

# 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

### Applicant Eligibility

International applicants living abroad (including applicants formerly lived abroad and Japanese applicants living abroad)

### 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 submitting the score report. TOEFL and IELTS score reports must be dated within two years of enrollment in this University. Photocopies are accepted.

### REQUIRED DOCUMENTS

- |                                    |   |
|------------------------------------|---|
| <b>1 Application Form</b>          | Fill out the attached application form designated by University of Tsukuba. Please select which program and term you wish to apply.   |
| <b>2 Reference Form</b>            | Applications will be considered with academic references. Reference form should be accompanied with at least one letter of recommendation.  |
| <b>3 Picture</b>                   | 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).  |
| <b>4 Application Fee</b>           | 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:<br><a href="https://e-shiharai.net/english/?schoolcode=OPU5100850000000">https://e-shiharai.net/english/?schoolcode=OPU5100850000000</a><br>Due by application deadline. |
| <b>5 Certificate of Graduation</b> | Submit a certificate which fulfills our qualification requirements, Normally from the University/College (or the department) where degree was awarded.  |

<b>6 Transcript</b>	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.
<b>7 English Language Proficiency</b>	If English is not your first language, submit your TOEFL or IELTS score report. Photocopies are accepted.
<b>8 Photocopy of your passport</b>	※ 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.

<Please refer to attached list of Faculty for 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. Oral examination will be conducted online as a general rule.

## 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 admission 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), 2021 ☐ Spring (April), 2022

- ☐ Master's Program in Medical Sciences (Two-years; including Japanese applicant living abroad)
- ☐ Master's Program in Public Health (Two-years) \*Only April enrollment
- ☐ 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 2<sup>nd</sup> and 3<sup>rd</sup> choices in case the 1<sup>st</sup> choice is not selected.

	Research Field	Supervisor
1 <sup>st</sup> choice :	_____	_____
2 <sup>nd</sup> choice :	_____	_____
3 <sup>rd</sup> 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](mailto: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

(外国人出願者用)  
(for foreign applicants)

履 歴 書  
Curriculum Vitae

氏 名	フリガナ		男 (M) ・ 女 (F) Sex	生 年 月 日 Date of Birth	年 月 日	年 齢 Age		国 籍 Nationality		在留資格 Resident Status	
	ローマ字										
	Family name First Name Middle Name										
学 校 教 育 Education		学 校 名 ・ 所 在 地 Name and Address of School		正 規 の 修 学 年 数 Officially Required Number of Years of Schooling	入 学 及 び 卒 業 年 月 Year and Month of Entrance and Completion	修 業 年 数 Period of Schooling	専 攻 科 目 Major Subject if any		学 位 ・ 資 格 Diploma or Degree Awarded		
初 等 教 育 Elementary Education 小 学 校 Elementary School		学校名 Name 所在地 Location		年 yrs	入学 from 卒業 to	年 yrs					
中 等 教 育 Secondary Education 中学及び高校 Secondary School		中学 Lower	学校名 Name 所在地 Location	年 yrs	入学 from 卒業 to	年 yrs					
		高校 Upper	学校名 Name 所在地 Location	年 yrs	入学 from 卒業 to	年 yrs					
高 等 教 育 Higher Education 大 学 Undergraduate Level		学校名 Name 所在地 Location		年 yrs	入学 from 卒業 to	年 yrs					
高 等 教 育 Higher Education 大 学 院 Graduate Level		学校名 Name 所在地 Location		年 yrs	入学 from 卒業 to	年 yrs					
以上を通算した全学校教育就学年数 Total Number of Years of Schooling as given Above				年 yrs	TOTAL	年 yrs					
休学等、在籍中に修学を中断した期間（理由） from 年 yr., 月 mon. ~ to 年 yr., 月 mon. (Periods of interruption of studies, if any)											

研 究 歴 Research Activities (研究生の 経歴を含 む。)	研 究 機 関 名 Name of Research Institution	所 在 地 Address	身 分 Status	研 究 期 間 Duration of Research	年 数 yrs
				~	
				~	
				~	

※  
貼 紙 用

記入は、日本語又はローマ字体を用いてください。 Please type or print in Japanese or English



# 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](mailto:frontier@md.tsukuba.ac.jp)

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●**Master’s Program in Public Health** Page.15～Page.16

### 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 intracellular transport in neurons and glia.
Neurobiology	( )	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	( )	①Study about molecular mechanisms of multistep carcinogenesis including precancerous or background lesions. ②Study about molecular carcinogenesis and early progression based on the genomic and epigenomic abnormalities and drug development targetted the early cancer ③Application of fetal protein to cancer diagnosis and therapy.
Experimental Pathology	加藤 光保 KATO Mitsuyasu	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 ③Development of anti-cancer stem cell therapy using macrocyclic peptides and antibody
Systems Neuroscience	( )	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	松本 正幸 MATSUMOTO Masayuki	①Roles of monoamine systems in cognitive, emotional and motivational brain functions ②Brain mechanisms underlying value-based decision making
Neurophysiology	小金澤 禎史 KOGANEZAWA Tadachika	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	入江 賢児 IRIE Kenji	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 ④Prospore membrane formation by vesicle docking
Molecular and Developmental Biology	小林 麻己人 KOBAYASHI Makoto	①Development of hematopoietic stem cells ②Dietary antioxidants ③Defence systems against stresses ④Non-mammalian models of human diseases

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 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 ③ Investigating 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
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
Neuroscience of Sleep	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.

Medicinal Chemistry Chemical Biology	齊藤 毅 SAITOH Tsuyoshi	<p>We aim at creating innovative molecules contributing to biomedical sciences, such as:</p> <p>①Drugs targeting GPCRs for the treatment of insomnia, narcolepsy, pain, and mental disorders (drug design, synthesis, pharmacology)</p> <p>②Novel chemical probes to visualize biological functions</p> <p>③Opto-pharmacological probes for the flexible control of drug function</p> <p>④New chemical reactions using electron and photon as external energy.</p>
Molecular Behavioral Physiology	櫻井 武 SAKURAI Takeshi	<p>①Elucidation of physiological roles of novel neuropeptide</p> <p>②Revealing the neural circuits and neural mechanisms that work in the system that regulates emotion.</p> <p>③Studies on the neural circuits and neural mechanisms that play roles in the regulation of sleep/wakefulness states.</p> <p>④Elucidation of neural circuits and mechanisms by which body temperature and metabolisms are regulated.</p>
	平野 有沙 HIRANO Arisa	<p>①Research on oscillatory mechanism of the circadian clock and the effect of disrupted rhythms on mice.</p> <p>②Elucidation of molecular mechanism of phase-resetting of the circadian clock and circadian photo-reception.</p> <p>③Identification and functional analysis of neural circuits regulating the circadian rhythms.</p> <p>④Development of optogenetics tools.</p>
Neuroscience	KASPER EMANUEL VOGT	<ul style="list-style-type: none"> <li>• Measuring and understanding brain activity in waking and sleep</li> <li>• Determine the effect of sleep on brain circuits</li> <li>• Discover the control mechanisms for sleep depth</li> <li>• Develop new technologies and mathematical tools to study sleep function</li> </ul>
Hippocampal Functions	坂口 昌徳 SAKAGUCHI Masanori	<p>①Function of sleep in memory consolidation</p> <p>②Adult neurogenesis</p> <p>③Imaging and optogenetic analysis of hippocampal neurons <a href="https://sakaguchi-lab.org/">https://sakaguchi-lab.org/</a></p>
Brain Maturation/ Evolution	( )	<p>①Elucidation of the function of sleep focusing on brain maturation and aging</p> <p>②Elucidation of the evolutionary process of sleep based on molecular and developmental approaches</p>
Systems Pharmacology and Behavior	LAZARUS Michael	<p>①Understanding the link between sleepiness and motivation by exploring mesolimbic glia-neuron interactions</p> <p>②Sleep circuits as potential therapeutic targets for insomnia</p> <p>③Exploring the anti-psychotic effects of hyperadenosinergic activity <a href="https://www.wpiiiislazaruslab.org/">https://www.wpiiiislazaruslab.org/</a></p>

	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
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
Electrophysiology and Molecular Biology of Sleep	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-depedent 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	( )	①Molecular mechamism in autoimmunediseases such as rheumatoid arthritis and connective tissue diseases ②Specific regulation of autoimmune diseases ③Approarch to gentic 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 SATOH 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 pathophysiology of various organs ⑥Molecular visualization at organella level and synthetic biology ⑦Inhibition of cholesterol synthesis, myopathy, and brain dysfunction



Lipid Medicine	松坂 賢 MATSUZAKA Takashi	<ul style="list-style-type: none"> <li>①Role of fatty acid elongase Elovl6 in metabolic syndrome</li> <li>②Role of Elovl6 in brain, neurodegenerative disease and sphingolipidosis</li> <li>③Role of Elovl6 in cancer and stem cell</li> <li>④The structural basis of Elovl6</li> <li>⑤Development of the new Elovl6 inhibitor</li> </ul>
Infectious Diseases	( )	<ul style="list-style-type: none"> <li>①Epidemiological investigation of serious infectious diseases and HIV infection.</li> <li>②Molecular investigation of pathogenic and drug-resistant factors of microorganisms.</li> <li>③Evaluation of precautions against transmissible infections diseases.</li> <li>④Clinical studies among patients with infectious diseases</li> </ul>
Neurology	( )	<ul style="list-style-type: none"> <li>①Molecular pathogenesis of Alzheimer's disease</li> <li>②Pathology and biochemistry of neuromuscular disorders</li> <li>③Neurobiology of neurodegenerative disorders</li> <li>④Neuro-ophthalmology of neurological disorders</li> <li>⑤Clinical and epidemiological studies of organoarsenic intoxication</li> </ul>
General Thoracic Surgery	佐藤 幸夫 SATOY Yukio	<p>This course is programmed to investigate on</p> <ul style="list-style-type: none"> <li>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.</li> </ul>
Cardiovascular Surgery	平松 祐司 HIRAMATSU Yuji	<ul style="list-style-type: none"> <li>①Development of novel microangiography system using synchrotron radiation</li> <li>②Elucidation of signal transduction in aneurysmal formation</li> <li>③Elucidation of hematological deterioration during cardiopulmonary bypass</li> <li>④Study of ischemic myocardial remodeling using knockout mice</li> <li>⑤Development of novel tissue crosslinking treatment technology</li> <li>⑥Development of vitamin K-reduced functional food</li> <li>⑦Development of valve simulation technology</li> <li>⑧Exploration of valve-sparing right ventricular outflow reconstruction</li> <li>⑨Study in rehabilitation medicine in reduced venous return</li> <li>⑩Regulation of gaseous microemboli in cardiopulmonary bypass</li> <li>⑪Regenerative medicine using stem cells</li> <li>⑫Production of 3D heart replicas</li> </ul>

	鈴木 保之 SUZUKI Yasuyuki	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	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	( )	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 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: ⑥Computer assisted Surgery (CAS): To develop and apply the system of the CAS and the novel surgical education system through the medical-engineering collaboration.

Neurosurgery	松丸 祐司 MATSUMARU Yuji	<p>① <b>Neurooncology</b></p> <p>①-1 <b>Neurooncology(Advanced Therapeutics)</b>: Boron neutron capture therapy(BNCT), Proton therapy, Tumor vaccination, Gene therapy, Photodynamic diagnosis and treatment (PDD, PDT)</p> <p>①-2 <b>Neurooncology(Diagnostics)</b>: 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 <b>Cerebrovascular disease</b>: 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 <b>cerebral function, perfusion and metabolism using neuroimaging</b> (functional MRI, MR spectroscopy, diffusion tensor imaging, PET)</p> <p>④ Neurorehabilitation using <b>Robot Suit HAL</b>, Brain machine interface</p> <p>⑤ <b>Functional neurosurgery</b> for epilepsy, involuntary movement, central pain and Headache</p> <p>⑥ <b>Gene therapy and regeneration therapy</b> using DDS (Angiogenesis, bone regeneration)</p> <p>⑦ <b>Pediatric Neurosurgery</b>: Epigenetic biomarkers from woman with neural tube defect affected pregnancies</p> <p>⑧ <b>Development of advanced medical equipment and device</b> (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>
Rehabilitation Medicine	羽田 康司 HADA Yasushi	<p>①Medicine for disabilities</p> <p>②Adapted sports</p> <p>③Rehabilitation using robot suit HAL</p> <p>④Development of new rehabilitation equipment through medical-engineering collaboration</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>

		④Vision-related quality of life ⑤Development of artificial vitreous ⑥Development of new generation of OCT
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	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
	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.

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
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	松阪 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
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 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
Livelihood Support Science	( )	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
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, 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
	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	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