



Faculty of  
Graduate School of

# Medicine



Osaka Medical and  
Pharmaceutical University





Osaka Medical and Pharmaceutical University was created as an educational corporation through the merger of Osaka Medical College and Osaka University of Pharmaceutical Sciences. The two founding universities both have a history stretching back almost a century, and while we have inherited the traditions built up over this time, Osaka Medical and Pharmaceutical University has also taken a new step toward becoming a leading comprehensive medical university characterized by interprofessional education.

Within the framework of the United Nations University Sustainable Development Goals (SDGs) University Platform, we will carry out education and research with an international outlook and high-quality medical care, in order to fulfill our social responsibility as a medical university and university hospital with regard to the SDGs targets.

One of the areas we place greatest importance on to ensure that we maintain an international perspective is international exchange. The Nakayama International Center for Medical Cooperation, which was established under the initiative of Dr. Taro Nakayama, former Minister of Foreign Affairs of Japan and an alumnus of Osaka Medical College, has been playing a pivotal role in the international exchange activities of undergraduates and faculty members. At present, international exchange is temporarily being carried out in cyber space because of the global state of emergency due to the COVID-19 pandemic. We are pleased to share our plan to expand international exchange in the field of medical, Pharmaceutical and nursing science, and also their practices globally. Our approach will involve a unique blend of physical, and cybernetic spaces, allowing for diversified and innovative collaborative methods. I kindly ask for your guidance and cooperation.

President

Kouichi Sano, M.D. Ph.D.



Osaka Medical and Pharmaceutical University, which was created in spring of this year, has a vision comprising the following six goals for a comprehensive medical university: innovation, inter-professional education, translational research, social contribution, transparency, and globalization. The importance of practical English skills as a tool in today's globalized world is obvious, and nowadays medical scientific information is shared in English. Osaka Medical and Pharmaceutical University encourages students to improve their language skills, especially from the early years, and to study abroad in their senior years. This is not just to improve foreign language communication skills, but also to nurture doctors with a global perspective through the experience of

overseas medical care.

At the heart of these globalization efforts is the Nakayama International Center for Medical Cooperation. The main activities of the center are to conclude academic exchange agreements with overseas academic institutions and to improve the level of education and research through mutual exchanges of faculty members and students, implementation of joint research, and exchange of academic information. International exchange agreements have currently been concluded with 15 overseas institutions, and mutual support for study abroad is being provided by a system of counterparts. The experience of cross-cultural exchange while studying at university will be of enormous value to the next generation of doctors working in the field of medicine, which requires a high level of intellectual expression.

Perhaps you too would like to make use of the Center to find out about cutting-edge medical care in other countries.

Dean, Faculty of Medicine

Kazuhisa Uchiyama, M.D. Ph.D.



大阪医科薬科大学

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**1904**

Osaka Doshu School of Pharmacy was founded

**1950**

Establishment of Osaka College of Pharmacy was approved

**1968**

Two-department system, the Department of Pharmacy and the Department of Pharmaceutical Technology, was introduced

**1975**

A Master's program in Pharmaceutical Sciences was established

**1984**

A Doctoral program in Pharmaceutical Sciences was established

**1986**

Osaka College of Pharmacy was renamed  
Osaka University of Pharmaceutical Sciences

**2006**

The Department of Pharmacy (6-year program) and the Department of Pharmaceutical Sciences (4-year program) were established

**2010**

A Master's program in Pharmaceutical Sciences at the Graduate School of Pharmaceutical Sciences was established

**2012**

A Doctoral program in Pharmacy at the Graduate School of Pharmacy (4-year program) was established



**Merger of OMC and OUPS, 2021**

**Osaka Medical and Pharmaceutical University**

# Medicine with Integrity

## Mission

Fostering expertise and a sense of humanity to become leaders in medical fields.

Our mission is to train individuals who can help to maintain and improve the health and well-being of mankind by becoming the best medical specialists, educators, or researchers with a global mindset.

## Educational Objective

We will provide education for the purpose of developing the following medical professionals: those who hold a rich sense of humanity who will strive to maintain and improve health as a common challenge for humankind; who will prevent and overcome diseases while working to reduce the pain and suffering caused by the diseases; who will respond to the ever-changing needs of society and continually acquire the latest knowledge and skills throughout their lives; and who, with their inquiring minds, will be active throughout a broad area ranging from local medical care to world-class research and development.

1927

Osaka Higher School of Medicine was founded

1929

The School of Nursing,  
Osaka Higher School of Medicine  
was established

1952

Establishment of Osaka Medical College  
(new university system) was approved

1959

A Doctoral program  
at the Graduate School of Medicine  
was established

1978

The School of Nursing,  
Osaka Higher School of Medicine  
was renamed  
the School of Nursing, Osaka Medical College

2010

The Faculty of Nursing was established

2014

The Graduate School of Nursing was established

2020

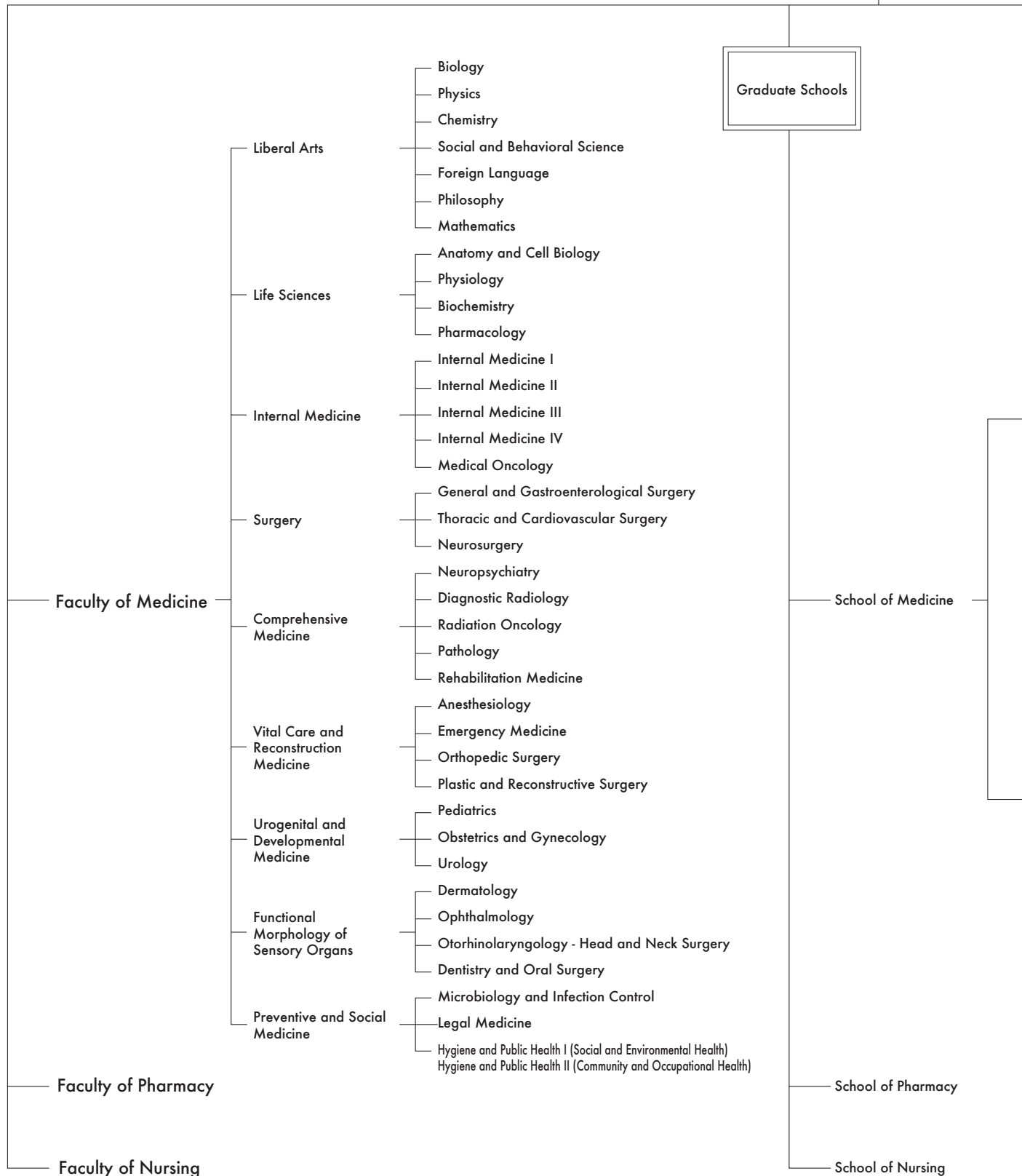
A Master's program  
at the Graduate School of Medicine  
was established

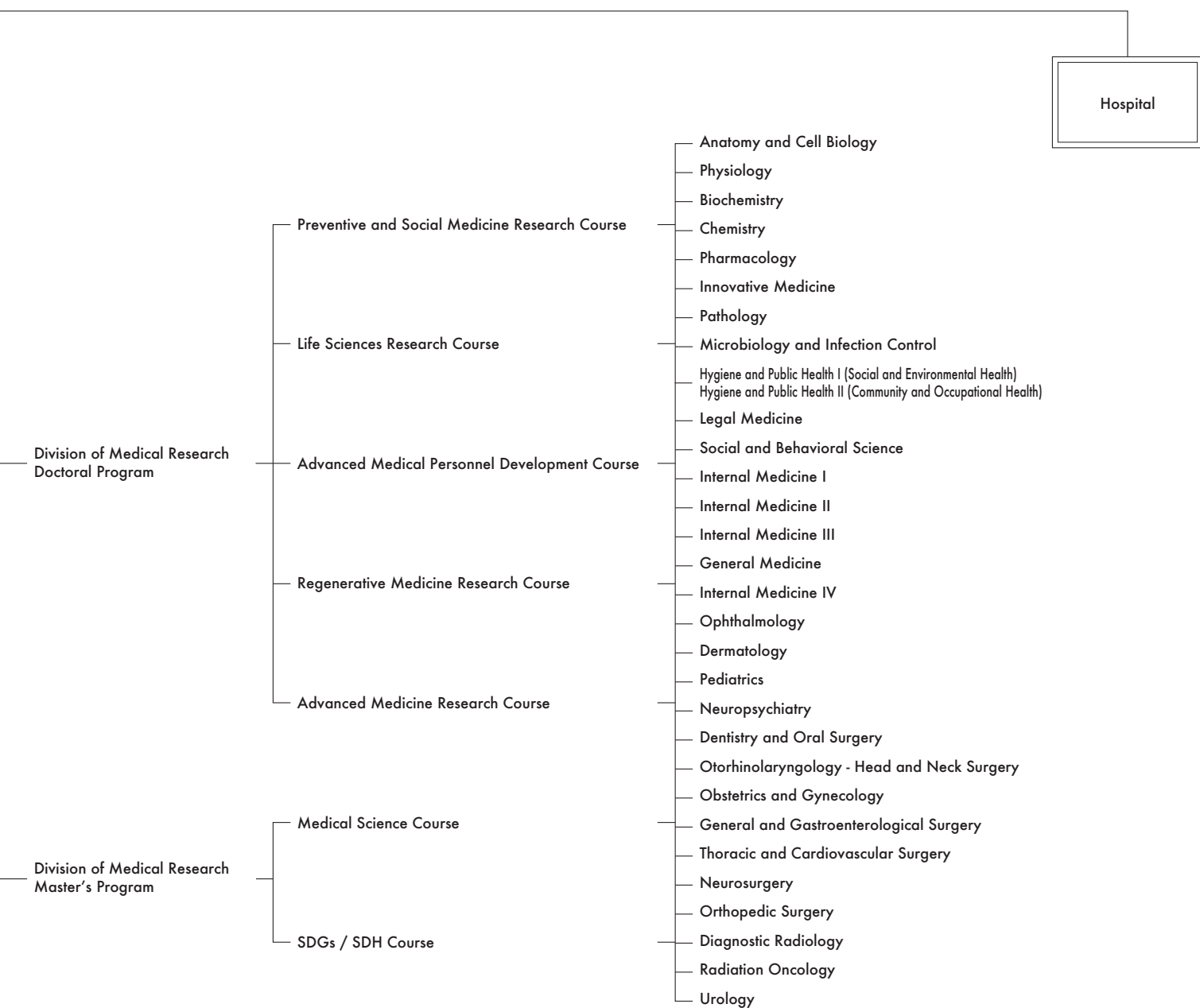
is established.

# Organization Chart

Relevant to the Faculty of Medicine

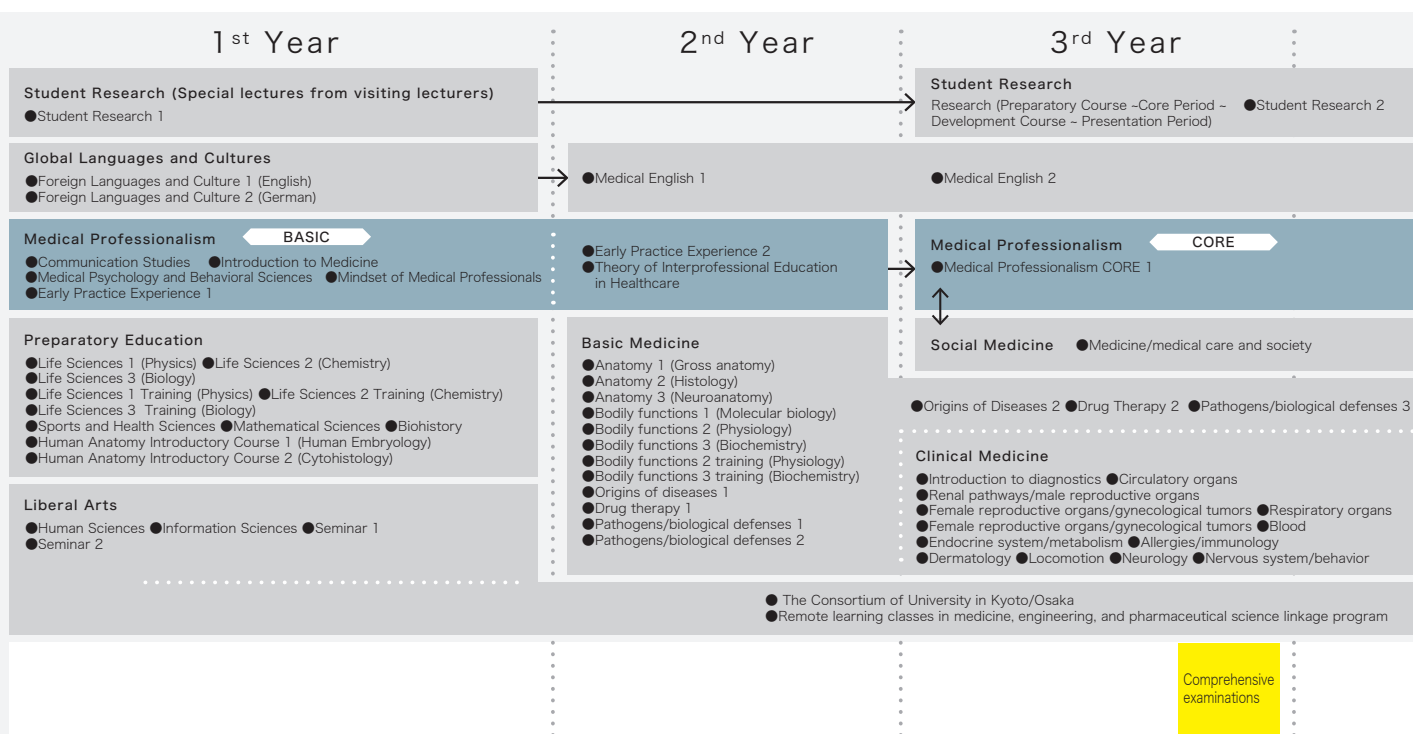
Osaka Medical and  
Pharmaceutical  
University





# Medical Education

## Faculty of Medicine



## 6 features of the curriculum at Faculty of Medicine

### 1. Meeting global standards

Our university's curriculum has been adapted to meet the internationally accredited curriculum. The clinical clerkship especially ensures a total of 66 weeks consisting of 44 weeks of "core clinical clerkship" and 22 weeks of "advanced clinical clerkship".

### 2. Introducing of the "Clinical Textbook"

The ethos of "self-directed independent learning" has been passed down through the generations at our university. The "Clinical Textbook" was introduced to reinforce this ethos in each and every student. Tablet computers are provided to students free of charge, and digitalized learning resources and course materials are electronically distributed to students. Aiming to motivate students to learn independently, the students are simply presented with a guideline outlining what tasks need to be completed by when. This in turn encourages the students to learn at their own pace and gain independence, in other words, acquire a habit of self-directed learning.

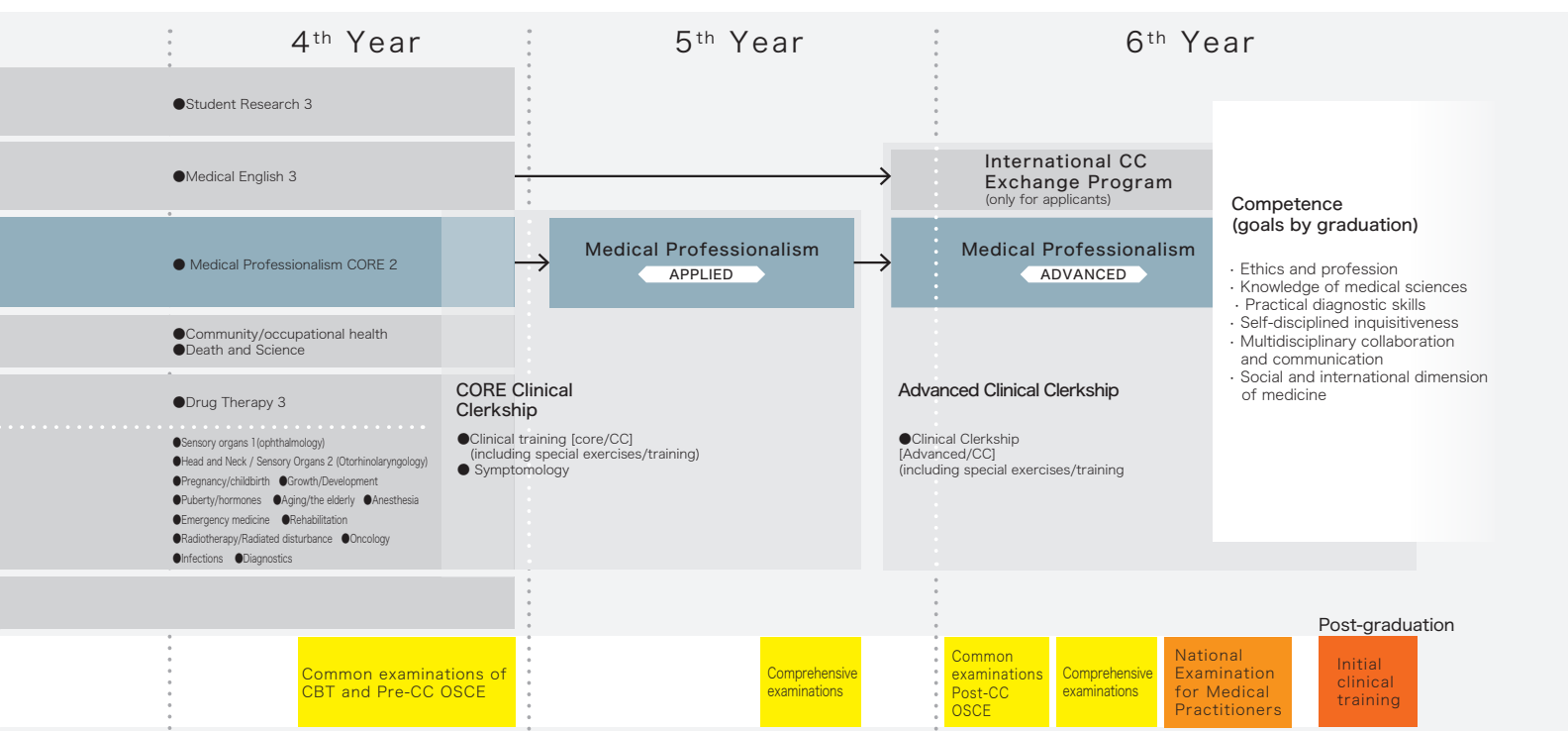
### 3. Promoting active learning

Group discussions including faculty members, presentations and interactive active learning using ICT have been incorporated throughout the 6-year curriculum. The key component of active learning is constantly asking the learner "what will you do?" to encourage proactivity and independence. By repeating their own research and thinking on their own, students acquire the ability to come up with their own answers.



# Educational Goals

1. Fostering a rich sense of humanity to respect the lifestyles and values of people based on the dignity of life and the respect for human rights.
2. Fostering the competence to create and obtain the latest knowledge and skills that can be applied internationally in the areas of medicine and medical care through collaborations with various professionals.
3. Developing the ability to provide medical care based on scientific knowledge and ethical judgment by effectively using the expertise in diseases and cure, information and skills.
4. Developing the ability to deal with various health issues as a medical practitioner by acquiring knowledge of the specific qualities of the local community and collaborating with other professions.
5. Developing the fundamental attitude to voluntarily inquire further into one's own expertise as a medical practitioner and to continue to develop such expertise.



## 4. Student research initiatives

In the first year, students are given an introductory lecture on "What is medical research?", and mainly in the third and fourth years, they are given time to engage in student research. The topic can be either basic or clinical medicine. The study results are presented on- or off-campus through oral or poster presentation. The aim is to foster a research mindset in the students, to help them develop the ability to identify and solve their own research questions, and to enable them to practice evidence-based medicine (EBM) as medical doctors. Students can also do research starting at any year of their studies by using the "Student Researcher System" and belonging to a research department.

## 5. Promoting International Exchange

One of our university's unique features is the international exchange program. Studies abroad are promoted through collaboration with Global Center (See p.19). English is a requirement for international communication. Studying abroad becomes more accessible to students through the Foreign Languages and Culture course in the first year and English education such as the Medical English course in subsequent years.

## 6. Fostering professionalism

Due to the changing demands of patients and society towards medical doctors and healthcare, medical doctors must have, not only specialized knowledge and skills, but also sincerity, humanity and communication skills. One must possess a strong sense of professionalism as a medical doctor and be aware that there is a public interest component to the occupation. Professionalism that is indispensable to medical doctors is nurtured starting in first year with "Medical Professionalism" and Interprofessional Education (IPE).

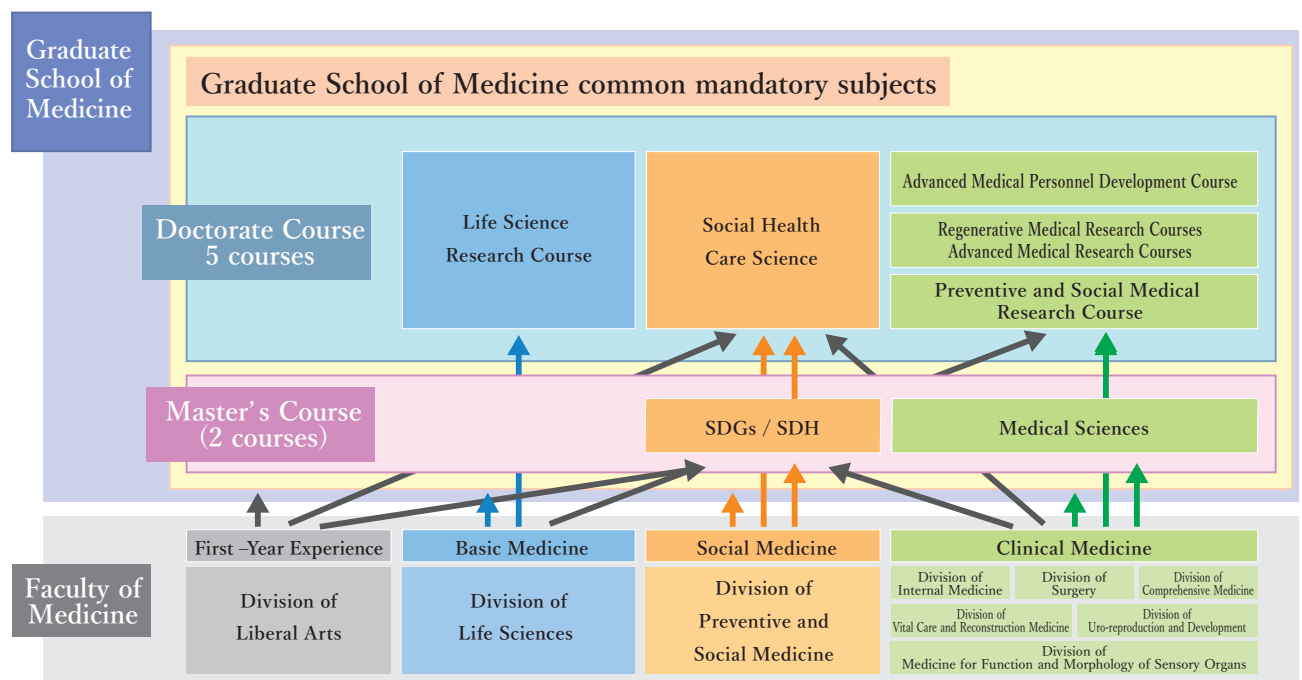
# Graduate School of Medicine

## Educational Purposes

Our aim is to contribute to the development of society through the development of medical professional with a rich sense of humanity who have advanced medical knowledge and skills.

## Educational Ideal

Our education philosophy is to foster the advanced research capabilities and abundant disciplines required to become international leaders in medicine and healthcare, who also have a rich sense of humanity.



### 1. Research rooted in clinical practice

Based on the founding ethos, research at our university has focused on its application in clinical practice. Our achievements—being chosen to participate in large-scale research projects such as the Japan Agency for Medical Research and Development (AMED) projects and extensive collaborative research with manufacturers of medical devices and materials—reflect this.

### 2. Supporting students to earn a degree while working

The Graduate School of Medicine has an admission policy for mature students. The majority of our students are studying towards their degree while working in hospitals, etc. For students in the Master's Program who have been given approval to extend their degree completion can receive a tuition waiver for the third year.

### 3. Common subjects in the Graduate School of Medicine

The Graduate School of Medicine offers "Integrated Lectures" (compulsory subject) as a common subject of the graduate program. This subject is offered to students in the Master's and Doctorate Programs to acquire ethical awareness and advanced research skills. Together in the same classroom, they acquire basic knowledge and learn about the norms of research needed in medical research. Students also present each other's research findings. It is a place where students from both programs can interact with one another.



# Main research of each department

## Biology

### A multifaceted approach to unraveling the environmental adaptation mechanisms of living organisms

Living organisms have mechanisms to adapt to fluctuating environments. In our laboratory, we focus on the environmental adaptation mechanisms in plants and fishes. To understand the mechanisms of cellular responses to environmental stimuli, adaptive evolution, and speciation, we study various biological problems using the methods of physiology, cellular biology, evolutionary biology, molecular genetics, and bioinformatics.

- Molecular mechanisms of environmental responses in plants
- Molecular mechanisms of adaptive evolution and speciation in fishes

## Physics

### Understanding biological phenomena through expression mechanisms of biomolecules and their functional analysis

It is astounding to see the sophisticated intermolecular networks and elaborate molecular complexes when we look at biological activity at the molecular level. To discover their operating principles, we study the behaviors and functions of various molecules and complexes in living organisms.

- Identifying the control mechanism of gene expression altered by cells responding to the environment
- Identifying the function of 100S ribosome expressed in response to stress
- Investigating the operating principles of ATP synthase (biomolecular motor) using single-molecule observation

## Chemistry

### Telling the story of life through chemistry

Elementary particles—atoms—molecules—cells—individuals—society. In this hierarchical organization, chemistry is an academic discipline that focuses primarily at the level of molecules. The Department of Chemistry focuses on a broad range of research topics, connecting atoms to cells.

- Bioorganic chemistry
- Education of catalytic mechanisms based on quantum chemistry
- Unraveling biological phenomena involving phosphoric and its derivatives
- Identifying the causes of diseases with proteomic analysis

## Social and Behavioral Science

### Epidemiological research on social determinants of health (SDH)

The Social and Behavioral Sciences Department is devoted to exploring the complex connections between health and society via a multi-layered approach, looking equally at individual factors such as psychological traits and behaviors, to social factors such as socioeconomic status, income inequality, gender, and social capital, norms, systems, and policies. Our research aims to answer the question, "How can society 'nudge' people to make better health decisions and lead healthier lives?" by analyzing datasets from large cohort studies. Our goal is to draw on these findings to propose new health promotion activities and social reforms.

- Social inequality in health
- Health effects of residential environment
- Health effects of gender

## Foreign Language

### Medical English education and research using the ESP approach

Faculty members specializing in English education, German literature, and British and American literature play a role in providing liberal arts education in the undergraduate program. They also engage in corpus construction, vocabulary analysis, genre analysis, and teaching materials development from an English for Specific Purposes (ESP) perspective, aiming to fulfill the unique English education needs of the Faculty of Medicine.

- ESP vocabulary research using corpora
- Use of ICT in medical English education
- Research on Heinrich Heine
- Research on the historical ideology of British Romanticism

## Anatomy and Cell Biology

### Anatomy: The Oldest and newest field of medicine

We conduct basic research on mechanism of diseases and development of treatments based on morphological methods. Research tools such as iPS cells, cell transplantation for regenerative medicine and cancer research, immunostaining, in situ hybridization histochemistry, electron microscopy, and gene editing techniques are used.

- Regulating the differentiation of human iPS cells into neural cells
- Identifying the pathogenesis of Alexander disease (one of leukodystrophies) using iPS cells
- Application of glial progenitor cells in regenerative medicine
- Identifying molecular mechanisms of cancer metastasis

## Physiology

### Exploring the mechanisms of phenomena that occur in the body

We study the basic mechanism behind biological phenomena and their medical application using research models such as zebrafish, frogs, mice as well as humans. Our daily research focuses on projects in areas such as the nervous system, circulatory system, renal system, endocrine system, and reproductive system using a combination of experimental techniques from genetics, electrophysiology, optics, and molecular biology.

- Acetylcholine receptor
- Potassium channel
- Visualization of molecular motion in living animals
- Release mechanism of neurotransmitters
- Hormone receptors and signal transduction cascade
- Muscle physiology
- Kidney physiology
- Reproductive mechanisms

## Biochemistry

### Understanding life phenomena at the molecular level

Our research aims to identify functions of proteins based on their three-dimensional structures and interactions between proteins and low molecular compounds. Through these findings, we hope to understand pathological conditions at the molecular level and provide the foundation for developing treatment strategies.

- Analysis of reaction mechanisms of enzymes and proteins
- Analysis of mechanisms of bacterial pathogenicity such as biofilm formation
- Analysis of sphingolipid metabolism
- Analysis of DNA mismatch repair mechanism

## Pharmacology

### Discovering new pathological mechanisms of intractable diseases and its application to drug discovery

In pursuit of discovering new pathological mechanisms, our research approaches cardiac failure, cancer, and congenital genetic disorders from a non-conventional angle. Our goal is to search for target candidate molecules for new drug discovery, collect basic data on the target molecule of interest for clinical application, and ultimately contribute to drug development.

- Identifying the control mechanism of calcium signaling proteins and store-operated calcium entry (SOCE) in cardiac failure and developing relevant drugs
- Identifying the control mechanism of O-GlcNAc modification in cardiac failure and cancer, and developing relevant drugs
- Identifying the pathological control mechanism of ubiquitin and proteasome systems (UPS) and autophagy, and developing relevant drugs
- Establishing a pathological model of congenital genetic diseases using iPS cells modified by the latest genome editing technology and developing relevant drugs

## Internal Medicine I

### Training good physicians: Solving clinical questions with research

The Department of Internal Medicine I consists of three clinical departments : Endocrinology and Diabetology, Respiratory Medicine and Thoracic Oncology, and Hematology. In addition to striving to become good clinical physicians, we also conduct research to answer questions raised in daily clinical practice and try to apply the findings in clinical practice.

- Compilation of a comprehensive database of Japanese patients with Type 1 diabetes and its clinical application
- Identification of the mechanism of cardiotoxicity of antineoplastic drugs and their countermeasures
- Stratification of multiple myeloma based on TNF  $\alpha$  and receptor expression, and prognostic prediction

## Internal Medicine II

### From “OMPU to the World” - We nurture unique talent

Internal Medicine II covers treatments of gastrointestinal diseases of gastrointestinal tracts (the esophagus, stomach, small intestine, large intestine), liver, biliary tract, and pancreas. We undertake highly advanced medical treatment as a university hospital. Amid increasing specialization and sophistication of healthcare, we have continued clinical research to be able to address various gastrointestinal diseases. We provide special testing such as endoscopy, ultrasound, and angiography, and the latest tests and treatment making even greater use

Elucidation of the pathophysiology of gastrointestinal diseases, treatment development and clinical application

- Development of interventional endoscopy techniques for bile and pancreas surgeries
- Basic research and application of medication for non-alcoholic fatty liver disease
- Elucidation of the state of inflammatory bowel disease and establishment of therapeutic methods
- Development of more precise personalized medicine in the field of gastrointestinal cancer

## Internal Medicine III (Cardiology)

### “The Department where everyone’s faces shine” as our motto, we want to collaborate with the world!

Passion radiates from everyone in our department. The disease structure of cardiovascular disease is changing dramatically due to the rapid aging of the population. Together with our multidisciplinary colleagues, we are trying to generate evidence. In particular, results on the relationship of oral environments and exercise habits with cardiovascular disease have started to emerge. We believe that we can build inroads by collaborating in many other healthcare and nursing settings.

- Clinical research for investigating prognostic improvement using clinical data on heart failure (registry)
- Development of sensitive testing methods (echocardiography, etc.) for the early detection of myocardial damage
- Clinical significance of myocardial and vascular disorders using MRI
- Relationship between the oral environment and cardiovascular disease



## Internal Medicine IV

### Aiming to develop novel diagnostic and treatment methods for intractable neurological diseases and connective tissue disease

The Department of Internal Medicine IV consists of the neurology and the rheumatology department and we are dedicated to treating intractable diseases. Many diseases that were once thought to be intractable are now treatable, causing a paradigm shift in the treatment of intractable diseases. To accelerate this change, we engage in clinical and basic research aiming to provide new diagnostic and treatment methods through the acquisition of the latest knowledge and improvement in technology.

- Development of drug therapies to inhibit the formation and propagation of  $\alpha$ -synuclein aggregates in Parkinson's disease
- Identification of factors that influence the prognosis of Parkinson's disease patients and search for preventive measures
- Analysis of the formation enhancement mechanism of atherosclerotic lesions in rheumatoid arthritis using mouse models
- Development of new therapeutic drugs targeting macrophages for the intractable condition in connective tissue disease

## Medical Oncology

### New medicine development isn't just about seeking next-generation treatments, it's about rediscovering the power of current standard treatments.

Our objective is to train oncologists with a research-oriented mindset, capable of practicing advanced and multidisciplinary oncology, including genomic medicine, in a cross-organizational manner. We firmly believe that "Medical Oncology" is a science that coexists with patients and society. As a nexus for cross-disciplinary knowledge, experience, and information, the Department of Medical Oncology will also function as a concierge for cancer diagnosis, with the aim of becoming a trusted department that can make valuable contributions to the community.

- Elucidation of pathogenesis of thoracic malignancies and development of novel therapies
- Elucidation of the pathogenesis of molecular targeted therapy-induced cardiac and liver damage
- Clinical application of novel palliative and supportive care therapies
- Social medicine research (epidemiology, survivorship, health disparities, cancer education, information dissemination, etc.)

## General and Gastroenterological Surgery

### Bench to Bedside: Medicine is always in transition

Medicine is always evolving, so we strive to train medical professionals that can navigate paradigm shifts bounded by the axes of continuation and innovation. Through the exchange of clinical and research issues based on a vast number of cases and an established research system, we are committed to training and researching to create new knowledge. We aim to actively develop interdisciplinary research across disciplines focusing on common goals such as "overcoming cancer".

- microRNA drug discovery through interdisciplinary research in medicine, engineering and pharmacology
- Identifying pathological conditions using clinical samples and developing research models
- Cancer pathology research using non-coding RNA
- Research on surgical techniques and surgical devices

## Thoracic and Cardiovascular Surgery

Department of Thoracic and Cardiovascular Surgery is dedicated to providing health care, education, and research spanning across three areas: adult and pediatric cardiovascular surgery and respiratory surgery. To provide the best possible outcome for patients undergoing treatment, we are involved in the development and improvement of surgical techniques and surgical devices and engaged in the creation and application of new treatment concepts. These technological innovations are brought in the education before and after graduation. The most important mission of our department is to contribute to the public healthcare with a guarantee of safety and perfection.

- Optimizing curability and biological invasion in direct surgery of the heart, major blood vessels, lungs and mediastinal diseases
- Analysis of disease-specific outcomes with the introduction of transcatheter cardiovascular surgery
- Creation of therapeutic technologies for congenital cardiovascular disease and development of biocompatible surgical materials
- Surgical treatment and immunotherapy for respiratory malignant tumors

## Neurosurgery

### Providing safe and minimally invasive surgical and endovascular treatments for the brain and spinal pathologies

Microscopic and/or endoscopic surgeries for resection of brain and spinal tumors including skull base tumors are performed in hybrid operating rooms with multi-detector row CT and angiography machine. Our endovascular team excels in the treatment of intracranial aneurysms and AVMs using by coils, flow diverter stents, particles, and liquid materials. In addition to the treatment of tumors and cerebrovascular diseases, we have performed many operations for hemifacial spasms, trigeminal neuralgia, and normal pressure hydrocephalus. Treatment with Boron Neutron Capture Therapy (BNCT) for malignant meningioma is also being conducted.

- Molecular mechanism of radiation necrosis in the brain
- Effect of radiation therapy based on the characteristics of tumor stem cells
- Application of Boron Neutron Capture Therapy (BNCT) for central nervous tumors
- Surgical application of virtual reality images
- Molecular mechanism of the invasion and migration of malignant brain tumors

## Neuropsychiatry

### Science of the mind

All humans have minds and we have often been in awe of their wonder. Psychiatry is an academic discipline where mechanisms can be approached from a genetic or brain science perspective. Using traditional clinical psychiatry as the starting point, we investigate psychiatric diseases at the level of science required in this modern age and the results have successively been shared with the rest of the world. Setting the stage to the vast unexplored areas of genes and the brain, we want to discover the mysteries of the mind that no one has ever seen before.

- Clinical psychiatry (depression, dementia, schizophrenia, Gender Identity Disorder, epilepsy, adolescence, Post-Traumatic Stress Disorder, psychotherapy/psychosocial intervention, etc.)
- Clinical application of brain science such as optical topography tests, repetitive Transcranial Magnetic Stimulant treatment, and neurofeedback for psychiatric diseases
- Identifying pathological conditions of psychiatric diseases using state-of-the-art molecular genetic techniques

## Diagnostic Radiology

### Achieving patient-friendly medical care through the optimization of diagnostic imaging and minimally invasive interventional radiology (IR)

The latest medical imaging devices such as CT, MRI, and PET are fully utilized to determine the pathological conditions of diseases affecting the organs and systems throughout the entire body. Endovascular or CT-guided IR therapies are pursued for non-surgical minimally invasive treatments. We strive to realize patient-friendly medical care by searching for imaging tests with minimal patient burden and exploring treatment options that preserve organs and functions.

- Imaging assessment of tumor invasion depth in bladder cancer and bladder-sparing treatment using balloon-occluded arterial infusion chemotherapy
- Imaging diagnosis and function-preserving therapy with endovascular treatment for intractable vascular anomalies
- Optimization of diagnostic imaging in staging and therapeutic evaluation of various solid cancers
- Application to high-precision treatment strategies using the nuclear medicine approach

## Radiation Oncology

### Optimal radiation therapy for all who need it!

The history of radiation therapy parallels that of cancer discovery. Cancer treatment can be researched from various angles such as through biology and physics. Clinically, the optimal treatment strategy for each disease is explored, from radiation treatment alone to multimodal treatments combining surgery, chemotherapy, and others.

- Clinical research on treatment outcomes and adverse effects of short course hypofractionated radiation therapy after breast-conserving surgery
- Clinical research on combined therapy of radiation with intra-arterial cisplatin for invasive bladder cancer
- Basic and clinical research of a new enzyme-targeting radiosensitization treatment (KORTUC) for unresectable locally advanced or metastatic breast cancer
- Physical and clinical research on image-guided treatment planning for high dose rate interstitial brachytherapy

## Pathology

### Analyzing carcinogenesis and prevention mechanisms based on morphology

Molecular pathological studies on carcinogenesis and prevention mechanism are conducted on pathology specimens, animal models, and cell strains targeting solid tumors such as colon and kidney cancer.

- Roles of metabolic factors in colon cancer
- Early changes in renal carcinogenesis
- Lung cancer research focused on mTOR signaling pathway
- Pathological study of salivary gland tumors

## Rehabilitation Medicine

### With a life expectancy beyond 100 years, the ways to survive and thrive in a world with few young, much elderly and nowhere to die would be disclosed!

During all periods from the acute phase through the recovery phase to the period of life in the community, by greatly fostering the activities that form the basis of human life, we thoroughly pursue the essence of rehabilitation medicine, which has as its ultimate goal, the recovery of physical and mental functions impaired by disease, trauma and so on, and letting people overcome their disabilities.

- Development of apps to increase adherence to rehabilitation treatments for rheumatoid arthritis.
- Development of tools to optimize rehabilitation support in times of disaster.
- Study on real-time measurement of physical movements to maintain activity and reduce the risk of falls in elderly.
- Research on the development of anti-inflammatory and anti-tumor effects through modulation of immune functions by exercise.

## Anesthesiology

### In search of the mechanisms of neuropathic and cancer pains

As a university hospital, we undertake clinical research in the fields of surgical anesthesia, intensive care, and pain clinic that is advanced and at the leading-edge of medical care. Our basic research focuses on identifying the mechanisms of intractable pains such as neuropathic and cancer pains, aiming to apply the findings to drug discovery and contribute to society.

- Identifying the role of glial cells in neuropathic pain
- Identifying the mechanism of neuropathic pain targeting the metabolic mechanisms of astrocytes
- Identifying the mechanism of cancer pain using bone metastasis models and its application in therapeutic drugs
- Clinical research of intractable pain

## Emergency Medicine

### Exploring the pathological mechanisms of all emergency diseases in the acute phase

Emergency medicine needs to respond to all types of diseases in the acute phase in both men and women of all ages regardless of whether medical or surgical treatment is needed. Biological responses to acute stress, which occur suddenly from a normal state, in other words, the "identification of defense responses to invasion", is an important research topic in emergency medicine. Problems related to social structure such as emergency transportation systems and disaster response also need to be addressed.

- Developing new resuscitation methods for severe hemorrhagic shock
- Research utilizing big data on cardiac arrest outside hospital
- Research on early diagnosis and severity assessment of severe infectious diseases
- Research on the effectiveness of emergency systems from a public health approach
- Establishing the foundation for research including the centralized management of clinical information and biological samples of COVID-19
- An Immunopathological evaluation of COVID-19 using mass cytometry
- A comprehensive analysis of the immune response following severe invasions such as sepsis and external injury using mass cytometry



## Orthopedic Surgery

### For recover and enhance of “Quality of Life”

Orthopedic surgery provides treatment for traumatic injuries, disease-related pain, functional disorders, and deformities at bones, joints, nerves, muscles, tendons, and ligaments. The members of Department of Orthopedic Surgery are the experts in almost all areas of orthopedic surgery such as the spine and spinal cord, hand, shoulder, hip, knee joints, foot, rheumatoid arthritis, pediatric orthopedics, scoliosis, and tumors.

- Identifying the pathology of cervical myelopathy using high-performance ultrasound
- Identifying new treatments for rotator cuff tears and elucidating the healing mechanism of superior capsule reconstruction
- Developing new cartilage and meniscal scaffolds for biological knee reconstruction and establishing the relevant therapeutic strategies
- Identifying the pathology of carpal tunnel syndrome and toe deformities using ultrasound

## Plastic and Reconstructive Surgery

### Restoration of form and function with state-of-the-art technology

The Department of Plastic and Reconstructive Surgery is engaged in a wide range of research directly related to daily clinical practice such as surgical simulation using augmented reality (AR) technology, surgical evaluation with ultrasound and 3D imaging, development of therapeutic materials for lymphedema, and bone regeneration with stem cells.

- Development of comprehensive surgical information sharing systems using AR technology
- Development of new bone regeneration therapies using adipose-derived stem cells and W9 peptide
- Development of materials using air pressure to replace multilayer bandaging for lymphatic edema
- Ultrasound examination for nasal bone fractures using water as a contact medium

## Pediatrics

### Delivering a bright future to all children

The Department of Pediatrics has research groups that cover all areas of pediatric practice, which allows exploration in not only each individual's area of practice and expertise but also sheds light on universal biological phenomena in children. From a scientific point of view, one develops the ability to observe, analyze, and judge phenomena affecting children. One also gains application skills by acquiring specific practical and technical skills. We strive to provide holistic medical care that respects each individual child.

- Discovering the etiology of pediatric nephrotic syndrome (mainly the involvement of oxidative stress)
- Investigating the vascular endothelial function in pediatric diseases
- Identifying the mechanism of onset of chronic neonatal lung disease and developing new treatment methods
- Identifying the pathogenesis of learning disabilities and their relevant intervention methods

## Obstetrics and Gynecology

### Building a bridge to the next generation of medical care

The Department of Gynecology performs over 200 surgeries a year for uterine and ovarian cancer, including rare cancers, and the Department of Obstetrics treats various diseases associated with pregnancy such as gestational hypertension. We are aiming to acquire new knowledge by utilizing the vast number of specimens collected from resected cancer tissue, blood sampling, placenta, and cord blood.

- Research on the pathological condition of gynecological malignancies and therapeutic applications
- Effects of iPS cells on tumor immunity using Patient-derived xenograft (PDX) model
- Application of artificial intelligence (AI) in fetal ultrasound screening
- Exploration of novel therapies using miscarriage/preeclampsia mouse models

## Urology

### In search for the best treatment for lesions in the retroperitoneal space and reproductive system

The Department of Urology offers advanced treatments for genitourinary tumors, renal replacement therapy for renal failure, urinary tract stones, infertility, and other diseases. In particular, we have extensive experience in clinical trials of treatments for malignant tumors, and continue to engage in research around the clock to always provide the best possible medical care for our patients.

- Bladder preservation method (OMC-regimen) for localized invasive bladder cancer
- Individual functional analysis of genes responsible for male infertility
- Search for prognostic factors of urologic tumors
- Sequence analysis of specimens in the across clinical departments interdepartmental Osaka Medical College Biobank (OMC-BB)

## Dermatology

### Engaging in state-of-the-art dermatology research aiming to “understand through observations”

Dermatology encompasses aspects from both internal medicine and surgery. Pathological conditions are identified based on information obtained through meticulous visual examinations, utilizing the latest advanced findings in pathology and molecular biology, and at times relying on surgical methods. We engage in research to develop the latest and best treatments.

- Molecular cytology of genetic photosensitivity
- Exploration of new treatment methods for atopic dermatitis and psoriasis using mouse models
- Evaluation of oxidative stress level in patients with various types of skin diseases
- Development of new treatment methods for malignant skin tumors using Boron Neutron Capture Therapy (BNCT)

## Ophthalmology

### Promoting every research at the forefront that contributes to the future of clinical ophthalmology

On the clinical front, we provide the best possible patient treatment across all areas of eye care by our exceptional specialists, including retina, neuro-ophthalmology, strabismus & amblyopia, glaucoma, cornea & cataract, and uveitis, etc. On the research front, our scientific findings are being shared with the rest of the world. On the educational front, we are committed to offer pre- and post-education that emphasizes excellence, ethics, and humanity, necessary to provide skilled and compassionate care to patients.

- Discovery of new pathomechanism leading to retinal vein occlusion
- Research for the neuroprotection against retrograde axonal degeneration after optic nerve injuries
- New insights into the mechanism of diabetic macular edema -possible involvement of aquaporin 4-
- Research on glaucoma and ocular circulation

## Otorhinolaryngology-Head and Neck Surgery

### Providing highly specialized medical care for diseases affecting the sensory organs or head and neck tumors

We strive to provide wide-ranging, highly advanced medical care for diseases in the field of otorhinolaryngology, head and neck surgery. By establishing evidence-based medicine (EBM) with case series studies and through collaborative research with basic science departments, we strive to identify the mechanisms of disease pathogenesis and to resolve issues directly related to the development of new treatment methods. These results are being shared with the rest of the world.

- Developing a system for diagnosing malignancy of parotid gland cancer: Aiming towards personalized treatment
- Investigating the mechanism of parotid gland cancer development using lipiodome analysis technology
- Examination of the efficacy of rehabilitation for facial palsy using laboratory animals
- Exosomes involved in intercellular signal transduction: analyzing the mechanism of immunotherapy

## Dentistry and Oral Surgery

### A Challenge to develop the world's most advanced medical materials and compilation of biomarkers

The Department of Dentistry and Oral Surgery conducts research that emerges from the small questions in clinical practice and the valuable needs in the clinical setting. Without losing sight of the small discoveries and inspirational ideas, we strive to develop the world's most advanced medical materials and compile biomarkers. This research is being conducted not only within Japan but also through collaboration with other universities overseas such as in Singapore and Canada.

- Development of a fully customized artificial tooth
- The pathogenic mechanism of lifestyle diseases and the gastrointestinal microbiome
- Establishing a functional assessment method for jawbone reconstruction
- Development of a titanium surface treatment method to optimize osteogenic activity

## Microbiology and Infection Control

### Pursuing relationships among microorganisms, humans, and the environment by both morphology and functional analysis

While specializing in ultrastructural morphology of microorganisms using traditional electron microscopy, we have also incorporated in recent years molecular biological and biochemical approaches to conduct analyses of bacteria, viruses, and not only to engage in research on the pathogenic microbes themselves, but also to elucidate host factors, as well as relationships among microorganisms, humans, and the environments.

- Ultrastructural analysis of microorganisms using electron microscopy
- Developing inhibitor screening systems against viral infections
- Identifying the relationship between bacterial and viral flora and systemic diseases
- Medical application of electrolysis (development of new disinfection methods, development of methods for inactivating medical wastewater)

## Legal Medicine

### Contributing to the safety of society through the fair and neutral use of science and technology

Since its inception, research at the Department of Legal Medicine has been based on genetic polymorphism and the practical applications of its findings. DNA analysis technology is now used for identification purposes during autopsies of solitary death cases and for the remains of the war dead. We are aiming to provide information that contributes to the safety of society through various techniques such as looking for biomarkers that indicate the cause of death using mass spectrometry and estimating the time since death using adipose-derived stem cells.

- Association between genetic analysis and metabolite fluctuation in sudden cardiac death
- In-vivo metabolite fluctuations in sudden death cases from psychotropic overdose
- Estimation of time since death using adipose-derived stem cells
- Regulation of inflammation by adipose-derived stem cells with enhanced ability to secrete cell growth factors

## Hygiene and Public Health I · II

### Promotion of preventive medicine to extend healthy life expectancy from a life course perspective

We study the association between oral microflora and pathological conditions and diseases that inhibit the extension of a healthy lifespan among the elderly, the relationship between the oral microflora of pregnant women and their pregnancy outcomes as well as the oral microflora formation in children. Exercise intervention studies of elderly people and regional correlation studies using bone fracture data are also ongoing. Through epidemiological studies, we strive to provide evidence that will contribute to extending healthy life expectancy.

- Cohort studies of community-dwelling residents (Epidemiological studies to prevent osteoporosis among women and elderly men, follow-up study to evaluate the effect of oral frail elderly residing in Takatsuki City)
- Cohort study on oral microflora of pregnant women and their children
- Intervention studies on exercise (interval walking) among community-dwelling elderly residents
- Research on the actual status of osteoporosis treatment using sources such as the national database (NDB) in Japan

# Master's Program in Medical Sciences

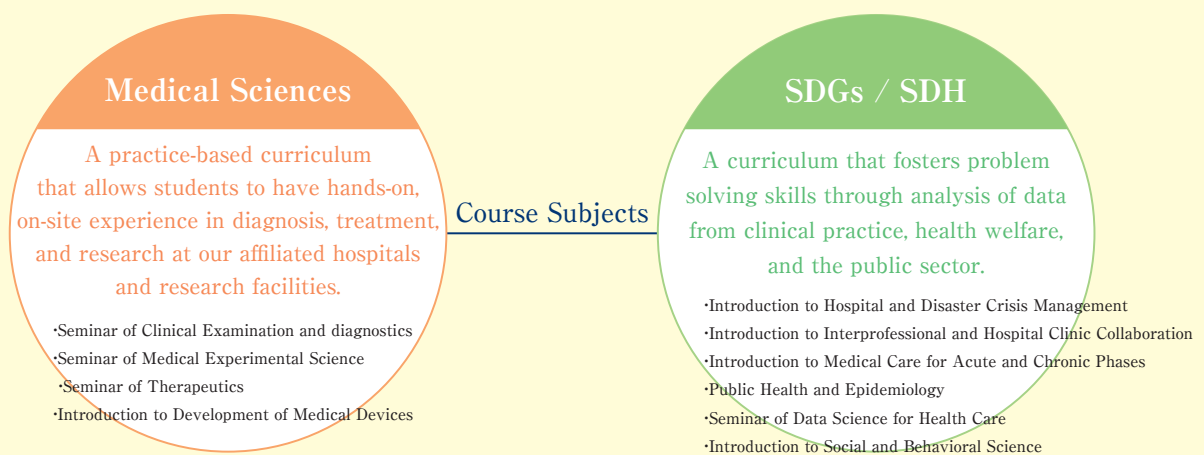
Two courses offered: “Medical Science Course” and “SDGs / SDH Course”

An Opportunity to acquire “knowledge in medicine and healthcare, and applying research methods in real practice” and “carving out various career paths” .

## Common Subjects

To acquire basic knowledge of medicine, subjects in the following fields are offered:  
basic medicine, clinical medicine, each area of social medicine and medical statistics. You can learn the basics of medicine.

- Introduction to Human Anatomy, Physiology, and Biochemistry
- Introduction to Pathology, Pharmacology, and Infection Control
- Introduction to Internal Medicine
- Introduction to Surgery
- Introduction to Comprehensive Medicine and Vital Care
- Introduction to Uro-Reproduction and Developmental Medicine
- Introduction to Medicine for Function and Morphology of Sensory Organs
- Fundamentals of Medical Statistics
- Fundamentals of Public Health



## Integrated Lectures

Attending lectures with students in the Doctorate (PhD) program (mostly medical doctors), and presenting to and discussing your research with other students and faculty members other than your direct supervisors will deepen your understanding of your own research and assist you in choosing your future research path.

## Master's Thesis Research

# Doctoral (PhD) Program in Medicine

5 course system to meet diverse needs.

Enable the development of extensive research and produce researchers and advanced medical personnel who have a broad spectrum of clinical competence in line with the goals.

- Preventive and Social Medical Research Course
- Life Science Research Course
- Advanced Medical Personnel Development Course
- Regenerative Medical Research Course
- Advanced Medical Research Course



## Graduate School of Medicine Department of Innovative Medicine

### Aiming at clinical application of chymase inhibitor

Chymase, was found as an angiotensin II-generating enzyme, has been shown to play an important role in the pathophysiology of various diseases aside from cardiovascular diseases. Chymase inhibitors are expected to work in myocardial infarction, cardiac failure, aortic aneurysms, renal failure, ulcerative colitis, pulmonary fibrosis, and postoperative adhesion. We conduct joint research on and off campus at clinical and basic departments together with companies to find clinical applications.

- Development of protease inhibitors (including chymase inhibitors)
- Development of artificial blood vessels targeted at lowering the stenosis rate
- Development of new drugs utilizing drug delivery systems
- Drug efficacy evaluation using pathological models

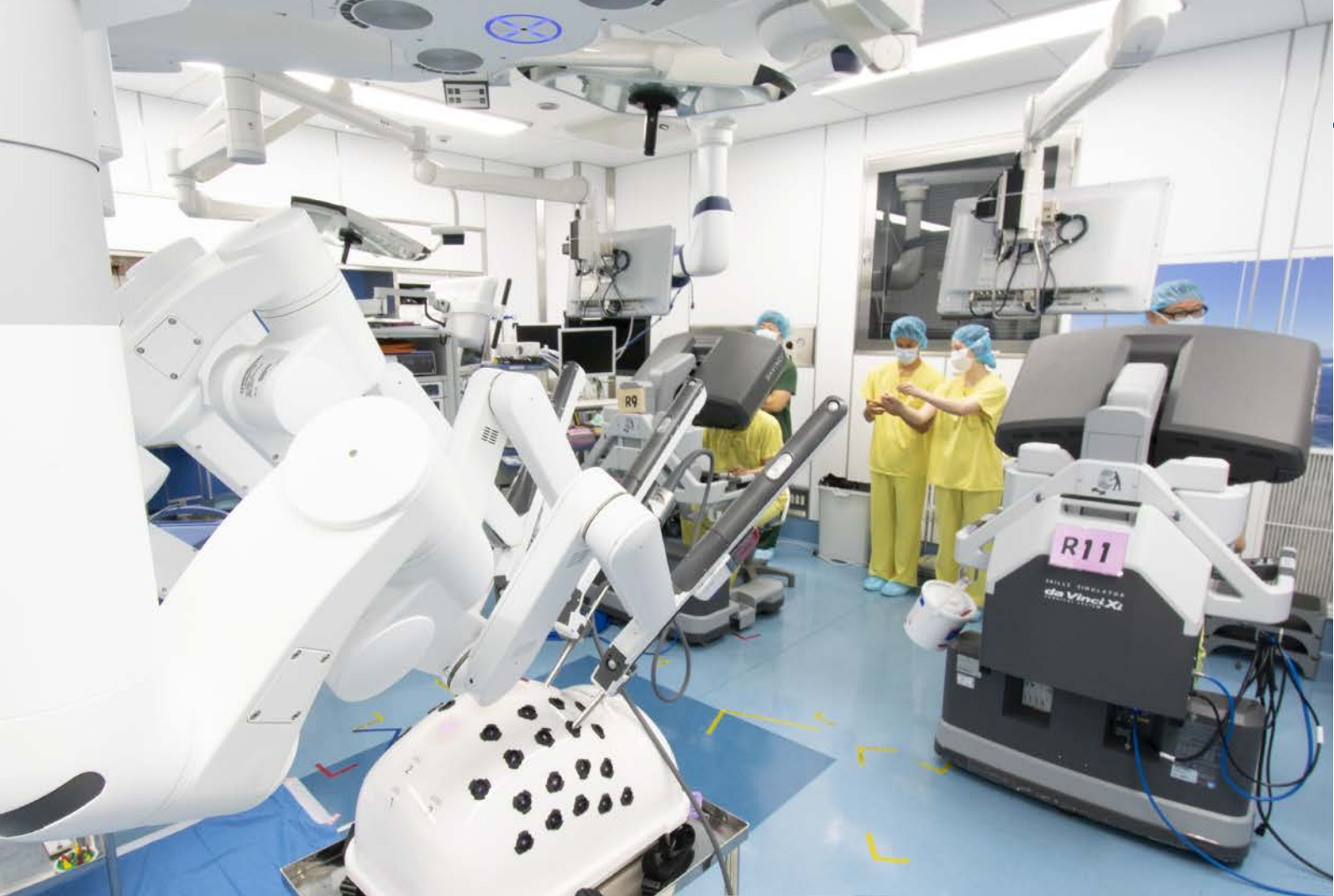
## Endowed Chair : Comprehensive Regional Medical Sciences / Department of General Medicine

Since 2014, the Department of General Medicine has been providing essential medical support to the region with generous financial backing from Hyogo and Kochi prefectures. Our primary mission is to enhance the overall health and well-being of the entire region by cultivating a cadre of medical professionals who possess the skills and knowledge necessary to make meaningful contributions to regional healthcare and promote research in this field.

We work closely with local residents, offering education and training to physicians and medical personnel involved in comprehensive medical care and regional healthcare, while simultaneously providing crucial medical support. Our department is responsible for diagnosing and treating patients suffering from unknown conditions referred from medical institutions throughout the Kansai region, with a focus on Takatsuki City. In addition, we take on the hospitalization and treatment of secondary emergency patients transported from the north area of Osaka prefecture.

We practice team medicine with medical students and trainees, which is one of the major pillars of medical education before and after graduation.

- Clarification of fever /Inflammation of unknown origin
- Motivational Search in Physicians' Altruistic Behavior and Its Application to Professionalism Education
- Exploring Factors Influencing the Choice of Specialization among Graduates of the "Regional Quota for Medical School" in Medical Schools
- Exploring the Impact of Regional Medical Training Programs for High School and Medical Students on the Participating Hospitals and Local Communities
- Research on Rehabilitation of Dementia



血

### 静脈洞閉塞症

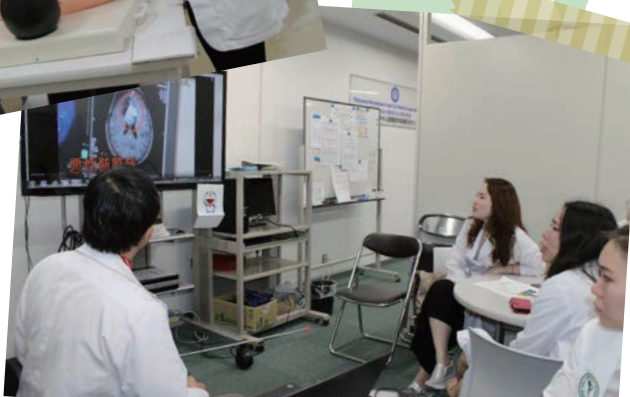
この図は、頭蓋内静脈の構造と、静脈洞閉塞症による静脈還流障害の発生メカニズムを示しています。静脈洞閉塞症は、うっ滞や脱水などが原因で、静脈管が破綻し、脳内出血や脳梗塞を引き起こす可能性があります。診断には造影CTや血管造影検査が行われます。

頭蓋内静脈の構造と、静脈洞閉塞症による静脈還流障害の発生メカニズムを示す図。静脈洞閉塞症は、うっ滞や脱水などが原因で、静脈管が破綻し、脳内出血や脳梗塞を引き起こす可能性があります。診断には造影CTや血管造影検査が行われます。



# International Exchange

At OMPU, there are consistently upheld the philosophy of providing education with a global mindset. We are deeply involved in international exchanges with universities, research institutions, and hospitals abroad through undergraduate student exchanges and academic exchanges of medical technology, research and collaborative academic work of graduate students and faculty members. Going beyond, we have also contributed to the international community through a wide range of activities such as through exchanges and cooperation with Japan International Cooperation Agency (JICA). Researchers are also given various opportunities to learn and are given financial support for studying abroad. Currently, we have signed international exchange agreements with 15 institutions abroad. Under international exchange agreements and through a counterpart system, we have been conducting study abroad programs with the following institutions: University of Hawaii (USA), Amur State Medical Academy (Russia), National University of Singapore, Seoul National University, The Catholic University of Korea, National Taiwan University, Taipei Medical University, Mahidol University (Thailand), Minnesota State University, Mankato. To further support the training of medical professionals with a global mindset, we will continue to promote resilient and sustainable international exchanges.



Amur State  
China Medical University (China)  
Japan-China Friendship Hospital (China)  
The Catholic University of Korea, Faculty of Medicine (Korea)  
Seoul National University, Faculty of Medicine (Korea)  
Vietnam National University, Hanoi (Vietnam)  
Bach Mai Hospital (Vietnam)  
Siriraj Hospital, Mahidol University (Thailand)  
National University of Singapore (Singapore)  
Taipei Medical  
National Taiwan  
Show Chwan  
Peking University S





Medical Academy (Russia)

Minnesota State University, Mankato

University (Taiwan)

an University (Taiwan)

Memorial Hospital (Taiwan)

Shenzhen Hospital (China)

University of Hawaii, Faculty of Medicine (United States Of America)





## Osaka Medical and Pharmaceutical University Hospital

As an "advanced treatment hospital", "disaster base hospital" and "locally based cancer care partnership hospital", Osaka Medical and Pharmaceutical University Hospital provides highly advanced medical treatment with its advanced clinical force and clinical application force. The hospital takes a proactive stance in supporting the regional medical service as the last stronghold of the region.

### Central Operating Room Building

As the core hospital in the region, over 10 thousand operations have been conducted on an annual basis with the implementation of leading-edge equipment and facilities such as hybrid operating room, endoscope, and robotic surgery rooms.



# University Hospitals





## Osaka Medical and Pharmaceutical University Mishima-Minami Hospital

The hospital practices regional medical care to create a bridge between "emergency, acute phase, convalescence phase, recuperation medical care" and home medical care.



## Kansai BNCT Medical Center

Foundation of Kansai BNCT Medical Center , the world's first shared BNCT specialized medical base, to put BNCT (Boron Neutron Capture Therapy) into practical use.



## Osaka Medical and Pharmaceutical University Health Science Clinic

With the medical education and clinical research that has been developed and fostered over many years as the base, the clinic works to find presymptomatic diseases and to extend healthy life expectancy.





# Osaka Medical and Pharmaceutical University

Faculties	Graduate Schools		
Faculty of Medicine Faculty of Pharmacy Faculty of Nursing	Graduate School of Medicine <ul style="list-style-type: none"><li>· Master's Program in Medical Sciences</li><li>· Doctoral Program in Medicine</li></ul>	Graduate School of Pharmaceutical Sciences <ul style="list-style-type: none"><li>· Doctoral Program in Pharmacy</li><li>· Master's Program in Pharmaceutical Sciences</li><li>· Doctoral Program in Pharmaceutical Sciences</li></ul>	Graduate School of Nursing <ul style="list-style-type: none"><li>· Master's Program in Nursing</li><li>· Doctoral Program in Nursing</li></ul>
■ Main Campus (Faculty of Medicine, University Hospital) 2-7 Daigakumachi, Takatsuki, Osaka	■ North Campus (Faculty of Nursing) 7-6 Hatchonishimachi, Takatsuki, Osaka	■ Abuyama Campus (Faculty of Pharmacy) 4-20-1 Nasahara, Takatsuki, Osaka	