星薬科大学大学院　薬学研究科　総合薬科学専攻　主な研究テーマ

Hoshi University Graduate School of Pharmaceutical Sciences
Division of Systematic Pharmaceutical and Life Sciences
Research theme

2026 年度秋入学～2027 年度春入学 学生募集用
For 2026 Autumn Semester and 2027 Spring Semester New Student

博士課程における５つの領域
① 基盤薬学領域
② 機能分子薬学領域
③ 創薬化学領域
④ 環境保健学領域
⑤ 医薬創成科学領域
⑥ データサイエンス領域

Five Areas in Doctoral Course Education (DCE)
① Fundamental Pharmaceutics Area
② Functional Molecular Pharmaceutics Area
③ Drug Discovery Chemistry Area
④ Environmental Health Science Area
⑤ Medicinal Innovation Science Area
⑥ Data Science Area

博士領域 DCE	研究分野 Field of Study	指導教員 Supervisor	研　究　テ　ー　マ Research theme
①	生　化　学 Biochemistry	東 伸昭 Higashi, Nobuaki 高橋勝彦 Takahashi, Katsuhiko	Our long-term goal is to provide novel therapeutic cues to treat inflammatory diseases, allergy, metastatic cancer, infectious diseases and metabolic syndrome by uncovering roles of glycoconjugates and Pin1 in the pathogenesis. Specific research targets are (1) discovery and optimization of inhibitors of heparanase, a heparan-sulfate degrading enzyme, toward future clinical applications to combat the above diseases, (2) placentation and Pin1, a phosphorylated peptide-specific prolyl isomerase as metabolic syndrome preventive target.
①	薬品分析化学 Analytical Chemistry	穐山　浩 Akiyama Hiroshi 岩崎 雄介 Iwasaki, Yusuke 伊藤里恵 Ito, Rie	Study on the development of analytical methods for glycosaminoglycans in biological sample and the dynamic analysis in pathological conditions. Study on the development of novel analytical methods of hazardous chemical substances (pesticide residue, veterinary medicine residue, allergen, cyanoglycosides, mycotoxin, etc.) in foods. Development of analytical methods for unapproved unlicensed drug in health foods. Study on evaluation of anti-glycation and anti-oxidation in food components. Design and prepare the material and functions of functional food and nutritional supplements, and develop new analytical methods.
①	組 織 再 生 学 Tissue Regeneration	笹津 備尚 Masanaho Sasatsu 廣瀬 農 Atsushi Hirose 高橋 万紀 Kazunori Takahashi	Our laboratory investigates the molecular mechanisms of connective tissue metabolism underlying functional changes in the skin, arteries, ligaments, and related tissues. We aim to advance tissue regeneration by regulating adult stem cell differentiation and improving connective tissue function, with the goal of developing novel strategies for anti-aging, disease prevention and treatment, and pharmaceutical innovation.

①	病 態 生 理 学 Department of Pathophysiology	清水 孝恒 Shimizu, Takatsune	・Development of novel therapeutic approaches for osteosarcoma by elucidating the molecular mechanisms underlying the tumor progression, metastasis, and therapeutic resistance ・Investigation of the organ damage and immune abnormalities associated with hyperthyroidism using Graves' disease model mice
①	薬動学 Pharmacokinetics	落合　和 Ochiai, Wataru 加藤　大雅 Kato, Hiromasa	The influence of drug administration during pregnancy evaluated from the pharmacokinetic analysis of embryo, Effect on differentiation of neural stem cells by medicine during developing brain, Study on zonation formation of drug-metabolizing enzyme in liver. Evaluation of the effects of renal dysfunction on skeletal muscle
①	臨床薬物動態学 Clinical Pharmacology and Pharmacokinetics	濱田 哲暢 Akinobu Hamada	Our laboratory is advancing research in pharmacokinetics and pharmacodynamics through collaborative studies with physicians and medical centers, aiming to realize Precision Medicine. In addition to conventional plasma drug concentration analyses, we incorporate drug imaging approaches that visualize drug distribution and pharmacological effects at the tissue and cellular levels, enabling a multifaceted evaluation of drug delivery and its effects. Using patient-derived specimens and clinical data, we conduct translational research with a focus on clinical application, including optimizing drug selection and dosing strategies and identifying biomarkers.
②	薬品物理化学 Physical Chemistry	大貫 義則 Onuki,Yoshinori 山下 雄史 Yamashita, Takefumi 井上 元基 Inoue, Motoki	Optimizing formulation and process parameters in pharmaceutical manufacturing. Characterization of the physicochemical properties of pharmaceuticals using NMR relaxometry. Supercomputer-aided molecular design for pharmaceuticals and formulations, as well as foundational theoretical research underlying these endeavors. Mechanistic elucidation of biomolecular functions through molecular dynamics simulations, quantum chemistry computations, and machine learning, advancing drug discovery and formulation endeavors. Crystalline form control for improvement the physicochemical properties of active pharmaceutical ingredients and development of spectroscopic methods. Process control for oral solid dosage forms. 2D and 3D formulation design using digital technology for the development of personalized formulation.
②	分 子 薬 剤 学 Molecular Pharmaceutics	服部 喜之 Hattori, Yoshiyuki 川野 久美 Kawano, Kumi 清水 涼平 Shimizu, Ryohei	Development of delivery systems for nucleic acid-based therapeutics
②	製 剤 設 計 学 Pharmaceutical Science and Technology	小幡 誉子 Obata, Yasuko	・Development of transdermal/cosmetic formulation based on nanostructure analysis of skin ・Development of a novel drug delivery system combining improved drug solubility and polymer carriers

③	薬品製造化学 Synthetic Medicinal Chemistry	杉田 和幸 Sugita, Kazuyuki 加茂 翔伍 Kamo, Shogo	Efficient total syntheses of natural products with complex structures. Syntheses of natural products that modulate protein–protein interactions aiming to develop medicines. Design, synthesis and evaluation of small molecules that modulate protein–protein interactions to develop new control methodology as a next–generation drug discovery technology. Development of new efficient reactions.
③	生体分子有機化学 Organic and Biomolecular Chemistry	叶 直樹 Kanoh, Naoki 池内 和忠 Ikeuchi, Kazutada	Our laboratory focuses on the following researches utilizing synthetic organic chemistry: (1) Design and synthesis of organic molecules that target disease-related biomolecules, (2) Mode-of-action analysis of bioactive small molecules using synthetic probes, (3) Development of reactions and methodologies for the synthesis of drug-like molecules having novel skeletons and reactivities, (4) Synthetic studies on bioactive natural products.
③	機能分子創成化学 Laboratory of Synthetic Biomolecular Chemistry	眞鍋 史乃 Manabe, Shino	Our aim is to expand organic chemistry to biopolymers, especially focused on glycoscience. Development of efficient glycosylation and synthesis of biologically active oligosaccharides Glycan-remodeling of glycoproteins Development of antibody-drug conjugates
③	合成化学 Green Pharmaceutical and Medicinal Chemistry	山内 貴靖 Yamauchi, Takayasu	Development of new ligands for drug discovery Total synthesis of natural products Environmentally friendly and efficient synthesis of heterocycles Efficient oxidation of alcohols with hypervalent iodine
③	生薬学 Pharmacognosy	森田 博史 Morita, Hiroshi 金田 利夫 Kaneda, Toshio	Research on the anti-cancer, anti-obesity, and anti-osteoporosis constituents from various foodstuffs and medicinal herbs. Isolation and structure determination of bioactive small molecules from medicinal plants. Research on the molecular mechanism underlying the biological activities of natural products.
④	微生物学 Microbiology	工藤 由起子 Kudo, Yukiko 築地 信 Tsuiji, Makoto 奥 輝明 Oku, Teruaki	Studies on methods for the detection and control of microorganisms, such as foodborne bacteria, to prevent health hazards, and on host defense mechanisms against microbial infection, including intercellular cooperation among immune cells, immunomodulatory agents, and interactions between bacterial toxins and the host immune system.

④	機能形態学 Physiology and Morphology	小林 恒雄 Kobayashi, Tsuneo 田口 久美子 Taguchi, Kumiko	Cardiovascular diseases such as atherosclerosis, hypertension, and diabetes mellitus (DM) represent one of the most important causes of morbidity and mortality in worldwide. Although vascular dysfunction including restricted relaxation and/or augmented contraction plays an important role in the development of cardiovascular diseases, detailed molecular mechanisms remain unclear. It is imperative that comprehensive understanding of mechanisms underlying vascular dysfunction in such diseases to prevent the development of disease-associated complications. For several years, our research has been focused on vascular function in cardiovascular diseases, especially DM (Type 1 and Type 2). Our current interests are 1) elucidation of molecular mechanism and/or signal-transduction in vascular function, 2) identification of therapeutic target against disease-associated vasculopathy, 3) definition of role of vascular as the network between vasculature and other organs in animal models of diseases by using pharmacological, physiological, and molecular biology techniques. We believe that our findings provide novel therapeutic targets for the prevention and treatment of cardiovascular diseases.
④	分子生物学 Molecular Biology and Physiology	千葉 義彦 Chiba, Yoshihiko	Mechanisms involved in the tissue hyperresponsiveness in allergic disorders.
④	運動科学 Sports Science	竹ノ谷 文子 Takenoya, Fumiko	Development of novel peptide-based exercise therapies. Establishment of evidence-based medical aromatherapy through molecular-level application of essential oils.
④	薬理学 Pharmacology	成田 年 Narita, Minoru 葛巻 直子 Kuzumaki, Naoko 濱田 祐輔 Hamada, Yusuke 須田 雪明 Suda, Yukari	By applying cutting-edge technologies, we aim to elucidate the mechanisms underlying higher brain functions, psychological disorders, pain, cancer, and aging, as well as to explore novel therapeutic strategies. Through the application of genetic engineering techniques, we artificially manipulate target neural network, and by employing cell sorting methods, we identify and analyze disease-specific cells for comprehensive trans-omics analysis. Furthermore, by inducing differentiation of patient-derived, disease-specific iPS cells into various human cell types and performing multiperspective analyses of cell–cell interactions, we seek to establish novel therapeutic algorithms for intractable diseases such as cancer, neurodegenerative disorders, and psychiatric illnesses.
④	薬物治療学 Pathophysiology and Therapeutics	池田 弘子 Ikeda, Hiroko	Research to investigate the mechanisms how the central nervous system regulates the energy homeostasis such as food intake and blood glucose levels, in the purpose of treating obesity and diabetes. Research to investigate the mechanisms how metabolic syndrome such as diabetes and obesity affects the peripheral and central nervous systems.

④	環境衛生化学 Environmental Health Sciences	戸塚 ゆ加里 Totsuka, Yukari 今井 正彦 Imai, Masahiko 長谷川 晋也 Hasegawa, Shinya	Exposure to environmental chemicals causes various diseases, including cancer. The Laboratories of Environmental Health Sciences is conducting research to elucidate the mechanisms of cancer development caused by environmental factors and inflammation, and develop preventive strategies based on these findings. Research is carried out using a wide range of methods, including genotoxicity assessment using bacteria, cultured cells and laboratory animals, comprehensive analytical methods for DNA damage/genome mutations, and gene expression analysis. In addition, the development of methods utilizing bio-mimetic mini-organs (organoids) as an alternative method for the safety evaluation of chemical substances with an awareness of the 3Rs (Replacement, Reduction and Refinement) of animal experiments is also being addressed.
④	薬学臨床教育評価学 Evaluation of pharmaceutical, clinical, and educational researches	山崎 正博 Masahiro Yamasaki	(1) Study of the effects of lipid-ketone body metabolism on malignancy of obesity (2) Study of brominated flame retardants, an environmental pollutant, on metabolic systems in lipogenic organisms
		井上 信宏 Nobuhiro Inoue	(3) Search for psychological factors providing learning behavior and development of educational method conduce to behavioral changes
④	医 療 薬 学 Clinical Pharmaceutical Sciences	野村 幸世 Nomura, Sachiyo 五十嵐 信智 Ikarashi, Nobutomo 今 理紗子 Kon, Risako 杉山 暁 Sugiyama, Akira	1. Long time goal of our department is to develop new therapeutics against incurable cancer, through pathological elucidation, immunological analysis, and analysis of the involvement of the mind and immune system, focusing on gastric cancer mouse models. In addition, we will elucidate the mechanism of gastric cancer development and develop methods to prevent gastric cancer. 2. In this laboratory, research is primarily focused on developing cancer therapies using antibody mimetic-based drug delivery systems. In parallel, efforts are also made to explore combinations of targets and payloads to create novel treatments for non-cancer diseases, with the goal of translating these discoveries into clinical and practical applications. 3. We aim to elucidate the role of gut microbiota alterations in disease onset and their underlying molecular mechanisms to develop novel preventive and therapeutic strategies targeting the gut microbiota. 4. We aim to scientifically evaluate the efficacy and safety of Kampo medicines, functional foods, and cosmetics, with the goal of establishing evidence for their appropriate use and developing novel applications. 5. We aim to elucidate the novel functions and pathophysiological roles of aquaporins, water channel proteins, and to develop new therapeutic strategies for diseases based on these findings.
④	行動可塑性制御 Mechanistic Control of Behavioral Plasticity	森 友久 Mori, Tomohisa	Results from animal models of psychiatric disorders, such as drug dependence, as well as perspectives on protein-protein interactions and organelle dysfunction in animals and neuronal cells, reveal the underlying mechanisms of these uncontrollable disorders.

④	毒　性　学 Toxicology	小川 久美子 Ogawa, Kumiko 酒井 寛泰 Sakai, Hiroyasu	We are conducting comprehensive analysis of toxicity induced by environmental chemicals, emerging chemical substances, and pharmaceuticals, primarily through *in vivo* studies complemented by *in vitro* approaches. Based on these findings, we aim to establish toxicity risk assessment methods and develop effective strategies for the prevention and mitigation of toxicity.
④	医療コミュニケーション学 Medical Communication	横田 理恵 Yokota, Rie	Our laboratory conducts research based on the biopsychosocial model, which emphasizes not only the biological aspects of disease but also patients' emotions, social roles, and lived experiences, moving beyond the traditional biomedical model. We explore a wide range of topics related to health communication, health behavior, and mental health. Our research areas include: (1) patient–healthcare provider relationships; (2) mutual understanding between patients and healthcare providers, such as the mental health and health behaviors of patients with stigmatized illnesses; (3) medical and health information encountered by patients and the public, including the evaluation of educational materials and online health information on platforms such as X (formerly Twitter); (4) strategies to promote healthy behaviors through effective messaging; (5) health education; (6) risk management; and (7) mental health. Through interdisciplinary approaches, we aim to contribute to patient-centered healthcare and the improvement of health communication in society.
④	臨床疫学 Clinical Epidemioligy	寺門 浩之 Terakado, Hiroyuki	Outcome evaluation of pharmacists in team medical care
		須永 登美子 Sunaga, Tomiko	Assessment of potentially inappropriate medications in patients with heart failure
		渡部 智文 Watanabe, Tomofumi	Evaluation of Pharmacist Outcomes in Oncology
	臨床薬学 Healthcare Innovation	湧井 宣行 Wakui, Nobuyuki	Verification of preventive effect on lifestyle-related diseases by using nutrition labeling
	臨床評価学 Clinical Pharmacy Assessment	佐野 元彦 Motohiko Sano	Assessment of symptoms and adverse events in patients with cancer
		石村 淳 Atsushi Ishimura	Therapeutic outcomes research in diabetes and health economics
		篠木 真帆 Maho Shinogi	Developing standards for drug use in sports that balance safety and fairness
⑤	生 物 制 御 科 学 Bioregulatory Science	細江 智夫 Hosoe, Tomoo 若菜 大悟 Wakana, Daigo	We are working about metabolic ability of microorganisms. Our recent research subjects are as follows: #1 Study on metabolism of plant alkaloids by microorganisms. #2 Study on the effect of Kampo medicines on fungal secondary metabolites. #3 Study on production of bioactive compounds using plant endophytes. Our goal is to make cheap and good medicines using microorganisms.

⑤	先端生命科学 Advanced Life Sciences	大竹 史明 Ohtake, Fumiaki	We focus on the mechanism controlled by the “ubiquitin system” involved in various diseases such as cancer and inflammatory diseases. Our study aims to elucidate the mechanism of “targeted protein degradation” and provide the molecular basis for new therapeutic strategies by degrading disease-causing proteins.
		竹島 秀幸 Takeshima, Hideyuki 日野原 邦彦 Hinohara, Kunihiko	We aim at developing novel cancer risk diagnosis and therapy based on epigenetic alterations (Methylation synthetic lethality, epigenome ADC). Also, we aim at revealing resistant mechanisms of anti-cancer drugs using epigenome editing and DNA barcoding technologies.
		田村 英紀 Tamura, Hideki	The major goal of our research is to uncover the molecular and cellular mechanisms underlying learning, memory, fear, anxiety, and stress. We use optogenetics, fiber photometry, patch clamp, fluorescence *in situ* hybridization, and behavioral techniques to elucidate the dynamics of neuromodulation of specific, behaviorally relevant neural circuits.
⑥	医療データサイエンス学 Medical Data Science	児玉 耕太 Kodama, Kota 小林 由幸 Kobayashi, Yoshiyuki 蔭山 逸行 Kageyama, Itsuki	We use data sciences as AI, bio-chemo-informatics, technology management, health economics and information, ergonomics, to study issues related to health care, life science and wellbeing in the broad sense of the term.