Application Guide

for

Japan-Russia Preventive Medicine Program 2019

Graduate School of Medical Sciences
Kanazawa University

Overview

Preventive Medicine Program by Kanazawa University is a specially developed program as part of Inter-University Exchange Project.

Doctoral (Ph.D.) level exchange programs in the fields of neuroscience, cancer medicine, cardiovascular medicine, social and environmental medicine, internal medicine, surgery, and reproductive and developmental medicine are proposed.

Its detailed program schedule will be provided after issuing a letter of acceptance (入学許可証) in the end of April 2019.

Note that this program is RESEARCH exchange for doctoral (Ph.D.) level students. It does NOT include visiting hospital(s) or patient(s).

Program Period

June 3 (Mon.) to June 14 (Fri.), 2019

Number of Students

The number of students accepted will be 5.

Scholarships and Fees

Up to 5 participants in this program will be provided a round-trip air ticket arranged by Kanazawa University. **If a participant arranges his/her air ticket by himself or herself, the person must bear its costs.**

Participants will be responsible for accommodation fees, meals, and other personal expenses throughout the program.

Some participants may receive a scholarship of up to 80,000 JPY.

*Note: Not all participants can receive a scholarship. Some students may participate in the program at his/her own expense even if he/she fails to be selected for the scholarship.

Research Field

Applicants will be accepted when their request matches the research fields.

All research fields and research themes are listed at the very end.

Eligibility

We are seeking the following students:

- to be medical and life science researchers;
- to be highly advanced medical professionals;
- to have English ability and communication skills necessary for conducting world-class research as medical administrator;
- to have sufficient knowledge about basic research and clinical research; and
- to have positive attitude to address the challenges willingly.

Applicants must meet all of the following requirements. They must

1. be currently enrolled in any medical related doctoral (Ph.D.) program at universities in Russia;
2. be proficient in English or Japanese in order to understand lectures;
3. go back to their home universities and continues their education after finishing the program;
4. be able to obtain appropriate visa status in Japan;
5. have a letter of recommendation from a representative of the school in which they are currently enrolled; and
6. be in good health.

Application Procedure

Step 1: Fill out the application form and prepare the additional documents below.

- Application for Special Auditor (Both of PDF format and original copy*)
- An official or unofficial transcript from your home institution (PDF format)
- Your ID photo (3cm x 4cm) in JPEG or other digital format
- A photocopy of the ID page of your passport (PDF format)
- A recommendation letter (Both of PDF format and original copy*)
- (If available) Copy of your official score report of TOEFL (iBT), Cambridge English (ESOL), TOEIC (L&R), or IELTS.

Step 2: Submit the completed application materials to the international office of your home institution. Note that we only accept applications through your home institution. Applications from individual students will not be accepted.

Step 3: Your home institution will send the application materials by the following deadline.

Application Deadline: **April 5 (Fri), 2019**

*The original copy of the "Application for Special Auditor" and the recommendation letter can be sent later.

Notification of Acceptance

Kanazawa University will notify the acceptance to the international office of your home institution by the end of April 2019.

Visa

Depending on his/her nationality, participants in the program may be required to obtain a "Temporary Visit (Tourist)" Visa. The procedure for obtaining visa will be notified after the acceptance notification. For more information, please check the link below.
https://www.mofa.go.jp/j_info/visit/visa/

Housing

Participants will stay in a student dormitory of Kanazawa University.

● For inquiry, please contact:

Natsumi KOSHIKAWA (Ms.)
Graduate Student Affairs Section (Med.)
Kanazawa University
13-1, Takara-machi, kanazawa, Ishikawa, 920-8640 JAPAN
TEL: +81-(0)76-265-2124
Email: t-daigakuin@adm.kanazawa-u.ac.jp

Research Fields

Research fields where professors familiar with this program are enrolled are in bold.

Department of Neuroscience

Medical Neuroscience

Hiroshi KAWASAKI, M.D. & Ph.D., Professor

1. **Genetic and environmental factors regulating the formation of the brain**
2. **Mechanisms regulating the formation of higher brain structures that are specific to higher mammals**
3. **Pathophysiology of neurodevelopmental disorders**

Histology and Cell Biology

Masaaki NISHIYAMA, M.D. & Ph.D., Professor

1. Functional analysis of causative candidate genes in autism spectrum
2. Control mechanisms of aging and cancer by chromatin remodeling
3. Mechanisms of spermatogenesis and male infertility

Functional Anatomy

Noriyuki OZAKI, M.D. & Ph.D., Professor

1. Mechanisms of inflammation and neuropathic pain occurred in various parts of the body such as skin, viscera, muscle, joints, etc.
2. Development of novel animal model of functional pain disorders such as Functional Dyspepsia and myofascial pain syndrome
3. Neuroanatomy and physiology of somatic and visceral pain systems

Integrative Neurophysiology

Michihiro MIEDA, Ph.D., Professor

1. Neural network of the central circadian clock
2. Inputs and outputs of the central circadian clock
3. Disturbance of the circadian rhythm and disorder

Neuroanatomy

Osamu HORI, M.D. & Ph.D., Professor

1. **Identification and characterization of glia-derived stress-related genes**
2. **Roles of the endoplasmic reticulum (ER) stress response in brain ischemia and in neurodegenerative diseases**
3. **Screening of chemical compounds which can regulate glial activities**
4. **Role of glial cells in neuropsychiatric diseases**

Developmental Neurobiology

Makoto SATO, Ph.D., Professor

1. Formation of neuronal circuits in the visual system
2. Functional analysis of visual processing circuits
3. Molecular mechanisms of neuronal migration disorders

Neurology and Neurobiology of Aging

Masahito YAMADA, M.D. & Ph.D., Professor

1. Studies on brain aging, dementia, and amyloidosis
2. Studies on neuroimmunology and infection
3. Studies on neurodegenerative diseases
4. Studies on cerebrovascular disorders

Psychiatry & Behavioral Science

N/A due to absence of a professor

1. Clinical and biological studies of pervasive developmental disorders, in collaboration with some major academic programs of Kanazawa University
2. Clinical and biological studies of schizophrenia and allied psychosis
3. Clinical and biological studies of drug-abuse and allied psychosis

Clinical Cognitive Neuroscience

Mie MATSUI, Ph.D., Professor

1. Neuropsychological studies in patients with higher brain dysfunction
2. Lifelong development of brain structure/function and neuropsychological function
3. Cognitive remediation and neuroplasticity in schizophrenia

Department of Cancer Medicine

Molecular and Cellular Pathology

N/A due to absence of a professor

1. Analysis of signal transduction of receptor tyrosine kinases in human solid carcinomas
2. Detections of gene amplifications of CCNE1, CCND1 and CDK6 in solid carcinoma
3. Analysis of tumor angiogenesis-associated genes in the tumor microenvironment
4. Identification of cancer morphology and invasive related factors

Stem Cell Biology

Tadayuki AKAGI, Ph.D., Associate Professor

1. Molecular mechanism of self-renewal in ES cells
2. Switching mechanism from the undifferentiated state to the differentiated state
3. Mechanism of ES cell differentiation into a certain lineage cells
4. Comparison of characteristics between ES and cancer stem cells

Human Pathology

Kenichi HARADA, M.D. & Ph.D., Professor

1. Pathogenesis of primary biliary cholangitis (cirrhosis), IgG4-related diseases, non-alcoholic steatohepatitis, biliary atresia, hepatolithiasis, and idiopathic portal hypertension
2. Carcinogenesis of primary liver cancers
3. Functional analysis of cholangiocyte in physiological and pathological conditions
4. Pathogenesis congenital biliary malformation and establishment of animal model

Global Cancer therapy and Research

Seiji YANO, M.D. & Ph.D., Professor

1. Advanced course for global cancer therapeutics
2. Advanced surgical medicine for cancer therapy
3. Molecular diagnosis of neoplasm
4. Advanced photonic therapeutics for cancer
5. Psychological care for cancer patients

Molecular Virology & Oncology

N/A due to absence of a professor

1. Molecular mechanism of tumor invasion and metastasis
2. Screening of genes associated with tumor invasion and metastasis
3. Extracellular matrix metabolism
4. Epstein-Barr virus-associated tumors

Cancer Cell Biology

Noriko GOTOH, M.D. & Ph.D., Professor

1. Molecular mechanisms of cancer initiation, progression and metastasis
2. Identification of new biomarkers and molecular targets of lung cancers by systems biology approach
3. Signal transduction mechanisms through receptor tyrosine kinases (RTKs) for tumorigenesis and stem cell maintenance

Translational and Clinical Oncology

Toshinari MINAMOTO, M.D. & Ph.D., Professor

1. Molecular mechanism underlying oncogenic signaling networks
   (1) Deregulated Wnt/β-catenin signaling
   (2) Glycogen synthase kinase 3β (GSK3β)-mediated signaling
2. Molecular basis of gastrointestinal and refractory cancers for clinical translation
3. Establishment of tissue material resources of human gastrointestinal cancer

Immunology and Molecular Biology

Takashi SUDA, Ph.D., Professor

1. Role of the NLR family and related proteins in tumor cells
2. Molecular mechanism of pyroptosis
3. Role of RYNOD
4. Search for novel activator and inhibitors for the inflammasome

Oncology and Molecular Biology

Chiaki TAKAHASHI, M.D. & Ph.D., Professor

1. **The RB tumor suppressor gene product that has been implicated in control of cell cycle and terminal differentiation**
2. **Analysis of oncogenic signals that induce malignant behaviors in cancer cells through metabolic reprogramming**
3. **Development of in vivo & in vitro cancer stem cell models**

Molecular Bioregulation

Naofumi MUKAIDA, M.D. & Ph.D., Professor

1. To elucidate the roles of endogenously produced chemokines and pro-inflammatory cytokines in the processes
2. The pathophysiological roles of serine/threonine kinase, Pim-3, a proto-oncogene expressed selectively in carcinogenesis

Molecular cell Signaling

Katsuji YOSHIOKA, Ph.D., Professor

1. Mechanisms and roles of scaffolding proteins for mammalian MAPK cascades in the specificity of the signaling pathways
2. Characterization of genetically engineered mice for the scaffolding proteins JSAP1 and JLP
3. Functional analysis of the scaffold proteins JSAP1 and JLP in the developing brain

Functional Genomics

Takeshi SUZUKI, Ph.D., Professor

1. Identification of novel cancer genes using retroviral insertional mutagenesis in mice
2. Functional analysis of histone methyltransferases and demethylases in the initiation and malignant progression of cancer
3. The role of three families of enzymes in DNA demethylation pathway on cancer development

Genetics

Masanobu OSHIMA, D.V. M. & Ph.D., Professor

1. Mechanism for malignant progression
2. Tumor microenvironment for cancer development
3. Analyses using human cancer tissues

Tumor Dynamics

Kunio MATSUMOTO, Ph.D., Professor

1. Significance of Met dynamics in invasion-metastasis and drug resistance
2. Structure-based drug discovery targeting HGF-Met protein-protein interaction
3. Discovery of artificial small HGF and its application to regenerative medicine
4. Physiological role of HGF-MET pathway in innate immunity
5. Structural biology for Met activation

Molecular Genetics

Atsushi HIRAO, M.D. & Ph.D., Professor

1. Molecular mechanisms of stem cell self-renewal
2. Molecular mechanisms of tumor suppression regulated by cell cycle check point system
3. Identification of cancer stem cells

Medical Oncology

Seiji YANO, M.D. & Ph.D., Professor

1. Phase I/II investigator initiated trials to assess the efficacy and safety of alectinib in lung cancer patients with RET-fusion gene (ALL-RET)
2. Researches to clarify the molecular mechanisms of targeted drug resistance in central nervous system, utilizing *in vivo* imaging models of several tumor types

Department of Cardiovascular Medicine

Molecular Vascular Physiology

Yoh TAKUWA, M.D. & Ph.D., Professor

1. The physiological and pathophysiological roles of the lipid mediator sphingosine-1-phosphate (S1P)-Edg, G protein-coupled receptor axis in vascular development and homeostasis, cardiovascular pathophysiology including angiogenesis, arthrosclerosis and cardiac hypertrophy-fibrosis, and tumor biology including tumor invasion, metastasis and angiogenesis
2. The physiological and pathophysiological roles in angiogenesis, vascular permeability regulation, the normal vascular tone regulation, and hypertension of the lipid kinase class II phosphoinositide 3-kinase (PI3K-C2 α) that we discovered

Pharmacology

Kazuhiro OGAWA, M.D. & Ph.D., Associate Professor

1. Heme catabolic pathway as a defense mechanism: heme oxygenases (HOs) as key enzymes
2. Drugs and food chemicals modulating heme metabolism

Cellular and Molecular Function Analysis

Hitoshi ANDO, M.D. & Ph.D., Professor

1. Elucidation of the mechanisms underlying the association between impaired circadian clock and the development of lifestyle-related diseases, and the development of therapeutic agents
2. Chronopharmacology
3. Basic pharmacological research
4. Clinical pharmacological research

Biochemistry and Molecular Vascular Biology

Yasuhiko YAMAMOTO, M.D. & Ph.D., Professor

1. **Vascular biology – the molecular basis of vascular homeostasis and of vascular cell responses against various pathologic insults**
2. **Vascular medicine – the mechanisms of the development and prevention of diabetic vasculopathy, angiogenesis diseases, and hypertensive vascular derangement**
3. **Neuroscience – the mechanisms of Alzheimer's disease and vascular dementia**
4. **Cellular and molecular immunology – the impact of immunological changes and inflammation in diabetic complications, arthrosclerosis, angiogenesis, and obesity**

Circulatory Emergency and Resuscitation Science

Hideo INABA, M.D. & Ph.D., Professor

1. Analysis of modifiable factors related to survival of out-of-hospital cardiac arrests
2. Medical control in emergency medical service system
3. Pathophysiology of ischemia-reperfusion injury
4. Pathophysiology of disturbance of microcirculation

Clinical Development

Toshinori MURAYAMA, M.D. & Ph.D., Professor

1. Study management
2. Compensation for bodily health damage of study participants
3. management of safety information
4. Management of data monitoring committee of investigator-initiated trials
5. The strategic coordination among researcher education, research associates nurturing, and medical technology excavation

Clinical Pharmacokinetics

Yoshimichi SAI, Ph.D., Professor

1. Molecular biopharmaceutical study on metabolic enzymes and drug transporters as a molecular determinant of inter- and intra-individual variability of drug efficacy, toxicity and disposition
2. Clinical pharmacokinetic study on monitoring and avoidance of adverse effect of drugs
3. Clinical pharmacological study for proper use of drug to improve QOL of patients
4. Research on ensuring subject safety in clinical trials

Department of Social and Environmental Medicine

Molecular Genetics

Makoto KURACHI, M.D. & Ph.D., Professor

1. Molecular immunology and biology
2. Molecular mechanism of T-cell memory and exhaustion
3. Molecular mechanism of antiviral factors
4. Physiological and pathological role of deaminase super family

Immunology

Rikinari HANAYAMA, M.D. & Ph.D., Professor

1. **What are the molecular mechanisms of exosome secretion?**
2. **What are the physiological functions of exosomes?**
3. **How do exosomes travel from secretory cells to the target cells *in vivo*?**

Parasitology

Masaharu TOKORO, M.D. & Ph.D., Associate Professor

1. New strategy for the development of chemotherapeutic drugs against *Cryptosporidium* infection
2. Study of intra-species diversity in *Giardia intestinalis*
3. Genetic diversity of clinical isolated *Acanthamoeba* spp. From keratitis cases in Japan
4. Comprehensive identification method: Utilization of molecular taxonomy for identification of pathogenic/non-pathogenic protozoan parasites
5. Genetic identification of various trichomonads species isolated from humans and related mammals in Indonesia

Bacteriology

Yukako FUJINAGA, Ph.D., Professor

1. Study on the structure and function of the botulinum neurotoxin complex, which must pass down the digestive tract and cross the epithelial barrier lining the intestine to cause food-borne botulism

Environmental and Preventive Medicine

Hiroyuki NAKAMURA, M.D. & Ph.D., Professor

1. The innovative methods using new concept of "super-preventive medicine", which compasses preventive methods in all levels of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} dimensions
2. Interactions between genetic and environmental factors in etiology of lifestyle-related diseases, and allergic disorders and epigenetics
3. The effect of environmental chemicals and Asian dust on allergic diseases
4. Epidemiology of development of health behavior and dietary habit in children
5. Health economics epidemiology towards the optimization of the cost for the expenses for medical and long-term care with a focus on the analysis of factor influencing QOL and disease structure n the elderly

Viral Infections and International Health

Hiroshi ICHIMURA, M.D. & Ph.D., Professor

1. Viral and host factors associated with disease progression in HIV-infected children
2. Molecular epidemiology of drug-resistant HIV
3. Impact of ART on the immune status of HIV-infected children
4. Role of HBV and HCV co-infections in AIDS progression
5. Impact of HIV infection of the other infectious diseases

Forensic Medicine and Pathology

Masahiko ZUKA, M.D. & Ph.D., Professor

1. Evaluation of the causes of different criminal or sudden unexpected death cases by medico-legal autopsies and close examinations
2. Forensic pathological investigation on the mechanism of atherosclerotic change of the intima of vessels and biochemical issues of cerebrospinal fluids, and their application to forensic case work
3. Medico-legal expert witness of complicated criminal affairs and medical malpractice
4. Research of central nervous system focused on ER stress using rat models conditioned with methamphetamine

Hygiene

Kiyofumi SAIJOH, M.D. & Ph.D., Professor

1. Molecular mechanisms underlying adaptation to environment and regulation of signal transduction
2. Alteration in gene regulation according to proliferation, differentiation, aging, carcinogenesis, etc.
3. Function of epidermis, hair and appendages as a barrier
4. Molecular mechanisms of intoxication/detoxication against environmental pollutants
5. Alcohol and drug abuse; Molecular mechanisms developing tolerance, addiction, etc.

Physiology and Metabolism

Hiroshi INOUE, M.D. & Ph.D., Professor

1. Regulation of organ interaction to maintain hepatic energy metabolism
2. Investigation of the crosstalk between the cell proliferation and cell metabolism in the liver
3. Therapeutic development for hepatic energy disorders by the application of mechanism of the CNS/liver crosstalk

Cell Metabolism and Nutrition

Tatsuya YAMASHITA, M.D. & Ph.D., Associate Professor

1. Research into liver diseases relevant to nutrient metabolism disorders and lifestyle-related diseases
2. Research into public health interventional measures for liver diseases
3. Research into chronic liver diseases and liver cancers in West-Pacific region

Bioinformatics and Genomics

Atsushi TAJIMA, Ph.D., Professor

1. Genetics and genomics of complex human diseases
2. Epigenomics of health and disease in human populations and model organisms
3. Bioinformatics for integrative genomics and epigenomics analyses

Molecular Pathology of Skin

Kazuhiro TAKEHARA, M.D. & Ph.D., Professor

1. Research on regulatory mechanisms of fibrosis in patients with systemic sclerosis and model mice for systemic sclerosis
2. Role of adhesion molecules and chemokines in pathogenesis of skin diseases
3. Role of growth factors in wound healing
4. Role of B cells and complements in pathogenesis of inflammatory diseases
5. Immunological changes in patients with systemic sclerosis

Healthcare Management and Medical Informatics

Keisuke NAGASE, M.D. & Ph.D., Professor

1. Management studies on healthcare organizations
2. Healthcare Marketing (Modeling of patient visit pattern)
3. Application of artificial intelligence in healthcare services and its management
4. Studies on Healthcare policy (International patient referrals and service exportation)
5. Studies on Healthcare human resources (Modeling of healthcare human resource supply)

Health Promotion and Medicine of the Future

Takashi YONEDA, M.D. & Ph.D., Professor

1. Establishment of precision medicine using genome and epigenome information and OMICS analysis
2. Establishment of telemedicine and health promotion system using AI and ICT
3. Research for pharmaceutical approval of diagnostic tests and medical devices

Department of Internal Medicine

Gastroenterology

Shuichi KANEKO, M.D. & Ph.D., Professor

1. Molecular pathology in obesity and diabetes
2. Clinical research for diabetes and its complications
3. Gene and protein expression profiling and genome sequencing of gastrointestinal and metabolic diseases
4. Molecular basis of interferon treatment of chronic hepatitis and prevention of hepatocellular carcinoma
5. Molecular analysis of hepatocarcinogenesis and the prevention research

Endocrinology and Metabolism

Toshinari TAKAMURA, M.D. & Ph.D., Professor

1. Hepatokine-mediated networks among insulin-targeting organs to make pathophysiology of diabetes/obesity and its complications
2. Molecular pathology and clinical research in diabetes¥obesity and its complications
3. Cross-talks among glucose-, protein-, and lipid-metabolism pathway to keep energy homeostasis

Nephrology and Laboratory Medicine

Takashi WADA, M.D. & Ph.D., Professor

1. **Establishment of novel mechanisms involved in development, progression, remission and regression of kidney diseases and diabetic complications**
2. **Application of newly developed methods for clinical nephrology and other aspects**
3. **Approach to elucidate immune status of the host with hepatocellular carcinoma using gene expression profile of blood cells**

Cardiovascular and Internal Medicine

Masayuki TAKAMURA, M.D. & Ph.D., Professor

1. Pathological analysis using disease-specific iPS cells
2. Novel therapy using gene-correction
3. Regeneration therapy for heart failure, cardiomyopathy, and arrhythmia
4. Development of coronary stent using EPC
5. Comprehensive gene analysis of dyslipidemia

Rheumatology

Mitsuhiro KAWANO, M.D. & Ph.D., Associate Professor

1. Pathogenetic analysis of IgG4-related disease
2. Development of new treatment using mouse model of IgG4-related disease
3. Pathogenetic analysis of SLE using lupus mouse model
4. Clinical study of Sjogren's syndrome

Hematology

Shinji NAKAO, M.D. & Ph.D., Professor

1. Immune pathophysiology of hematopoietic failure
2. Graft-versus-leukemia effect
3. Minimal residual disease of multiple myeloma
4. Disseminated intravascular coagulation
5. Anti-phospholipid syndrome

Respiratory Medicine

Kazuo KASAHARA, M.D. & Ph.D., Associate Professor

1. Driver mutation analysis in circulating-free DNA as surrogate tumor tissue
2. Prediction of gene abnormality in the drug resistance using pre-treatment tumor tissue
3. Growth factor and sensitivity for cytotoxic anticancer agents
4. Association in immune checkpoint and DNA mismatch repair
5. Mechanisms of cough induced by broncho-constriction

Radiology

Toshifumi GABATA, M.D. & Ph.D., Professor

1. Diagnosis and treatment of malignancy of hepatocellular carcinomas
2. Diagnosis of hepatobiliary and pancreatic diseases with CT and MRI
3. Diagnosis of cerebral tumor and neurovascular diseases with MRI
4. Diagnosis of IgG4-related disease with CT and MRI
5. Transcatheter embolization for hepatocellular carcinomas

Nuclear Medicine

Seigo KINUYA, M.D. & Ph.D., Professor

1. Pre-clinical investigation of targeted radiotherapy and its clinical application
2. 1-131-MIBG therapy for neuroendocrine malignancies
3. Pharmacokinetic modeling to analyze nuclear images
4. Assessment and prediction of therapeutic responses of tumors with radiotracers
5. Functional assessment of the heart with multimodal images

Department of Surgery

Thoracic, Cardiovascular and General Surgery

Hirofumi TAKEMURA, M.D. & Ph.D., Professor

1. Pathophysiology of ischemic, valvular and congenital heart diseases
2. Hematological research of extracorporeal circulation
3. Cell biology of lung cancer and analysis of factors affecting prognosis
4. Pathophysiological study of lymph node metastasis
5. Development of procedure of esophageal reconstruction and its clinical introduction
6. Basic and clinical research in chemotherapy against gastrointestinal cancer

Gastroenterological Surgery

Sachio FUSHIDA, M.D. & Ph.D., Associate Professor

1. Esophageal carcinogenesis and inflammation
2. Surgical stress and immnonutrition
3. Prevention of organ fibrosis in peritoneal carcinomatosis of gastric cancer
4. Interaction between cancer cell and stromal cell in the cancer microenvironment

Hepato-Biliary-Pancreatic Surgery

Tetsuo OHTA, M.D. & Ph.D., Professor

1. Immuno-nutritional approach for perioperative management in high-risk patients
2. Molecular pathology in cancer microenvironment of digestive disease
3. Development of pathogenesis and new therapies for organ failure due to sepsis
4. Histopathology of liver regeneration after small graft transplantation
5. Pathogenesis of extravasated platelet aggregation in post chemotherapeutic liver

Orthopedic Surgery

Hiroyuki TSUCHIYA, M.D. & Ph.D., Professor

1. Development of the antibacterial custom-made prosthesis
2. Identification and analysis of characteristics of cancer stem cell in osteosarcoma
3. Analysis of anti-tumor effect PPARγ in giant cell tumor of bone and soft tissue
4. Muscle-skeletal regenerative medicine with adipose-derived stem cell
5. Novel antibody therapy for osteosarcoma

Physical and Rehabilitation Medicine

Tetsutaro YAHATA, M.D. & Ph.D., Associate Professor

1. Inactivity and physical deconditioning: Effectiveness of physical reconditioning
2. Muscle dystonia and spasticity: Advancing of focal control
3. Analysis of swallowing kinetics using videofluorography: Kinetic analysis of larynx and hyoid bone; Device for oral pharmaceutical formulation; Device for contrast bolus; Safety analysis for radiation exposure during examination
4. Development of locomotive analysis: Evaluating daily essential behaviors; Quantitative evaluating for muscle activity

Integrative Cancer Therapy and Urology

Atsushi MIZOKAMI, M.D. & Ph.D., Professor

1. Early diagnosis for bladder cancer: detection of new markers
2. Identification of metastasis-related factors in urogenital cancer
3. Mechanism of hormone-refractory status in prostate cancer
4. Molecular target in treatment for hormone refractory prostate cancer
5. Chemotherapy for hormone refractory prostate cancer

Ophthalmology

Kazuhisa SUGIYAMA, M.D. & Ph.D., Professor

1. Structure-function relationships in glaucoma
2. Long term predictability of glaucomatous visual field loss progression
3. Disturbance in fundus blood flow in glaucoma
4. Relationship between diurnal variation of intraocular pressure and clock genes
5. Blood flow in the optic nerve head in rat eyes

Otolaryngology – Head and Neck Surgery

Tomokazu YOSHIZAKI, M.D. & Ph.D., Professor

1. Basic and clinical research of head and neck cancer
2. Impact of allergic inflammation on carcinogenesis and tumor progression
3. Research about hearing loss and speech therapy
4. Kanazawa-method for profound deaf children
5. cochlear implant for deaf patients

Anesthesiology and Intensive Care Medicine

Takumi TANIGUCHI, M.D. & Ph.D., Professor

1. Study of preoperative management: Study of the effects of various drugs were administered preoperatively during operation; Study of the improvement of resuscitation skill
2. Study of intraoperative management: Study on the therapeutic effects of various anesthetics for septic shock; Study of the correspondence in the abrupt change during operation
3. Study of intensive care: Development of new blood purification and studies on the effect of sedatives (sepsis, liver failure, kidney failure and multiple organ failure) in various pathological conditions

Neurosurgery

Mitsutoshi NAKADA, M.D. & Ph.D., Professor

1. Integrated neurosurgery for malignant glioma
2. Innovative chemotherapy for malignant brain tumor
3. Exploration of biomarkers for the malignant glioma
4. Network of higher brain function revealed by awake surgery
5. Expansion of endovascular surgery for stroke

Oral and Maxillofacial Surgery

Shuichi KAWASHIRI, D.D.S. & Ph.D., Professor

1. Analysis of the mechanism of invasion and metastasis of oral cancer
2. Analysis of the mechanism of temporomandibular joint disease (TMD) synovitis development
3. Analysis of association between TMD during the growth phase and jaw deformity
4. Regeneration of dental pulp

Department of Reproductive and Developmental Medicine

Transgenic Animal Science

Takiko DAIKOKU, Ph.D., Professor

1. Analysis of the molecular and genetic signaling pathways involved in endometrial cancer in gene-mutated mice
2. Analysis of the molecular and genetic signaling pathways involved in pregnancy in gene-mutated mice
3. Collaborative research to generate gene-manipulated mice

Pediatrics

N/A due to absence of a professor

1. Pathogenesis of genetically-determined diseases involving multi-organ systems
2. Ontogeny of immune system and its abnormality, in particular, primary immune-deficiency diseases
3. molecular pathogenesis of vascular diseases autoimmune diseases and auto-inflammatory illnesses
4. Epidemiological and pathological analysis of food-induced allergy during infancy
5. Immune dysregulation and tumor pathogenesis in association with EBV infection

Obstetrics and Gynecology

Hiroshi FUJIWARA, M.D. & Ph.D., Professor

1. Gynecologic oncology: Analysis of tumor stem cells; Analysis of circulating tumor cells
2. Reproductive medicine: Analysis of mechanisms for human embryo implantation by the immune system; Analysis of endometrial epithelial cell function
3. Perinatology: Analysis of mechanisms for human placentation; Analysis of function of novel trophoblast-specific peptidase, laeverin