad range of support, making it easier for them to concentrate on their studies and get the most out of their time as University of Yamanashi students. From scholarships, visa applications, and status of residence renewals, housing for international students, exchange (study abroad) programs, coursework, to day-to-day matters, students can contact the International Office about anything they might need assistance with. We at the International Office are here to help international students communicate well with Japanese people (other students and members of the local community), learn about the culture and customs of Japan, and enrich their daily lives.

## Study abroad programs

The University of Yamanashi has student-exchange programs with 11 partner universities in Asia, Oceania, North America, and Europe. In addition to half-year and year-long exchange programs, the University of Yamanashi also offers 9 different types of Language and Culture Programs lasting two to five weeks along with a mix of internship programs for students to take advantage of. As the University's lineup of programs continues to expand, the students are showing a growing interest in study abroad opportunities and overseas internships.



## Overseas internships

The University of Yamanashi's week-long overseas internships in Iowa (US), Kentucky (US), and Zhejiang (China) enable participants to get valuable firsthand experience in their areas of specialization at local government offices, schools, hospitals, companies, and more. Through the three different internship programs, students can gain a deeper appreciation of the need for globalization, understand the importance of intercultural understanding, experience the joys and challenges of working in a foreign setting, and develop stronger aspirations to flourish as global human resources.

## Short-term programs

The University of Yamanashi also offers several short-term training programs, allowing students to enhance their understanding of Japanese language and culture and get an in-depth look at the University's unique, cutting-edge research initiatives.



## Dual degree program

Through degree-conferral agreements with Southwest Jiaotong University (China), Hangzhou Dianzi University (China), Pukyong University (Korea) and University Malaysia Perlis (Malaysia), the University of Yamanashi offers dual degree programs at the master's and doctor's (graduate) level.

## Student life support and intercultural experiences

The University of Yamanashi, faculty members, tutors, and support volunteers work together to help international students with their needs both in and out of the classroom. The schedule of outings and events for international students runs year-round, with socials (organized by the University president), field trips, Japanese cultural experiences, and more, providing students with a broad support structure and unique pathways to richer student lives.



## G-Philos: A study space for global co-creation

G-Philos is a "study space for global co-creation," a unique learning environment for international students and Japanese students to come together, mingle, and learn about each other's cultures and languages. During the lunch hour, International Student SAs (student assistants) and English Study Advisors gather at G-Philos to host an "English Café"—an event where students from countries around the world can chat in English and experience a truly international atmosphere right on campus. From browsing English-language newspapers and accessing learning materials to watching English video content, students can take their English studies to a new level with the support of English study advisors at G-Philos. The facility's offerings stretch far beyond English learning, of course; G-Philos also organizes programs where international students present about their home countries, and a variety of international-exchange events full of intercultural insights. International students can also get help with their Japanese-language studies from Japanese Support SAs, who are available at G-Philos on a daily basis.

## International workshops

In addition to sponsoring international-exchange events where participants can deepen their intercultural understanding, the University holds group workshops for University of Yamanashi students and their counterparts from abroad. At each workshop, participants choose issues to address, form teams with people from different countries, discuss the topics from their own perspectives, develop solution proposals, and present their ideas to the rest of the group. The international teams put each and every member in prime position to gain valuable skills, from learning how to collaborate on finding solutions with others across language barriers to honing the communication and leadership abilities so vital to success as a global human resource.



## Community involvement

International students at the University of Yamanashi take part in discussions with international-exchange professionals from Yamanashi Prefecture and Kofu City, international-exchange events at local elementary and middle schools, and other activities. The University of Yamanashi International Residence Halls, which provide international students with living accommodations, also welcomes local residents to mochi-tsuki (rice cake-making), international food exchanges and other events—more examples of how the University actively connects with the surrounding community.

# Faculty Introduction and Background

~ She studied abroad in Japan, and became a faculty member at the University of Yamanashi ~



I started teaching at the Faculty of Engineering in University of Yamanashi 28 years ago after having been a postdoctoral researcher at the State University of New York at Stony Brook, USA and National Institute of Advanced Industrial Science and Technology, Japan. The Computer Science and Engineering, where I teach now, was one of the first computer science departments in Japan half a century ago, helping me decide to choose this university. Our department is long-established and renowned for its education based on international-standard, rigorous computer science curriculums and many professors who have been active on the international stage. Despite of relatively small-scale, the University of Yamanashi is a comprehensive university and allows students to acquire extensive knowledge from teaching staff in various fields by its charter of "Melding Various Disciplines." The environment developed for interdisciplinary joint research is the best thing I have witnessed in my time at the university as a professor. With the motto of "the core of the community and professionals of the world," the University of Yamanashi, as the knowledge base of the community, aims to foster individuals with specialized skills who can be successful in global society. Various needs of the community have formed the inspiration for many of my researches. I am specialized in image processing, which has shown further expansion in concert with artificial intelligence (AI) and especially deep learning technology in recent years. With many international students in my laboratory, diverse cultural backgrounds give us enriched inspiration to one another, contributing to stimulating joint studies. I'd like to give examples of interdisciplinary research and community-rooted research below.

## 1. Engineering-medicine joint research: Computational glasses

Humans receive information from the outside world by the five senses, of which roughly 90% is perceived through eyes. Damage to the visual system can actually hinder daily life. Color vision defective individuals have the decreased ability to perceive important information, such as the traffic signals, causing dangerous situations frequently. A number of individuals develop eye disease as they reach an advanced age, such as visual field loss caused by glaucoma or stroke and distorted vision associated with age-related degeneration of macula in the center of the retina.

Therefore, I have been developing Augmented Reality (AR) technologies combined with image processing since 2017 JSPS Grant-in-Aid for Scientific Research (A) project. The purpose of the project is to support vision impaired individuals using an Optical See-Through Head Mounted Display (OST-HMD). In the JSPS Grant-in-Aid for Challenging Research (Pioneering) project started in 2019, I have also been engaged in development of a display technology that is capable of correcting the distorted view of a patient with metamorphopsia. I named a series of technologies developed in these researches "computational glasses." Research for assisting those with color vision deficiency makes it possible for patients to recognize an indistinguishable object by overlaying a compensating image on the OST-HMD. The study is carried out with Dr. ZHU Zhenyang, who was a PhD student from China and now is an assistant professor in our department.



## 2. Cooperation with the local community: AI & AR grape thinning assistance

Blessed with Japan's longest duration of sunshine, Yamanashi Prefecture is dubbed the Kingdom of Fruits and as its staple boasts grapes with the largest growing area and production in Japan. "Grape thinning" is one of the most important tasks in grape cultivation, which removes unnecessary grape berries to ensure the quality of the products. The number of grape berries after thinning depends on cultivars.

Even skilled grape growers find it is difficult to work efficiently over a short period of time.

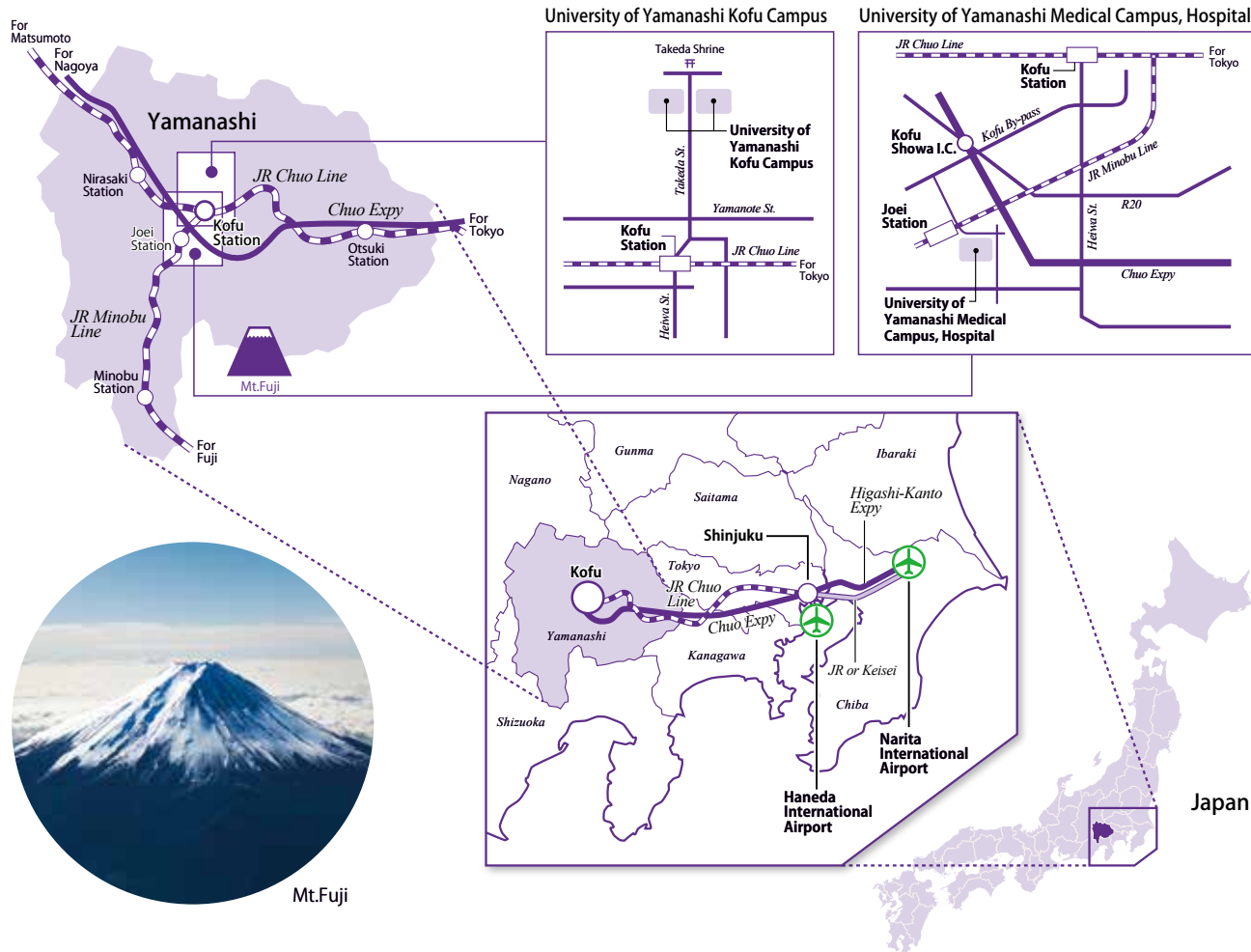
In cooperation with the farmers in the community, I am advancing my research to preserve skills with AI technology and assist grape thinning with AR. The latest deep learning technology enables a computer to learn skills and technical know-how from videos of thinning by experienced grape farmers, and analyze the condition of target grape clusters in real time during assistance. Inexperienced people can perform correct and efficient grape thinning by following instructions provided through the OST-HMD.

This research has been done with Dr. BUYAI Prawit, who was a PhD student from Thailand and currently is a post-doctoral researcher at University of Yamanashi. Having refined on the newest deep learning model, we succeeded in automatically detecting the working grape bunches at any vineyard and estimating the number of berries in the whole bunch from 2D images. A patent application has been filed for the technology. In Thailand agriculture is a key industry that supports the economy and smart farming is in great demand. Mr. Prawit always talks about utilizing the latest AI and AR technologies that he has acquired in my laboratory for the development of his home country with enthusiasm.



# ORGANIZATION

		Classification			
Faculties	Faculty of Education	Division of School Education			
	Faculty of Medicine	School of Medicine			
		School of Nursing			
	Faculty of Engineering	Department of Mechanical Engineering			
		Department of Mechatronics			
		Department of Electrical and Electronic Engineering			
		Department of Computer Science and Engineering			
		Department of Civil and Environmental Engineering			
		Department of Applied Chemistry			
		Department of Science for Advanced Materials			
	Faculty of Life and Environmental Sciences	Department of Biotechnology			
		Department of Local Produce and Food Sciences			
		Department of Environmental Sciences			
Department of Regional Social Management					
Graduate Schools and One-Year Advanced Program	Graduate School of Education Master of Education's Course		Advanced Studies on Transforming Educational Practice		
	Integrated Graduate School of Medicine, Engineering, and Agricultural Sciences	Master's Course	Department of Biomedical Science		
			Department of Nursing Science		
			Department of Engineering	Mechanical Engineering Course	
				Electrical and Electronic Engineering Course	
				Computer Science and Engineering Course	
				Mechatronics Course	
				Civil and Environmental Engineering Course	
				Applied Chemistry Course	
				Advanced Material Science Course	
			Special Educational Program on River Basin Environmental Science		
		Special Educational Program for Green Energy Conversion Science and Technology			
		Department of Life and Environmental sciences	Bioscience Course		
Food and Wine Science Course					
Regional Environment Management Course					
Doctor's Course (4Year's)		Department of Medicine			
Doctor's Course (3Year's)	Department of Nursing and Health Science				
	Department of Engineering	System Integration Engineering Course			
		Energy Materials Science Course			
		Environmental and Social System Science Course			
	Department of Integrated Applied Life Science	Agricultural Science Course			
Biomedical Science Course					
Bioengineering Course					
Special Advanced Program in Special Needs Education		Education for Children with Disabilities			



**Contact details**

**General inquiries concerning education for international students, becoming a research student, or becoming a non-degree student**

International Office, University of Yamanashi  
 TEL : 055-220-8047  
 E-mail : [yu-study-abroad@ml.yamanashi.ac.jp](mailto:yu-study-abroad@ml.yamanashi.ac.jp)  
 URL : <http://www.ciee.yamanashi.ac.jp/>

**Information on entrance examinations and obtaining application guidelines for regular students**

Admission Division, Academic Affairs Support Department, University of Yamanashi  
 TEL : 055-220-8049  
 Email: [nyushi@yamanashi.ac.jp](mailto:nyushi@yamanashi.ac.jp)



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