

Graduate School of Comprehensive Human Sciences

Degree Programs in Comprehensive Human Sciences

Choose your prospective research fields from the list below and write the names in the “Prospective research fields (supervisors)” section on the application form. You can choose up to two research fields. As a general rule, you will be assigned to a research group during the process of selecting students for admission, so please choose carefully. It is hard to determine the exact details of your prospective group’s research solely from the research themes listed below. To avoid writing your master’s thesis on a different research topic from the one you had in mind, be sure to contact the supervisor in the field of your choice. Also, if you have any questions, please consult with the following person about your choice.

For guidance, contact:

【Master’s Program in Medical Sciences】 Irie Kenji, Chair, Master’s Program in Medical Sciences, Graduate School of Comprehensive Human Sciences, University of Tsukuba

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●**Master’s Program in Medical Sciences** Page.1~Page.16

●**Master’s Program in Public Health** Page.17~Page.18

〈Master’s Program in Medical Sciences〉

Medical Sciences Basic Medicine		
Research Area	Faculty	Research
Anatomy and Embryology	高橋 智 TAKAHASHI Satoru	①Elucidation of molecular mechanism of pancreatic beta cell development and its application. ②Functional analysis of large Maf transcription factor family, MafB and c-Maf in macrophage development and functions. ③Elucidating biological roles of carbohydrates using glycosyltransferase conditional KO mice. ④Study of diseases and drug discovery by development of novel imaging system. ⑤Elucidation of etiology and gene function in disease model mice.
Anatomy and Neuroscience	武井 陽介 TAKEI Yosuke	①Animal model studies on synaptic dysfunction in schizophrenia and autism. ②Cell-biological studies on synaptic dysfunction in schizophrenia and autism. ③Studies on synaptic dysfunction caused by inflammation. ④Studies on intracellular transport in neurons and glia.

Neurobiology	()	<ul style="list-style-type: none"> ①Roles of monoamines in the synapse formation ②Effects of environmental factors on the development of brain and behavior ③Effects of gravitational stress on the brain ④Functional analyses of novel candidate genes involved in axonal guidance ⑤Analyses of neurodegenerative diseases at a molecular level
Diagnostic Pathology	<p>松原 大祐 MATSUBARA Daisuke</p>	<ul style="list-style-type: none"> ①Search for molecular targets of cancer, based on molecular markers and histomorphology, using surgical specimens and cell lines. ②Elucidation of the molecular mechanism of abnormal differentiation (dedifferentiation, neuroendocrine differentiation, EMT, gastrointestinal epithelial differentiation, etc.) in lung cancer. ③Study of drug sensitivity and resistance acquisition mechanism using cancer cell lines.
Experimental Pathology	<p>加藤 光保 KATO Mitsuyasu</p>	<ul style="list-style-type: none"> ①Molecular mechanisms of stemness induction in cancer development ②Cell division kinetics of cancer stem cells by application of live imaging and three-dimensional quantitative analysis
Systems Neuroscience	()	<ul style="list-style-type: none"> ①Brain information processing mechanism of motivation and reward expectancy ②Research on reinforcement learning and decision-making mechanism in the brain ③Research on information coding mechanism of reward value in the brain ④Research on visual recognition mechanism in the brain
Cognitive and Behavioral Neuroscience	<p>松本 正幸 MATSUMOTO Masayuki</p>	<ul style="list-style-type: none"> ①Roles of monoamine systems in cognitive, emotional and motivational brain functions ②Brain mechanisms underlying value-based decision making
Neurophysiology	<p>小金澤 禎史 KOGANEZAWA Tadachika</p>	<ul style="list-style-type: none"> ①Study on the neural regulation of the cardiovascular system ②Study on the neural regulation of the respiratory system ③Study on the neural regulation based cardiovascular and respiratory diseases
Biochemistry , Molecular Cell Biology	<p>入江 賢児 IRIE Kenji</p>	<ul style="list-style-type: none"> ①Post-transcriptional regulation of gene expression by RNA-binding proteins ②Molecular mechanism of mRNA localization and local translation regulating cell polarity, asymmetric cell division, and cell-fate ③Regulation of endoplasmic reticulum stress response ④Prosopore membrane formation by vesicle docking

Molecular and Developmental Biology	小林 麻己人 KOBAYASHI Makoto	①Development of hematopoietic stem cells ②Dietary antioxidants and lactic acid bacteria ③Defence systems against stresses ④Non-mammalian models of human diseases (zebrafish, African turquoise killifish)
Biochemistry , Gene Regulation	久武 幸司 HISATAKE Koji	①Molecular mechanisms of iPS cell induction ②Mechanisms of adipocyte and chondrocyte differentiation ③Molecular basis of epigenetics ④Chromatin modifications and transcriptional regulation
Cellular and Physiological Biology	大林 典彦 OHBAYASHI Norihiko	①Physiological functions of the small G proteins: Rab and Arf ②Membrane dynamics research aiming at invasion/metastasis, vascularization and pigmentation
Molecular Neurobiology	榊 正幸 MASU Masayuki	①Molecular studies on neural development and neural circuit formation ②Molecular studies on signal transduction in the nervous system ③Molecular studies on heparan sulfate in neural function ④Development and function of the corticospinal tract ⑤Regulatory mechanism of spinal motor nerve development
Infection Biology (Molecular Virology)	川口 敦史 KAWAGUCHI Atsushi	①Molecular mechanism of virus replication , species specificity and pathogenicity of emerging viruses including influenza virus ②Molecular mechanism of innate immunity
Infection Biology (Bacteriology)	森川 一也 MORIKAWA Kazuya	①Infection strategies in pathogenic bacteria ②Adaptation and evolution of staphylococci
Infection Biology (Molecular Parasitology)	HO, KIONG	①Understanding the mechanism of gene expression in protozoan parasites with a goal in identifying parasite-specific processes that can be exploited as targets for novel therapeutic interventions. ②Mechanism of mRNA recapping pathway in regulating gene expression. ③RNA repair - understanding of the function and mechanism behind cellular responses to RNA damage.
Immunology	渋谷 和子 SHIBUYA Kazuko	①To reveal host defense mechanisms against cancer and infectious diseases, and to develop their therapeutic manipulation ②To reveal cellular and molecular basis of allergy and autoimmune diseases, and to develop their therapeutic manipulation

Medical Genetics	野口 恵美子 NOGUCHI Emiko	①Identification of the susceptible genes related to allergic diseases ②Genetic analysis using next generation sequencer ③Functional studies of genes involved in allergy.
Molecular and Genetic Epidemiology	土屋 尚之 TSUCHIYA Naoyuki	①Identification of genomic variants associated with susceptibility and clinical characteristics of human autoimmune rheumatic diseases such as systemic lupus erythematosus, ANCA associated vasculitis, and systemic sclerosis. ②Molecular mechanisms of <i>HLA</i> and other genes associated with autoimmune rheumatic diseases
Genome Biology	村谷 匡史 MURATANI Masafumi	①Integrative genome and epigenome analysis of clinical samples to understand mechanisms of cancer development and for discovery of new drug targets and biomarkers. ②Cell-free DNA and RNA profiling to monitor environmental stress responses in internal tissues.
Regenerative Medicine and Stem Cell Biology	大根田 修 OHNEDA Osamu	①Development of Stem Cell Therapy using Mesenchymal Stem Cells ②Functional Analysis of Hypoxia Inducible Transcription Factors in vivo ③Analysis of Cancer Stem Cells and Tumor Stromal Cells
Stem Cell Biology and Biotechnology	西村 健 NISHIMURA Ken	①Functional analysis of transcription factors during cell reprogramming ②Epigenetic regulation during cell reprogramming ③Safe and efficient production of differentiated tissue cells
Laboratory Animal Science	杉山 文博 SUGIYAMA Fumihiro	①Development of new technology for producing genetically modified mice. ②Development of genetically modified mice for analyzing biological function ③Investigating the novel gene function in germ cell maintenance and maturation.
Bioinformatics	尾崎 遼 OZAKI Haruka	①Development of technologies to interpret and predict the function of genome sequences: genome (DNA), transcripts (RNA) and AI ②Development of single-cell level omics data analysis techniques: scRNA-seq and spatial transcriptome ③Automation of life science research: automation of experiment planning, experiment execution, and data analysis ④Medical data analysis: Large-scale databases such as hospital data and cohorts, databases
In silico Drug Design and Chemical Biology	広川 貴次 Hirokawa Takatsugu	①In silico drug discovery using molecular modeling and simulation ②Development of the methods based on bio-chem informatics for in silico drug discovery and design

Stem Cell Therapy	山崎 聡 YAMAZAKI Satoshi	①Development of advanced therapeutic technology using stem cells ②Cell reprogramming mechanism using nuclear transplantation technology ③Development of xeno chimeric animals using early developmental embryos
Medical Physics	榮 武二 SAKAE Takeji	①Development of techniques for high precision proton therapy ②Development of dose calculation system for neutron capture therapy ③Application of techniques for photon therapy ④Quality assurance of radiation therapy ⑤Development of new techniques for radiation measurement ⑥Study for radiation protection ⑦Basic research for acquiring information of biological function with image diagnostic techniques
Environmental Biology	()	①Adaptive response to electrophilic stress ②Reactive sulfur species as a regulator molecule for electrophilic stress
Molecular Biology	深水 昭吉 FUKAMIZU Akiyoshi	① Metabolism and methylation-regulated aging and longevity (cultured cells・C. elegans) ② Discovery of new methyltransferases and demethyltransferases, and its biological significance (cells・C. elegans・genetic model mice)
Developmental Genetics	丹羽 隆介 NIWA Ryusuke	①Mechanisms of interorgan communication in the regulation of development, energy metabolism, stem cell proliferation and environmental tolerance ②Molecular, cellular, and systemic mechanisms of the interaction between insects and parasitoid wasps ③Structural Biology and Chemical Biology of Insect Growth Control Agents
Biomaterials Science	長崎 幸夫 NAGASAKI Yukio	①Design of Nanomedicine ②Design of Drug Delivery System ③Design of Materials for Degenerative Medicine ④Design of Biointerfaces
International Institute for Integrative Sleep Medicine (WPI-IIS) Yanagisawa/Funato Laboratory	柳沢 正史 YANAGISAWA Masashi	Our lab aims at solving the mystery of sleep ①Elucidation of the molecular mechanism regulating sleep/wakefulness through a forward genetic approach ②Medicinal chemistry to develop new drug for sleep disorder ③Visualization of neural and glial cell activity during sleep/wakefulness behavior

International Institute for Integrative Sleep Medicine (WPI-IIIIS) Kutsumura/Saitoh Laboratory	沓村 憲樹 KUTSUMURA Noriki	<ul style="list-style-type: none"> •Orexin receptor selective agonist/antagonist •Opioid receptor selective agonist/antagonist <p>Through development such ligands shown above, we aim to create narcolepsy therapeutics, analgesics, and antidepressants, etc. Not only synthesis of compounds but also pharmacological evaluation (in vitro and in vivo) are performed.</p> <p>New drug creation by clarification of plasticity in the central nervous system and change of emotional brain function induced by stress, chronic pain and drugs of abuse.</p>
	齊藤 毅 SAITOH Tsuyoshi	<p>We aim at creating innovative molecules contributing to biomedical sciences, such as:</p> <ol style="list-style-type: none"> ①Drugs targeting GPCRs for the treatment of insomnia, narcolepsy, pain, and mental disorders (drug design, synthesis, pharmacology) ②Novel chemical probes to visualize biological functions ③Opto-pharmacological probes for the flexible control of drug function ④New chemical reactions using electron and photon as external energy.
International Institute for Integrative Sleep Medicine (WPI-IIIIS) Sakurai/Hirano Laboratory	櫻井 武 SAKURAI Takeshi	<ol style="list-style-type: none"> ①Elucidation of physiological roles of novel neuropeptide ②Revealing the neural circuits and neural mechanisms that work in the system that regulates emotion. ③Studies on the neural circuits and neural mechanisms that play roles in the regulation of sleep/wakefulness states. ④Elucidation of neural circuits and mechanisms by which body temperature and metabolisms are regulated.
	平野 有沙 HIRANO Arisa	<ol style="list-style-type: none"> ①Research on oscillatory mechanism of the circadian clock and the effect of disrupted rhythms on mice. ②Elucidation of molecular mechanism of phase-resetting of the circadian clock and circadian photo-reception. ③Identification and functional analysis of neural circuits regulating the circadian rhythms. ④Development of optogenetics tools.
	征矢 晋吾 SOYA Shingo	<ol style="list-style-type: none"> ①Elucidation of neural mechanisms of social distance and behavior ②Uncovering how neuropeptide affects the emotion. ③Revealing the neural circuits that regulate thermal and metabolic regulation in exercise-induced fatigue.
International Institute for Integrative Sleep Medicine (WPI-IIIIS) Greene/Vogt Laboratory	VOGT Kasper Manuel	<ul style="list-style-type: none"> • Measuring and understanding brain activity in waking and sleep • Determine the effect of sleep on brain circuits • Discover the control mechanisms for sleep depth • Develop new technologies and mathematical tools to study sleep function

International Institute for Integrative Sleep Medicine (WPI-IIS) Sakaguchi Laboratory	坂口 昌徳 SAKAGUCHI Masanori	①Function of sleep in memory consolidation ②Adult neurogenesis ③Imaging and optogenetic analysis of hippocampal neurons https://sakaguchi-lab.org/
International Institute for Integrative Sleep Medicine (WPI-IIS) Lazarus/Oishi Laboratory	LAZARUS Michael	①Understanding the link between sleepiness and motivation by exploring mesolimbic glia-neuron interactions ②Sleep circuits as potential therapeutic targets for insomnia ③Exploring the anti-psychotic effects of hyperadenosinergic activity ④Single-cell gene expression analysis of crosstalk between sleep and immune system https://www.wpiiiislazaruslab.org/
	大石 陽 OISHI Yo	① Sleep regulation by dopamine-related neural circuits ② Production and analysis of short-sleeper mice ③ Relationship between anti-histamine and sleepiness
International Institute for Integrative Sleep Medicine (WPI-IIS) Honjoh Laboratory	本城 咲季子 HONJOH Sakiko	①The dynamics of thalamocortical system across sleep/wake cycles ②Elucidation of neural circuits underlying NREM sleep specific EEG patterns ③Analysis of vigilance state-dependent transcriptional changes ④Elucidation of the function of vigilance-state specific genes in neural activity
International Institute for Integrative Sleep Medicine (WPI-IIS) Abe Laboratory	阿部 高志 ABE Takashi	①Functional roles of human sleep ②Neurobehavioral consequences of sleep deprivation ③Development of non-invasive methods to improve human sleep ④Development of new methods to evaluate human sleep and wakefulness
Brain Maturation/ Evolution	()	①Elucidation of the function of sleep focusing on brain maturation and aging ②Elucidation of the evolutionary process of sleep based on molecular and developmental approaches
Molecular Circuits of RNAi, Sleep, and Fear	()	①Comprehensive understanding of the molecular and neural bases for sleep drive ②Elucidation of the molecular and neural bases for fear and sexual behaviors
Occupational Psychiatry / Space Psychiatry	松崎 一葉 MATSUZAKI Ichiyo	①A study of the strong qualities unexpectedly in space ②Salutogenesis and Sense of coherence ③Nature based Rehabilitation

Vascular Matrix Biology (TARA Center)	柳沢 裕美 YANAGISAWA Hiromi	①Identification and functional analysis of novel extracellular matrix proteins in the vessel wall ②Molecular mechanism of aortic aneurysm formation and rupture ③Mechanotransduction in the vessel wall ④Characterization of niche matrix associated with epidermal stem cells
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Clinical Medicine		
Research Area	Faculty	Research
Nephrology	山縣 邦弘 YAMAGATA Kunihiro	①Mechanism of chronic progressive kidney diseases ②Method of early diagnosis and prevention of kidney diseases ③Approach to treatment of progressive kidney diseases ④Epidemiology of acute kidney injury and chronic kidney disease ⑤Outcome research of lifestyle diseases
Clinical Immunology and Rheumatology	()	①Molecular mechanism in autoimmune diseases such as rheumatoid arthritis and connective tissue diseases ②Specific regulation of autoimmune diseases ③Approach to genetic therapy and disease-specific iPS cells therapy in autoimmune diseases
Hematology	千葉 滋 CHIBA Shigeru	①Mechanism of leukemo/lymphomagenesis ②Mechanism of bone marrow failure ③Translational research on stem cell therapy ④Laboratory hematology for hematopoietic disorders
Gastroenterology	土屋 輝一郎 TSUCHIYA Kiichiro	①Basic research about pathogenesis of intestinal epithelial cells in inflammatory bowel disease ②Basic research about pathogenesis of inflammatory bowel disease related carcinogenesis
Pulmonary Medicine	檜澤 伸之 HIZAWA Nobuyuki	①Molecular genetics of chronic inflammatory lung diseases including asthma and COPD ②Role of genetics and environmental factors in allergic diseases ③Study of interactions between genetics and environment in respiratory diseases
Pulmonary Medicine Pulmonary Medicine, Infection, and Allergy	佐藤 浩昭 SATOHI Hiroaki	①Study of chemotherapy for lung cancer ②Clinical application of carbohydrate antigens for respiratory diseases ③Optimal therapeutic strategy development for lung cancer in the elderly
	石井 幸雄 ISHII Yukio	①Elucidation of cellular and molecular mechanisms of pulmonary host responses to environmental stimuli, including cigarette smoke, antigens, chemical carcinogens, and microorganisms. ②Exploring the bio-markers in inflammatory and allergic lung diseases.
Cardiology	家田 真樹 IEDA Masaki	①Cardiac regeneration and translational research ②Reprogramming to generate cardiomyocytes ③Molecular mechanism and new therapy for cardiovascular diseases

Cardiology	宮内 卓 本間 覚 MIYAUCHI Takashi HONMA Satoshi	①Establishment of mechanism and treatment of arrhythmia ②Establishment of evaluation of hemodynamics ③Establishment of new treatment strategy of heart failure ④Relation between arteriosclerosis and endothelial function ⑤Medical quality assurance and risk management
Metabolism and Endocrinology	島野 仁 SHIMANO Hitoshi	①Molecular mechanism of obesity, diabetes, dyslipidemia, and atherosclerosis ②Physiology and pathophysiology of transcription factors involved in the metabolism of carbohydrate and lipid ③Sensing mechanism and transcriptional regulation of energy metabolism ④Hub-metabolites and epigenetic regulation in carbohydrate, lipid, and protein metabolism ⑤Quality aspect of fatty acids and physiology and pathophysiology of various organs ⑥Molecular visualization at organelle level and synthetic biology ⑦Inhibition of cholesterol synthesis, myopathy, and brain dysfunction
Lipid Medicine	松坂 賢 MATSUZAKA Takashi	①Role of fatty acid elongase Elovl6 in metabolic syndrome ②Role of Elovl6 in brain, neurodegenerative disease and sphingolipidosis ③Role of Elovl6 in cancer and stem cell ④The structural basis of Elovl6 ⑤Development of the new Elovl6 inhibitor
Infectious Diseases	人見 重美 HITOMI Shigemi	①Epidemiological investigation of serious infectious diseases and HIV infection. ②Molecular investigation of pathogenic and drug-resistant factors of microorganisms. ③Evaluation of precautions against transmissible infectious diseases. ④Clinical studies among patients with infectious diseases
Neurology	()	①Molecular pathogenesis of Alzheimer's disease ②Pathology and biochemistry of neuromuscular disorders ③Neurobiology of neurodegenerative disorders ④Neuro-ophthalmology of neurological disorders ⑤Clinical and epidemiological studies of organoarsenic intoxication
General Thoracic Surgery	佐藤 幸夫 SATOH Yukio	This course is programmed to investigate on 1) minimal invasive thoracoscopic surgery for lung cancer, 2) angiogenesis and invasion of lung cancer, 3) leukocytes-endothelial interaction in acute lung injury, 4) novel sealant material for surgery, 5) screening of lung cancer with exhaled breath and 6) surgical simulation, and estimation of postoperative lung regeneration and function using 3D-CT.

Cardiovascular Surgery	平松 祐司 HIRAMATSU Yuji	<ul style="list-style-type: none"> ①Development of novel microangiography system using synchrotron radiation ②Elucidation of signal transduction in aneurysmal formation ③Elucidation of hematological deterioration during cardiopulmonary bypass ④Study of ischemic myocardial remodeling using knockout mice ⑤Development of novel tissue crosslinking treatment technology ⑥Development of vitamin K-reduced functional food ⑦Development of valve simulation technology ⑧Exploration of valve-sparing right ventricular outflow reconstruction ⑨Study in rehabilitation medicine in reduced venous return ⑩Regulation of gaseous microemboli in cardiopulmonary bypass ⑪Regenerative medicine using stem cells ⑫Production of 3D heart replicas
	鈴木 保之 SUZUKI Yasuyuki	<ul style="list-style-type: none"> ①Development of new surgical procedure about congenital cardiac surgery ②Development of cardiac assist device using artificial muscle ③Elucidation of hematological deterioration during cardiopulmonary bypass ④Development of the new regenerative therapy using intraoral mesenchyma system cells
Pediatric Surgery	増本 幸二 MASUMOTO Koji	<ul style="list-style-type: none"> ①Bioengineered tissue transfer in infants and children ②Studies related to carcinogenesis and progression of malignant solid tumors in children ③Pathological, molecular biological and genetic studies of the alimentary tract malformations ④Studies of treatment for hypoplastic lungs in congenital diaphragmatic hernia
Organ Transplantation, Gastroenterological and Hepatobiliary Surgery	()	<ul style="list-style-type: none"> ①Platelet and regenerative medicine: To clarify the mechanisms of liver regeneration by platelet function and aging platelet. ②Drug delivery system : To investigate the mechanisms of liver injury and to develop a method of prevention by the use of a novel DDS. ③Surgical metabolism and wound healing: To develop a novel treatment for minimizing intestinal damage under surgical stress. ④Multipotential stem cells and regenerative medicine: To develop a gastroenterological tissue or organ bud in micro-environment with placental or/and other tissue derived stem cells for transplantation trials. ⑤CancerComprehensive elucidation of cancer genesis and metastasis by analyzing cancer stem cells, local microenvironment (incl. fibroblast and platelets), and

		<p>niche in metastatic site (liver Kuppfer cells, platelets). Paying special interest on cancer specific glyco-proteins, which will confer bran-new therapeutic strategy that specifically target cancers by glycan-lectin interaction: ⑥ Computer assisted Surgery (CAS): To develop and apply the system of the CAS and the novel surgical education system through the medical-engineering collaboration.</p>
Neurosurgery	<p>松丸 祐司 MATSUMARU Yuji</p>	<p>① Neurooncology ①-1 Neurooncology(Advanced Therapeutics): Boron neutron capture therapy(BNCT), Proton therapy, Tumor vaccination, Gene thrapy, Photodynamic diagnosis and treatment (PDD, PDT) ①-2 Neurooncology(Diagnostics): Molecular maker and gene analysis of brain tumor(glioma, pediatric brain tumor, craniopharyngioma), Intraoperative neurophysiological monitoring (MEP, SEP, EEG), Imaging study(Intraoperative MRI, Tractography, PET) ② Cerebrovascular disease: Neuroprotection using nanoparticle and stem cell therapy for ischemic stroke. Prevention of carotid artery restenosis. Evaluation of oxidative stress in brain. Regenerative Medicine using dental pulp stem cells ③ Analysis of cerebral function, perfusion and metabolism using neuroimaging (functional -MRI, MR spectroscopy, diffusion tensor imaging, PET) ④ Neurorehabilitation using Robot Suit HAL, Brain machine interface ⑤ Functional neurosurgery for epilepsy, involuntary movement, central pain and Headache ⑥ Gene therapy and regeneration therapy using DDS (Angiogenesis, bone regeneration) ⑦ Pediatric Neurosurgery: Epigenetic biomarkers from woman with neural tube defect affected pregnancies ⑧ Development of advanced medical equipment and device (laser endoscope, new device of endoscopic surgery) ⑨ Neuroendovascular Therapy: Development of new devices, functional neurovascular anatomy, Outcome research of neuroendovascular therapy</p>
Control of the Musculoskeletal System	<p>山崎 正志 YAMAZAKI Masashi</p>	<p>Clinical and basic research on following themes: ① Treatment of spinal disorders ② Treatment of joint disorders ③ Sports medicine ④ Regeneration of peripheral nerve ⑤ Functional improvement treatment using Robot suit HAL for musculoskeletal disorders</p>
Rehabilitation Medicine	<p>羽田 康司 HADA Yasushi</p>	<p>① Medicine for disabilities ② Adapted sports ③ Rehabilitation using robot suit HAL ④ Development of new rehabilitation equipment through medical-engineering collaboration</p>

Urology	西山 博之 NISHIYAMA Hiroyuki	①Cancers of genitourinary system ②Urodynamics ③Andrology ④Urolithiasis ⑤Urinary tract infection
Ophthalmology	大鹿 哲郎 OSHIKA Tetsuro	①Visual science ②Visual optics ③Minimally invasive ocular surgery ④Vision-related quality of life ⑤Development of artificial vitreous ⑥Development of new generation of OCT
Otolaryngology & Head and Neck Surgery	田淵 経司 TABUCHI Keiji	①Inner ear pathology ②Research for head and neck surgery
Oral and Maxillofacial Surgery	武川 寛樹 BUKAWA Hiroki	①New development of biological marker for oral cancer (p63 and GNT-V) ②Research for clinical diagnosis and treatment of oral cancer using microRNA (miR203, miR155, miR205 and let-7) ③Regenerated research using dental pulp stem cell ④Research for oral bacterial flora involved internal medical disease (NASH, NAFLD and diabetes mellitus)
Psychiatry	新井 哲明 ARAI Tesuaki	①Neuropathology of dementia and neurodegenerative disorder ②Clinical study of diagnosis, therapeutics, prevention and care of dementia ③Geriatric psychiatry ④Neuroimaging of neuropsychiatric disorders ⑤Transdisciplinary team approach for psychiatry
Disaster and Community Psychiatry	太刀川 弘和 TACHIKAWA Hirokazu	①Psychosocial study of disaster victims ②Mental health support for disaster supporters including health workers ③Development of post-disaster mental health and psychosocial support systems ④Social psychiatry of depression and suicide prevention ⑤Development of community mental health services and systems
Pediatrics	高田 英俊 TAKADA Hidetoshi	①Development of new gene therapy for genetic disorders of childhood using new Sendai virus vector ②Immunological analysis of host factor in children who developed vaccination-related adverse reaction ③Analysis of the characteristics of immune reaction of fetuses and neonates ④Nation-wide analysis of child disorders including primary immunodeficiencies ⑤Long term analysis of therapeutic effect of childhood cancer ⑥New objective analysis of the development of children

Obstetrics and Gynecology	濱田 洋実 HAMADA Hiromi	Basic and clinical researches about diagnosis, treatment, and prevention of diseases/disorders in the field of obstetrics and gynecology are conducted. Major subjects are gynecological malignancy, infertility, reproductive endocrinologic disorder, fetal genetic disease/malformation, fetomaternal infection, maternal, natal, and puerperal complications, etc.
Diagnostic and Interventional Radiology	中島 崇仁 NAKAJIMA Takahito	①Research in basic and clinical fields related to diagnostic imaging 1) Radiomics and Artificial Intelligent 2) DICOM transfer and storage system 3) Big data association with medical imaging and genomics ② Basic and clinical research about novel IVR treatments 1) Transarterial chemoembolization with balloon-occlusion 2) Cryoablation 3) Photoimmunotherapy
Radiation Oncology	櫻井 英幸 SAKURAI Hideyuki	①Research for radiosensitivity, and improvement of radioresistance ②Radiation treatment planning using multimodality imaging ③New cancer therapy using particle radiation therapy
Radiation Health Risk Science	磯辺 智範 ISOBE Tomonori	①Environmental radiation (distribution of radiation in soil, river, sea, crops and wildlife) ②Radiation exposure evaluation ③Soil and surface decontamination technology ④Dose Evaluation and Radiation Protection Technique of Medical Radiation Exposure to Eye Lens ⑤Dose evaluation of neutron exposure in radiotherapy ⑥Technical development on radiation disasters ⑦Development of new educational tool using X Reality
Anesthesiology	田中 誠 TANAKA Makoto	①Effects of anesthetics and anesthetic techniques on arterial baroreflex function ②Genetic polymorphism of opioid receptor in humans ③Research on basic mechanisms of pain perception ④Effects of anesthetics and age on Bispectral Index
Clinical Laboratory Medicine	川上 康 KAWAKAMI Yasushi	①Molecular understanding of the endocrine tumor and apoprotein. ②Molecular analysis of the cell proliferating factor. ③Molecular understanding of the hormone synthesis and secretion.
Molecular Sportology	()	①Development of novel exercise training for obese subjects with life style-related diseases ②Imaging analysis of organ lipid accumulation in obese subjects with life style-related diseases ③Development of glycobiomarkers for obesity and life style-related diseases ④Development of novel animal models for obesity and life style-related diseases

		<ul style="list-style-type: none"> ⑤Exercise-induced activation of antioxidative stress systems ⑥Understanding of exercise-induced inhibitory mechanism against carcinogenesis
	<p>竹越 一博 TAKEKOSHI Kazuhiro</p>	<ul style="list-style-type: none"> ①Personalized treatment for exercise through using genetic information ②Research for anti-doping ③Exercise and hormone, especially catecholamine ④Exercise and stress marker, especially salivary Chromogranin A (collaborated with Prof. Omori)
Pharmaceutical Sciences	<p>本間 真人 HOMMA Masato</p>	<ul style="list-style-type: none"> ①Gene Polymorphism analysis for assessing drug metabolizing enzymes and transporters ②Therapeutic drug monitoring for assessing drug efficacy and adverse reactions. ③Pharmacokinetic analysis of Kampo-medicine (Japanese herbal remedies)
Emergency and Critical Care Medicine	<p>井上 貴昭 INOUE Yoshiaki</p>	<ul style="list-style-type: none"> ①Physiology of septic shock and shock ②Physiology of acute respiratory distress syndrome and multiple organ failure ③Physiology of Post cardiac arrest syndrome ④Scientific approach for post intensive care syndrome and delirium
Clinical and Translational Research Methodology	<p>橋本 幸一 HASHIMOTO Koichi</p>	<ul style="list-style-type: none"> ①Regulatory science ②Clinical trials for functional foods ③Improvement of efficiency of practical medicine using AI and IOT ④Construction of seamless platform for translational research ⑤Education of experts of integrative celerity research process for translational researches
Clinical Research and Regional Innovation	<p>松阪 諭 MATSUSAKA Satoshi</p>	<ul style="list-style-type: none"> ①Development of clinical decision system (Liquid biopsy analysis) for cancer chemotherapy ②Understanding the mechanisms of cancer metastasis and anticancer agent resistance ③Functional studies of Organoids with Cancer Stem Cell-like Properties
Primary Care and Medical Education	<p>前野 哲博 MAENO Tetsuhiro</p>	<ul style="list-style-type: none"> ①Clinical research in primary care ②Development of community-based medical System ③Health promotion in the community ④Clinical medical education

Forensic Medicine	()	<ul style="list-style-type: none"> ①Research on forensic DNA testing ②Mitochondrial DNA polymorphism ③Studies on the toxicological mechanism of xenobiotics ④Research of molecular autopsy on sudden unexpected death
Medical Science and Welfare	()	<ul style="list-style-type: none"> ①Preventive medicine for non-communicable diseases and frailty, Medical welfare for elderly ②Genetic counselling, Bioethics
Integrated Study on Health Information	<p>大庭 良介 OHNIWA Ryosuke</p>	<ul style="list-style-type: none"> ①Science, Technology and Society (Health, Food, Life, Science history, etc.) ②Science communication (Health, Food, Life, etc.) ③Prototype development (Nutrition education materials, Food recipe, etc.) ④Application of microbial and natural resources ⑤Methodology study (Science, East Asian Traditional Philosophy, Kampo, etc.)

〈Master's Program in Public Health〉

Research Area	Faculty	Research
Occupational Psychiatry / Space Psychiatry	松崎 一葉 MATSUZAKI Ichiyo	①A study of the strong qualities unexpectedly in space ②Salutogenesis and Sense of coherence ③Nature based Rehabilitation
Primary Care and Medical Education	前野 哲博 MAENO Tetsuhiro	①Clinical research in primary care ②Development of community-based medical System ③Health promotion in the community ④Clinical medical education
Public Health Medicine	山岸 良匡 YAMAGISHI Kazumasa	Preventive measure of lifestyle-related diseases in communities and its evaluation
International Community Care and Lifespan Development: Empowerment Sciences	安梅 勅江 ANME Tokie	①Community empowerment ②Plasticity of lifespan development and implications ③System sciences for health social services
Gerontological Nursing & Caring	橋爪 祐美 HASHIZUME Yumi	①Gender issues and Japanese family caregiving, Interpersonal support for the middle-aged couple ②Caring the formal caregivers who take care of the relatives ③Toyamagata day service ④Community care in Mongolia ⑤Family caregiving by foreign bride and Japanese husband ⑥Qualitative research method (Grounded theory approach) , mixed method
Livelihood Support Science	水野 智美 MIZUNO Tomomi	①Barrier-free ②Child care and guardians' support ③Understanding persons with special needs
Health Services Research	田宮 菜奈子 TAMIYA Nanako	①Health Services Research (clinical medicine, long-term care, prevention services) ②Cooperation of medical care and welfare in the local community ③Policy evaluation of the long-term care insurance system ④Study for the improvement of the quality of in-home care and facility care for older people and people with disability ⑤Public Health based on legal medicine (older people, child abuse, solitary death, actual state of service-related death, etc.)

Epidemiology	我妻 ゆき子 WAGATSUMA Yukiko	①Principles and methods in epidemiology and their applications ②Medical statistics and medical information science ③Epidemiology for diseases ④Methods of clinical trials ⑤Strategy to control diseases
Biostatistics	五所 正彦 GOSHO Masahiko	①Developments of novel statistical methods for medical researches ②Evaluations of the performance of statistical methods ③Database studies
Social Psychiatry & Mental Health	斎藤 環 SAITO Tamaki	①Asocial problem behaviors in childhood and adolescence ②Development disorder and maladaptation ③Rehabilitation of people with mental disorder ④Dialogical practice (Open Dialogue)
	森田 展彰 MORITA Nobuaki	①Mental health of victims, Psychotherapy ②Intervention and treatment for family violence (Child abuse, Domestic violence, alder abuse and parent abuse by children) ③Recovery of addiction (Substance use disorder, gambling disorder and internet dependence) ④Forensic psychiatry, Criminology
Forensic Medicine	()	①Research on forensic DNA testing ②Mitochondrial DNA polymorphism ③Studies on the toxicological mechanism of xenobiotics ④Research of molecular autopsy on sudden unexpected death
Global Public Health	市川 政雄 ICHIKAWA Masao	①Global health research ②Community design & health ③Injury prevention & control
	堀 愛 HORI Ai	①Socio-economic disparity and countermeasure for infectious disease ②Health impact assessment on new tobacco ③Health checkup among workers, workers' cohort study ④Occupational health for healthcare workers
Medical Science and Welfare	()	①Preventive medicine for non-communicable diseases and frailty, Medical welfare for elderly ②Genetic counselling, Bioethics
Health Care Policy and Health Economics	近藤 正英 KONDO Masahide	①Application of economics for health care ②Health care policy research ③Global health economics