

Guidelines of Application of Master's Programs

Master's Program in Medical Sciences

Master's Program in Public Health

Graduate School of Comprehensive Human Sciences,
University of Tsukuba



NUMBER OF STUDENTS TO BE ADMITTED

Limited

QUALIFICATION OF APPLICANTS

The qualification for the admission includes at least one of the followings:

- (1) 4-year College Degree Holder.
- (2) Persons who have completed 16 years of school education outside Japan.
- (3) Persons who have been qualified through our admission screening and was judged to have accomplished equivalent to 4-year College degree. The applicant must be 22 years or older before enrollment to the program.*

* The degree qualification will be examined individually.

To apply for Dual Master's Degree Program, the applicant must be enrolled in: The University of Medicine and Pharmacy at Ho Chi Minh City (Vietnam), University of Science at Ho Chi Minh City (Vietnam) or National Taiwan University.

PROFICIENCY IN ENGLISH

It is necessary for applicant to demonstrate an adequate command of the English language to benefit from studies at this University. All applicants, if their first language is not English or if their studies at university have not been conducted solely in English, must demonstrate English language proficiency by taking the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) and having their score reported directly to University of Tsukuba, Graduate School of Medical Sciences (TOFEL center code: 7902). TOEFL and IELTS score reports must be dated within two years of enrollment in this University. Photocopies are accepted.

REQUIRED DOCUMENTS

- | | |
|------------------------------------|---|
| 1 Application Form | Fill out the attached application form designated by University of Tsukuba. Please select which program and term you wish to apply. |
| 2 Reference Form | Applications will be considered with academic references. Reference form should be accompanied with at least one letter of recommendation. |
| 3 Picture | Attach a picture of yourself taken within three months, facing forward without hat on the Application Form Size: 4 cm x 3cm (h x w). |
| 4 Application Fee | <p>30,000 yen (will not be charged to the applicants with Japanese Government Monbukagakusho Scholarship or if applied for Dual Master's Degree Program). Payment by credit card is available at:</p> <p>https://e-shiharai.net/english/?schoolcode=OPU5100850000000</p> <p>Due by application deadline. Payment in Japan is available through post office, banks, convenience stores and various banking institutions. Please contact for the instruction by e-mail: iga-in@un.tsukuba.ac.jp.</p> |
| 5 Certificate of Graduation | Submit a certificate which fulfills our qualification requirements, Normally from the University/College (or the department) where degree was awarded. |

- | | |
|---------------------------------------|---|
| 6 Transcript | All applicants are required to provide evidence of their academic qualifications for the application. Submit a transcript of the school, which fulfills our qualification requirements, normally from the university (or the department) where a degree was awarded. If you are a transfer student, submit transcripts from both schools, before and after the transfer from your current University. |
| 7 English Language Proficiency | If English is not your first language, request your TOEFL or IELTS score sent directly to this University (TOEFL code: 7902). Photocopies are accepted. |
| 8 Photocopy of your passport | ※ If you do not have a passport yet, you are required to submit Family Register or Certificate of Citizenship issued by your home country. |

APPLICATION PROCEDURE

Please verify all the documents carefully and submit the documents to:

Academic Service Office for the Medical Sciences Area
University of Tsukuba
1-1-1 Tennodai, Tsukuba, Ibaraki 305-8575, Japan

Please use the attached recommendation letter form. The letter may be sent from the referee as an e-mail attachment or with the application forms in a sealed envelope.

Information about Exam will be issued by e-mail when the application documents are accepted.

Applicants must contact their prospective supervisor about the specialized research field in advance.

<Click here for the contact information (of the program) about the research fields.>

Application Period: Please refer to our web page for the application deadline.

SELECTION METHOD

Selection will be based on (a) Academic records (b) Oral examination (c) English proficiency during the interview. Prospective applicant will be contacted by e-mail after the preliminary screening based on the submitted documents. Date and location of an interview will be arranged. The applicant will be able to select the venue where the oral examination will be offered.

ADMISSION PROCEDURE

Succeed applicants will receive an instruction on the admission procedure by e-mail. An official letter from the University of Tsukuba will be sent by mail.

TUITION AND FEES

Admission Fee: 282,000 yen (will not be reimbursed once received).

Tuition Fee: First Half of Academic Year (April - September): 267,900 yen

Second Half of Academic Year (October - March): 267,900 yen

*Tuition Fees Amount: 535,800 yen annually

**Applicants are advised to make a sufficient financial plan for their tuition fee and living expenses in Japan.*

Both tuition and fee are waived for (a) Dual Master's Degree candidate (b) applicants with Japanese Government (Monbukagakusho) Scholarship.

NOTES

- 1) Application that is incomplete will not be processed.
Validation seals of the institution are required on the copies of Certificate of Graduation and Academic Transcript.
- 2) Application documents will not be returned to the applicants.
- 3) The inquiries about the result of Achievement Test are not accepted.
- 4) Please contact the International Office of further questions on admission or application procedure.
E-mail: iga-in@un.tsukuba.ac.jp.

Application Form for Master's Programs

Master's Program in Medical Sciences

Master's Program in Public Health

Graduate School of Comprehensive Human Sciences, University of Tsukuba



PLEASE PRINT OR TYPE ALL SECTIONS

1. APPLICATION FOR: ☐ Fall (October), 2020 ☐ Spring (April), 2021

- ☐ Master of Public Health Program (Two-years)
☐ Master's Program in Medical Sciences (Two-years; including Japanese applicant living abroad)
☐ Dual Master's Degree Program

2. PERSONAL DATA

Family Name _____ Middle Name _____
First Name _____ Title (Mr./Ms./Dr., etc.) _____
Nationality _____ Date of Birth (d/m/y) _____
Address _____ Postal code _____
Telephone _____ Mobile _____
E-mail _____ Skype ID _____

3. PROPOSED STUDIES

List the 2nd and 3rd choices in case the 1st choice is not selected.

	Research Field	Supervisor
1 st choice :	_____	_____
2 nd choice :	_____	_____
3 rd choice :	_____	_____

4. DEGREE OR DIPLOMAS AWARDED OR TO BE AWARDED

University / College	Degree (AA, BA, MSc, etc.)	Major	Course Dates (month/year)	Conferred or expected date (month/year)
_____	_____	_____	_____ to _____	_____
_____	_____	_____	_____ to _____	_____
_____	_____	_____	_____ to _____	_____
_____	_____	_____	_____ to _____	_____

5. EMPLOYMENT HISTORY

Name and Address of employer (including country)	Type of Contract (fixed, temporary or permanent)	Position	Dates (month/year)
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____

6. LANGUAGE

First Language _____ Other Language _____

English Language Test Taken (e.g. TOEFL, IBT)	Date of Test (month/year)	Overall Score	Written Score
_____	_____	_____	_____
_____	_____	_____	_____

Official copy of English language proficiency test must be sent to the Registrar office when the results are available.

7. LETTER OF RECOMMENDATION

If you have research experience in academic institutions during the past 5 years, you are required to obtain letters of recommendation from faculty who is familiar with your study. If you have any work experience, the second recommender should be from your employer. If you have no record of employment, the second recommender should be from another academic.

FIRST RECOMMENDER

Name _____ Position _____
Address _____
Tel _____ Fax _____
E-mail _____

SECOND RECOMMENDER

Name _____ Position _____
Address _____
Tel _____ Fax _____
E-mail _____

YOU SHOULD SEND YOUR REFERENCES IN A SEALED ENVELOPE WITH YOUR APPLICATION FORM

You should send your reference letter in a sealed envelope with your application forms or ask the recommender to send it directly to the International Office at the University of Tsukuba, Medical Branch.

8. FINANCIAL PLAN (Applicant for Dual Master's Program do not need to complete this section)

Who is paying your tuition?

- ☐ I will pay my own fees.
☐ I have been awarded for sponsorship. I will send an original document to Registrar and complete the details below.
☐ I have applied for sponsorship. Decision expected (month/year) _____

NAME & ADDRESS OF SPONSOR

AMOUNT OF AWARD

_____	_____
_____	_____
_____	_____

Who is paying your living costs?

- ☐ I will pay my own fees.
☐ I have been awarded sponsorship. I will send an original document to Registrar and complete the details below.
☐ I have applied for sponsorship. Decision expected (month/year) _____

NAME & ADDRESS OF SPONSOR

AMOUNT OF AWARD

_____	_____
_____	_____
_____	_____

I certify that the statements made by me on this form are correct and complete. I certify that I will not be concurrently registered for another Degree of the University of Tsukuba. I understand that, if admitted to the University, the University will not be able to provide any financial assistance. To be signed and date by applicant.

Signature _____

Date: _____

Field of Study & Study Program

(1) Describe your current field of study:

(2) Describe your study and research you plan to pursue (use additional pages if necessary) :

TO THE APPLICANT: APPLICANT DETAILS

Program applied for:

What is your relationship with the applicant? (e.g. student/employee) _____

E-mail _____ Telephone _____

[illegible]

COMMENTS

We would appreciate your comments on the applicant's qualifications for graduate study in the space below. If you prefer writing with a separate recommendation letter, or need additional space, please use official letterhead stationery and mark a cross this part.

OVERALL RECOMMENDATION

Please select one of the following:

- ☐ I strongly recommend this applicant for the program of study
- ☐ I recommend the applicant for the program of study
- ☐ I do not recommend the applicant for the program of study
- ☐ I am unable to comment

Signature _____

Date _____

Thank you for completing this form. Please sign above and enclose this form in an envelope, seal it and return it to the applicant or send directly to the address below. You may also e-mail the signed form to iga-in@un.tsukuba.ac.jp.

Academic Service Office for the Medical Sciences Area
University of Tsukuba
1-1-1 Tennodai, Tsukuba, Ibaraki 305-8575, Japan

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. In order to avoid having to write your Master’s thesis on a research theme different from what you had in mind, please contact the supervisor of your preferred fields or ask the contact person below for guidance 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

【Master’s Program in Public Health】 Wagatsuma Yukiko, Chair, Master’s Program in Public Health, Graduate School of Comprehensive Human Sciences, University of Tsukuba

Phone: 029-853-3007

FAX: 029-853-3483

E-mail: frontier@md.tsukuba.ac.jp

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Master’s Program in Medical Sciences

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 neuropsychiatric diseases caused by disrupted intracellular transport.
Neurobiology	志賀 隆 SHIGA Takashi	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

		<p>in axonal guidance</p> <p>⑤Analyses of neurodegenerative diseases at a molecular level</p>
Diagnostic Pathology	<p>野口 雅之 NOGUCHI Masayuki</p>	<p>1. Study about molecular mechanisms of multistep carcinogenesis including precancerous or background lesions.</p> <p>2. Study about molecular carcinogenesis and early progression based on the genomic and epigenomic abnormalities and drug development targetted the early cancer</p> <p>3. Application of fetal protein to cancer diagnosis and therapy.</p>
Experimental Pathology	<p>加藤 光保 KATO Mitsuyasu</p>	<p>①Molecular mechanisms of stemness induction in cancer development</p> <p>②Cell division kinetics of cancer stem cells by application of live imaging and three-dimensional quantitative analysis</p> <p>③Development of anti-cancer stem cell therapy using macrocyclic peptides and antibody</p>
Systems Neuroscience	()	<p>①Brain information processing mechanism of motivation and reward expectancy</p> <p>②Research on reinforcement learning and decision-making mechanism in the brain</p> <p>③Research on information coding mechanism of reward value in the brain</p> <p>④Research on visual recognition mechanism in the brain</p>
Cognitive and behavioral Neuroscience	<p>松本 正幸 MATSUMOTO Masayuki</p>	<p>①Roles of monoamine systems in cognitive, emotional and motivational brain functions</p> <p>②Brain mechanisms underlying value-based decision making</p>
Neurophysiology	<p>小金澤 禎史 KOGANEZAWA Tadachika</p>	<p>①Study on the neural regulation of the cardiovascular system</p> <p>②Study on the neural regulation of the respiratory system</p> <p>③Study on the neural regulation based cardiovascular and respiratory diseases</p>
Biochemistry , Molecular Cell Biology	<p>入江 賢児 IRIE Kenji</p>	<p>①Post-transcriptional regulation of gene expression by RNA-binding proteins</p> <p>②Molecular mechanism of mRNA localization and local translation regulating cell polarity, asymmetric cell division, and cell-fate</p> <p>③Regulation of endoplasmic reticulum stress response</p> <p>④Prospore membrane formation by vesicle docking</p>
Molecular and Developmental Biology	<p>小林 麻己人 KOBAYASHI Makoto</p>	<p>①Mechanisms underlying the formation of hematopoietic stem cells and digestive organs</p> <p>②Antioxidant mechanism of functional food ingredients</p> <p>③Screen for new antioxidant food ingredients</p> <p>④Zebrafish models of human diseases (e.g. CDG)</p>

Biochemistry , Gene Regulation	久武 幸司 HISATAKE Koji	①Molecular mechanisms of iPS cell induction ②Mechanisms of adipocyte 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 Gram positive pathogens ②Adaptation mechanisms of staphylococci ③Post-transcriptional regulation in bacteria ④Evolution of RNA regulatory networks in <i>Enterobacteria</i> (<i>Salmonella</i> / <i>E. coli</i>)
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

		<p>erythematosus, ANCA associated vasculitis, systemic sclerosis and rheumatoid arthritis.</p> <p>②Molecular mechanisms of <i>HLA</i> and other genes associated with autoimmune rheumatic diseases</p>
Genome Biology	<p>村谷 匡史 MURATANI Masafumi</p>	<p>①Integrative genome and epigenome analysis of clinical samples to understand mechanisms of cancer development and for discovery of new drug targets and biomarkers.</p> <p>②Cell-free DNA and RNA profiling to monitor environmental stress responses in internal tissues.</p>
Regenerative Medicine and Stem Cell Biology	<p>大根田 修 OHNEDA Osamu</p>	<p>①Development of Stem Cell Therapy using Mesenchymal Stem Cells</p> <p>②Functional Analysis of Hypoxia Inducible Transcription Factors in vivo</p> <p>③Analysis of Cancer Stem Cells and Tumor Stromal Cells</p>
Stem Cell Biology and Biotechnology	<p>西村 健 NISHIMURA Ken</p>	<p>①Functional analysis of transcription factors during cell reprogramming</p> <p>②Epigenetic regulation during cell reprogramming</p> <p>③Safe and efficient production of differentiated tissue cells</p>
Laboratory Animal Science	<p>杉山 文博 SUGIYAMA Fumihito</p>	<p>①Development of new technology for producing genetically modified mice.</p> <p>②Development of genetically modified mice for analyzing biological function</p> <p>③ Investigating the novel gene function in germ cell maintenance and maturation.</p>
Bioinformatics	<p>尾崎 遼 OZAKI Haruka</p>	<p>Development of computational methods for interpreting massive biological data and application of bioinformatics to biomedical problems:</p> <p>(1) AI-based prediction of genome sequence functions</p> <p>(2) Understanding of cell-to-cell variability thorough single-cell omics analyses and application to disease reasearches</p> <p>(3) Investigation and prediction of functions of non-coding regions in genome (DNA) and transcripts (RNA)</p> <p>(4) Multi-omics data analyses of biological systems</p> <p>(5) Data science of massive clinical data</p>
Medical Physics	<p>榮 武二 SAKAE Takeji</p>	<p>①Developement of techniques for high precision proton therapy</p> <p>②Developement of dose calculation system for neutron capture therapy</p> <p>③Application of techniques for photon therapy</p> <p>④Quality assurance of radiation therapy</p> <p>⑤Developement of new techniques for radiation measurement</p> <p>⑥Study for radiation protection</p> <p>⑦Basic research for acquiring information of biological function with image diagnostic techniques</p>

Environmetal Biology	熊谷 嘉人 KUMAGAI Yoshito	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 Gentic	丹羽 隆介 NIWA Ryusuke	①Studeis on interorgan communications for germline stem cell proliferation and maintenance. ②Studeis on interorgan communications for regulating aging process ③Chemical biology for developing pesticides
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
Neuroscience	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
Medicinal Chemistry / Organic Synthetic Chemistry/ Neuropharmacology	杳村 憲樹 KUTSUMURA Noriki	・Orexin receptor selective agonist/antagonist ・Opioid receptor selective agonist/antagonist 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. 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.
Molecular Behavioral Physiology	櫻井 武 SAKURAI Takeshi	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.
Functional sleep science	坂口 昌徳 SAKAGUCHI Masanori	①Function of sleep in memory consolidation. Correlation of brain plasticity and sleep ②Function of sleep in processing traumatic memory http://iiis.php.xdomain.jp/sakaguchi/www/

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
Systems Pharmacology	LAZARUS Michael	① Understanding the control of sleep and wake by motivation ② Sleep circuits as potential therapeutic targets for insomnia ③ Link between REM sleep loss and the desire for junk food ④ Elucidation of neural mechanisms of short-sleep ⑤ Analysis of the effects of short-sleep on physiological functions
Molecular Circuits of RNAi, Sleep, and Fear	LIU, Qinghua	①Comprehensive understanding of the molecular and neural bases for sleep drive ②Elucidation of the molecular and neural bases for fear and sexual behaviors
Electrophysiology and molecular biology of sleep	本城 咲季子 HONJOH Sakiko	①The dynamics of thalamocortical system across sleep/wake cycles ② Elucidation 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
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
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	()	1) Molecular mechanism in autoimmune diseases such as rheumatoid arthritis and connective tissue diseases 2) Specific regulation of autoimmune diseases 3) Approach 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
Medical Oncology and Gastroenterology	()	①Basic and clinical research on medical oncology ②Development of molecular targeted agent and novel therapy
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
	佐藤 浩昭 SATO 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
Pulmonary medicine, infection, and allergy	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
	宮内 卓 小池 朗 本間 覚 MIYAUCHI Takashi KOIKE Akira 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 ⑤Exercise physiology and cardiac rehabilitation in cardiac patients ⑥Medical 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

		<p>pathophysiology of various organs</p> <p>⑥Molecular visualization at organella level and synthetic biology</p> <p>⑦Inhibition of cholesterol synthesis, myopathy, and brain dysfunction</p> <p>⑧Fatty acid metabolism in stem cell</p>
Lipid Medicine	<p>松坂 賢 MATSUZAKA Takashi</p>	<p>①Elucidation of the role of fatty acid elongase Elovl6 in lifestyle-related diseases</p> <p>②Elucidation of the role of Elovl6 in the development and function of brain</p> <p>③Elucidation of the role of Elovl6 in cancer</p> <p>④ Examination of the effect of Elovl6 inhibition in rare diseases caused by lipid accumulation</p> <p>⑤Crystal structure analysis of Elovl6</p> <p>⑥Development of the new Elovl6 inhibitor</p>
Infectious Diseases	()	<p>1. Epidemiological investigation of serious infectious diseases and HIV infection.</p> <p>2. Molecular investigation of pathogenic and drug-resistant factors of microorganisms.</p> <p>3. Evaluation of precautions against transmissible infections diseases.</p> <p>4. Clinical studies among patients with infectious diseases</p>
Neurology	()	<p>①Molecular pathogenesis of Alzheimer's disease</p> <p>②Pathology and biochemistry of neuromuscular disorders</p> <p>③Neurobiology of neurodegenerative disorders</p> <p>④Neuro-ophthalmology of neurological disorders</p> <p>⑤Clinical and epidemiological studies of organoarsenic intoxication</p>
General Thoracic Surgery	<p>佐藤 幸夫 SATOY Yukio</p>	<p>This course is programmed to investigate on</p> <p>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.</p>
Cardiovascular Surgery	<p>平松 祐司 HIRAMATSU Yuji</p>	<p>①Development of novel microangiography system using synchrotron radiation</p> <p>②Elucidation of signal transduction in aneurysmal formation</p> <p>③Elucidation of hematological deterioration during cardiopulmonary bypass</p> <p>④Study of ischemic myocardial remodeling using knockout mice</p> <p>⑤Development of novel tissue crosslinking treatment technology</p> <p>⑥Development of vitamin K-reduced functional food</p> <p>⑦Development of valve simulation technology</p>

		<p>⑧Exploration of valve-sparing right ventricular outflow reconstruction</p> <p>⑨Study in rehabilitation medicine in reduced venous return</p> <p>⑩Regulation of gaseous microemboli in cardiopulmonary bypass</p> <p>⑪Regenerative medicine using stem cells</p> <p>⑫Production of 3D heart replicas</p>
Pediatric Surgery	増本 幸二 MASUMOTO Koji	<p>①Bioengineered tissue transfer in infants and children</p> <p>②Studies related to carcinogenesis and progression of malignant solid tumors in children</p> <p>③Pathological, molecular biological and genetic studies of the alimentary tract malformations</p> <p>④Studies of treatment for hypoplastic lungs in congenital diaphragmatic hernia</p>
Organ Transplantation, Gastroenterological and Hepatobiliary Surgery	()	<p>1) Platelet and regenerative medicine: To clarify the mechanisms of liver regeneration by platelet function and aging platelet.</p> <p>2) Drug delivery system : To investigate the mechanisms of liver injury and to develop a method of prevention by the use of a novel DDS.</p> <p>3) Surgical metabolism and wound healing: To develop a novel treatment for minimizing intestinal damage under surgical stress.</p> <p>4) Multipotential 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.</p> <p>5) CancerComprehensive elucidation of cancer genesis and metastasis by analyzing cancer stem cells, local microenvironment (incl. fibroblast and platelets), and 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:</p> <p>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	松丸 祐司 MATSUMARU Yuji	<p>1) Neurooncology</p> <p>1)-1 Neurooncology(Advanced Therapeutics): Boron neutron capture therapy(BNCT), Proton therapy, Tumor vaccination, Gene therapy, Photodynamic diagnosis and treatment (PDD, PDT)</p> <p>1)-2 Neurooncology(Diagnostics): Molecular marker and gene analysis of brain tumor(glioma, pediatric brain tumor, craniopharyngioma), Intraoperative neurophysiological monitoring (MEP, SEP, EEG), Imaging study(Intraoperative MRI, Tractography, PET)</p> <p>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</p> <p>3) Analysis of cerebral function, perfusion and metabolism using neuroimaging (functional MRI, MR spectroscopy, diffusion tensor imaging, PET)</p> <p>4) Neurorehabilitation using Robot Suit HAL, Brain machine interface</p> <p>5) Functional neurosurgery for epilepsy, involuntary movement, central pain and Headache</p> <p>6) Gene therapy and regeneration therapy using DDS (Angiogenesis, bone regeneration)</p> <p>7)Pediatric Neurosurgery: Epigenetic biomarkers from woman with neural tube defect affected pregnancies</p> <p>8)Development of advanced medical equipment and device (laser endoscope, new device of endoscopic surgery)</p> <p>9) Neuroendovascular Therapy: Development of new devices, functional neurovascular anatomy, Outcome research of neuroendovascular therapy</p>
Control of the Musculoskeletal System	山崎 正志 YAMAZAKI Masashi	<p>Clinical and basic research on following themes:</p> <p>①Treatment of spinal disorders</p> <p>②Treatment of joint disorders</p> <p>③Sports medicine</p> <p>④Regeneration of peripheral nerve</p> <p>⑤Functional improvement treatment using Robot suit HAL for musculoskeletal disorders</p>
Urology	西山 博之 NISHIYAMA Hiroyuki	<p>①Cancers of genitourinary system</p> <p>②Urodynamics</p> <p>③Andrology</p> <p>④Urolithiasis</p> <p>⑤Urinary tract infection</p>
Ophthalmology	大鹿 哲郎 OSHIKA Tetsuro	<p>①Visual science</p> <p>②Visual optics</p> <p>③Minimally invasive ocular surgery</p> <p>④Vision-related quality of life</p> <p>⑤Development of artificial vitreous</p> <p>⑥Development of new generation of OCT</p>
Otology & Equilibrium Research	()	Study on theories and methods for pathophysiological, electrophysiological and

		biochemical research in otology and cochleoneural path way.
Oral and Maxillofacial Surgery	武川 寛樹 BUKAWA Hiroki	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
Pediatrics	高田 英俊 TAKADA Hidetoshi	<ul style="list-style-type: none"> 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.
Radiation Oncology	櫻井 英幸 SAKURAI Hideyuki	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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

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	正田 純一 SHODA Junichi	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 ⑤Exercise-induced activation of antioxidative stress systems ⑥Understanding of exercise-induced inhibitory mechanism against carcinogenesis
	竹越 一博 TAKEKOSHI Kazuhiro	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	本間 真人 HONMA Masato	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	井上 貴昭 INOUE Yoshiaki	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	橋本 幸一 HASHIMOTO Koichi	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	松坂 諭 MATSUSAKA Satoshi	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	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
Forensic Medicine	本田 克也 HONDA Katsuya	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	柳 久子 YANAGI Hisako	①Preventive medicine for non-communicable diseases and frailty, Medical welfare for elderly ②Genetic counselling, Bioethics
Integrated Study on Health Information	大庭 良介 OHNIWA Ryosuke	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
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 ②Toyamagata day service ③Community care and formal caregivers, care for the family caregivers ④Community care in Mongolia ⑤Family caregiving by foreign bride and Japanese husband ⑥Qualitative research method (Grounded theory approach) , mixed method
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 ④Sociological survey in the field of medicine ⑤Methods of clinical trials ⑥Strategy to control diseases in developing countries

Social Psychiatry & Mental Health	齋藤 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, elder abuse and parent abuse by children) ③Recovery of addiction (Substance use disorder, gambling disorder and internet dependence) ④Forensic psychiatry, Criminology
Forensic Medicine	本田 克也 HONDA Katsuya	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
Medical Science and Welfare	柳 久子 YANAGI Hisako	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
Livelihood Support Science	徳田 克己 TOKUDA Katsumi	①Child care and guardians' support ②Beggars with disabilities ③Cemetery, graves and tombs
	水野 智美 MIZUNO Tomomi	①Barrier-free ②Child care and guardians' support ③Understanding persons with special needs