

**Application Guidebook for Foreign Students**  
**Graduate School of Medical Sciences (Doctor of Philosophy Degree Program)**  
**Nagoya City University**  
**for Academic Year 2023 (October Enrollment)**

**Admission policy of Graduate School of Nagoya City University**

Nagoya City University (NCU) aims to be a university in which all citizens feel pride and affinity. In graduate education, based on recognition that research guidance, for graduate students is a challenge in offering research activities; We aim to cultivate researchers and professionals who can gain advanced expertise and an interdisciplinary thinking.

With this philosophy and aim, the graduate school is widely looking for individuals who possess advanced expertise and an eagerness and aptitude for activity both within Japan and abroad, in addition to diverse skills and work experience.

[Doctor of Philosophy Degree Program in Graduate School of Medical Sciences of NCU]

《Desirable Students》

- Individuals who aspire to be an international medical researcher capable of leading medical research in future
- Individuals who intend to be a medical professional capable of establishing and practicing the most advanced medical care

《Content and level of knowledge that applicants should have been acquired》

In addition to sufficient English proficiency to understand and write papers in English, in order to perform research in medicine/life sciences, applicants are to have knowledge of life sciences and/or of basic medicine at a level of those who have completed a Master's degree program, or applicants are to have basic medical treatment technique, knowledge and experience in the clinical practice necessary to receive training on the most advanced medical care.

**1. Prescribed enrollments (Total of April and October enrollment)**

Major	No. of Enrollment	Major	No. of Enrollment
Structure and Function in Biomedical Sciences	32	Biodefense System and Comprehensive Medical Sciences	32
Biosignaling and Regulation in Medical Sciences	28	Community Medicine, Environmental Health Sciences and Medical Education	8

Note 1: Prior to submitting application documents, please contact the faculty member in charge of the department where you wish to belong, and consult with him/her regarding your application.

Note 2: In some programs, a medical license may be required for your research theme. Please consult with the faculty member beforehand with your application.

**2. Eligibility of applicants**

All applicants must satisfy at least one of the following conditions:

- (1) A person who has completed a program in medicine, dentistry, pharmacy or veterinary medicine (limited to 6 years for pharmacy and veterinary medicine) and graduated from university or is expected to graduate from university by September 2023.
- (2) A person who has completed an 18-year program (limited to programs including a course in medicine, dentistry, pharmacy or veterinary medicine) in school education in a foreign country or is expected to complete such a program by September 2023.
- (3) A person who has completed an 18-year program (limited to programs including a course in medicine, dentistry, pharmacy or veterinary medicine) in school education in a foreign country by completing in Japan the same program of correspondence education provided by the foreign country or is expected to complete such a program by September 2023.

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 Contact details: Administration officer, Administration Office, Graduate School of Medical Sciences, Nagoya City University E-mail : med-daigakuin@sec.nagoya-cu.ac.jp ***Inquiries must be made by e-mail.***

- (4) A person who has completed or is expected to complete by September, 2023 an 18-year program (only limited programs including a course in medicine, dentistry, pharmacy or veterinary medicine) of the foreign educational institution established in Japan based on the educational system of this foreign country. In such cases, the institution should be specified by the Minister of Education, Culture, Sports Sciences and Technology of Japan.
- (5) A person who has completed or is expected to complete by September, 2023 a 5-year or more year's program in the university or other tertiary institution in a foreign country assured by the government or authorized organization in the original country, or specified by the Ministry of Education, Culture, Sports, Science and Technology of Japan. The program includes the comprehensive education study provided by the foreign university in tertiary institution in Japan, or the program provided by the foreign educational institution in Japan based on the educational system of the original country. In such cases, the institution should be specified by the Ministry of Education, Culture, Sports, Science and Technology of Japan.
- (6) A person who has been designated by the Minister of Education, Culture, Sports, Science and Technology of Japan
  - a. A person who has graduated from National Defense Medical College established under the Ministry of Defense Establishment Law (Law No. 164, 1954) or is expected to graduate from said college by September 2023.
  - b. A person who has completed a master's program or is qualified to be awarded the master's degree, and been enrolled in a doctoral program (not divided into 2 segments: first 2-year for master's course and second 3-year for doctor's course) for 2 years or more, acquired 30 or more credits, received necessary research guidance, and is determined by the Graduate School of Medical Sciences to have an academic ability equivalent to or better than those who have completed a program of medicine, dentistry, pharmacy or veterinary medicine at university.
  - c. A person who has graduated from university (excluding a course in medicine, dentistry, pharmacy or veterinary medicine) or completed a 16-year program of school education in a foreign country, subsequently been engaged in research for 2 years or more at a university, research institute or the like, and is determined by the Graduate School of Medical Sciences from their achievements in such research to have an academic ability equivalent to or better than those who have completed a program of medicine, dentistry, pharmacy or veterinary medicine at university.
- (7) A person who has been enrolled in university (only limited a course in medicine, dentistry, pharmacy or veterinary medicine) for 4 years or more, or completed a 16-year program (only limited programs including a course in medicine, dentistry, pharmacy or veterinary medicine) in school education in a foreign country, and is determined by the Graduate School of Medical Sciences to have acquired the prescribed credits with excellent academic results.
- (8) A person who has determined by the Graduate School of Medical Sciences to have academic ability equivalent to or better than that those defined in (1) and will be 24 years old by September 30, 2023.

Note 1: Prior to submitting application materials to NCU, please contact the faculty member whom you would like to have as a supervisor, and consult him/her about your application.

Note 2: Some programs may require a medical license depending on your research theme. Consult with faculty member in advance, whom you would like to have as a supervisor.

### **3. Screening of Qualification for the examination under Category (6)b, (6)c, (7) or (8) as described above**

(1) Application period for "Screening of Qualification for the examination"

June 12 (Mon) – June 19 (Mon), 2023 ※must be reached at the end of period.

(2) Application documents

Applicants who fall under Category (6) b , (6) c , (7) or (8) must write in red "application qualification documents, Graduate School of Medical Sciences, Doctor of Philosophy Degree Program (October Enrollment)" on the envelope and send the following documents by registered express post, or bring them in person to the address of NCU in page3.

※If you would like to apply from overseas, please make sure to entrust your application procedure to the proxy residing in Japan. Application directly from overseas will not be accepted. Notifications from NCU will be sent to your proxy's address.

Applicants who fall under Category (6) b,

Send the following documents ; ( i ) Request for Screening of Eligibility for Examination (prescribed form of "D-5"),( ii )Resumé (prescribed form of "D-2"), ( iii )Certificate of Completion of graduate school, and ( iv ) Academic Transcript of graduate school.

Applicants who fall under Category (6) c,

Send the following documents ; ( i ) Request for Screening of Eligibility for Examination (prescribed form of “D-5” ),( ii )Resumé (prescribed form of “D-2”), ( iii ) Diploma, ( iv ) Academic Transcript , ( v )Certificate of Engagement in Research, and ( vi ) Achievement Records (prescribed form of “D-6”).

Applicants who fall under Category (7): A person who has been enrolled in university (limited to c a course in medicine, dentistry, pharmacy or veterinary medicine) for 4 years.

Send the following documents ; ( i ) Request for Screening of Eligibility for Examination (prescribed form of “D-5”),( ii )Resumé (prescribed form of “D-2”), ( iii ) Academic Transcript , ( iv ) Course Curriculum , and , ( v ) Syllabus of the university.

Applicants who fall under Category (8): A person who has been completed a 16-year program (limited to programs including a course in medicine, dentistry, pharmacy or veterinary medicine) in school education in a foreign country.

Send the following documents ; ( i ) Request for Screening of Eligibility for Examination (prescribed form of “D-5”),( ii )Resumé (prescribed form of “D-2”), ( iii ) Diploma, and ( iv ) Academic Transcript.

Applicants who fall under Category (8),

Send the following documents ; ( i ) Request for Screening of Eligibility for Examination (prescribed form of “D-5”),( ii )Resumé (prescribed form of “D-2”), and ( iii ) “Diploma” of schools after junior high school (senior high school, junior college, other school) if you have graduated from such school.

※Some documents such as “Certificate of Completion”, “Diploma”, “Academic Transcript” and “Certificate of Engagement in Research” must be written in Japanese or English, or the translated documents in either of these languages should be attached.

※D-2, D-5 and D-6 forms can be downloaded from the following website.

URL: <https://www.nagoya-cu.ac.jp/english/faculty/admissions/med/index.html>

Office hours: 9:00 – 16:00 (excluding Saturday, Sunday and National Holiday and between 12:00 – 13:00)

Send application document by registered express post or hand-delivery to:

**Student Affairs Division, Administration Office, Nagoya City University**

**1 Kawasumi, Mizuho-cho, Mizuho-ku, Nagoya, Aichi 467-8601, Japan**

### (3) Results of the screening

The results of the screening will be notified by post to applicants as early as possible.  
Applicants who passed the screening can apply to the examination.

## 4. Period of application

July 5 (Wed) – July 12 (Wed), 2023 ※must be reached at the end of period.

Office hours: 9:00 – 16:00 (excluding Saturday, Sunday and National Holiday and between 12:00 – 13:00)  
Enclose the application documents, etc. into the A4 sized envelope, stick NCU designated address label which should be filled in the details and send them by registered express mail. Instead of post, hand-delivery to the above address will be also acceptable.

Applications which cannot reach by the designated date will not be acceptable. (the date printed on the postmark is not accountable.)

If you would like to apply from overseas, please make sure to entrust your application procedure to the proxy residing in Japan. Application by post directly from overseas will not be accepted. Notifications from NCU will be sent to your proxy’s address.

Once your application documents are accepted, admission card and Test center information will be posted to applicants before July 25 (Tue). If you did not receive by those dates, please contact the administrators, Office of Medical School (refer to page1).

## 5. Application documents, etc.

Documents, etc.		Description
1	Application for admission/ Photo Identification card/ Examination Admission card	<p>[Use the prescribed form of “D-1”]</p> <ul style="list-style-type: none"> <li>• Stick your photograph on the application form. A photograph should be taken within 3 months, full-faced, upper body, no caps or hats, no background, full-color and sized 4cmx3cm.</li> <li>• Please fill in the address which you are (or a proxy is) certain to be contacted.</li> </ul>
2	Resumé	<p>[Use the prescribed form of “D-2”]</p> <ul style="list-style-type: none"> <li>• Fill in your school education history from elementary education (elementary school).</li> <li>• Provide details of your academic background including Japanese-language school, and other special training school, and of employment history, if any.</li> </ul>
3	Academic transcript	<ul style="list-style-type: none"> <li>• Academic transcript should be prepared by university you are currently enrolled in or have graduated from. If you graduated (or are expected to graduate) from the Medical School of NCU, it is not necessary to submit.</li> <li>• If you submit an application under Category (2), (3), (5), (6)c or (7) of “2. Eligibility of applicants,” and you have completed a 16-year program in school education in a foreign country, submit one of higher education (equivalent to university) completed in a foreign country.</li> <li>• A photocopy will not be acceptable (*Note 2) .</li> <li>• These documents must be written in Japanese or English, or the translated document in either of these languages should be attached. In this case, however, prepare the translation documents separated from the original transcript.</li> </ul>
4	Diploma (graduation letter)	<ul style="list-style-type: none"> <li>• Your diploma should be prepared by the university where you are enrolled or have graduated. If you graduated (or are expected to graduate) from the Medical School of NCU, it is not necessary to submit the diploma.</li> <li>• If you submit an application under Category (2), (3), (5), (6)c or (7) of “2. Eligibility of applicants,” and you have completed a 16-year program in school education in a foreign country, submit your diploma of higher education (equivalent to university) completed in a foreign country.</li> <li>• A photocopy will not be acceptable (*Note 2) .</li> <li>• These documents must be written in Japanese or English, or the translated document in either of these languages should be attached. In this case, however, prepare the translation documents separated from the original transcript.</li> </ul>
5	Letter of permission for taking examination	<p>[Use the prescribed form of “D-4”]</p> <p>If you plan to work at any place other than NCU after enrollment, submit the letter issued by your supervisor at your place of work.</p>
6	Residence certificate	<ul style="list-style-type: none"> <li>• If you are a foreign national and eligible for residence in Japan, residence certificate is required to submit.</li> <li>• If your visa status is for short-term residence, submit a photocopy of the Japan entry visa stamped on your passport.</li> <li>• If you are residing in a foreign country, submit a photocopy of your passport.</li> </ul> <p>※Residence certificate without the “Social Security and Tax Number System” is accepted. If the number is printed on the certificate, please make sure to make it invisible by using a permanent black pen.</p>
7	Examination fee (30,344 yen)	<p><b>【Paying the examination fees in Japan】</b></p> <ul style="list-style-type: none"> <li>• When paying the examination fees, fill in the transfer request form (prescribed form of NCU) with the required information, and present it with 30,344 yen (30,000yen for Examination fee + 344yen for Express mail fee for the admission card to be sent) at bank, etc. for transfer. (<i>Yucho</i> Bank does not accept this transfer. Do not use an ATM, etc.; use only a teller service.)</li> <li>• The relevant bank fees are to be paid by the applicant.</li> <li>• Submit the “Examination Fee Payment Certificate (Slip B)” received from the bank, etc. together with the other application documents. (Do not submit the “Receipt of</li> </ul>

		<p>Transfer Amount (and Transfer Fee) (Slip A),” which should be retained by you.)</p> <ul style="list-style-type: none"> <li>• The examination fee is not normally refundable in principle. However, under a few circumstances, the paid examination fee may be refunded. Confirm this on the NCU website. <ul style="list-style-type: none"> <li>ex.) The examination fee was transferred twice.</li> <li>ex.) The application documents were not submitted after the examination fees have been transferred (or the application was not accepted).</li> </ul> </li> </ul> <p><b>【Paying the examination fee from overseas】</b></p> <p>Transfer application fees of 30,344 yen (30,000yen for Examination fee + 344yen for Express mail fee for the admission card to be sent) to the following accounts by July 12 (Wed), 2023 and submit a copy of the foreign remittance request form.</p> <p>Type of Transfer: Electronic Transfer  Bank Transfer Fees: Paid by the remitter  Amount of Transfer: 30,344 yen (JPY) + all fees associated with the transfer</p> <ol style="list-style-type: none"> <li>1) <b>The remitter should pay “Japanese bank fees,” “remitter’s bank fees,” and all fees associated with the transfer.</b></li> <li>2) If you transfer money in foreign currency, your application will not be accepted.  Purpose of Transfer: Application fees</li> </ol> <p>[Application Fields]  Bank Name: The Bank of Mitsubishi UFJ, LTD  Bank Branch: Takiko Branch  Account Number: 1232518  Beneficiary Name: Nagoya City University  Address: 1 Kawasumi, Mizuho-cho, Mizuho-ku, Nagoya, Aichi 467-8601 JAPAN  Currency: JPY  Swift Code: BOTKJPJT</p>
8	Mailing label	<p>[Use the prescribed form of NCU]  The mailing label will be used to announce the examination result to the applicants.</p>
9	NCU Address label	<p>Filled in the details on the designated address label and stick it onto A4sized envelop to be sent to the Entrance Examination and Public Relations Division.</p>

Note1: If you have already submitted the documents required for application at the screening of qualification for examination, it is not necessary to submit them again when applying for the exam.

Note2: If any of your “Diploma,” “Academic Transcript” and other certificates issued by a higher educational institution in a foreign country cannot be reissued, a photocopy is acceptable. If a photocopy is submitted, the original certificates must be presented at the administration office, Entrance Examination Division when you come for the admission procedure.

Note 3: If the name written on your “Academic Transcript”, “Diploma” or other certificates is different from your current name, provide the document prove that your name has been changed (e.g., family register).

Note 4: D-2 and D-4 forms can be downloaded from the following website.  
URL: <https://www.nagoya-cu.ac.jp/english/faculty/admissions/med/index.html>

## 6. Prior consultation with the applicants with disability

Applicants who need special assistance for their disability during the examination or to complete their graduate studies should contact to the administrator, Office of Medical School, NCU by e-mail (refer to page 1).

## 7. Date and method of selection for admission

Examination date	Examination time	Examination subject	Examination place
August 1 (Tue), 2023	13:00-15:00	Medical Science and Biological Science (Written test) Question will be written in English or Japanese (to be selected by applicant when submitted application)	Lecture Room A, 11th floor, Medical School Research Building
	15:30— 17:00	English (Written test) Question will be written in English or Japanese (to be selected by applicant when submitting application) Dictionaries may be permitted except electronic one.	Lecture Room A, 11th floor, Medical School Research Building
	17:30—	Specialized subject (Interview) The applicant's specialized subject (See "Research Contents Classified by Special Fields of Study")	Room in the faculty of the specialized subject

Note: Examinees should meet at the examination place (Lecture Room A on the 11th floor of Medical School Research Building) 15 minutes prior to the start time of each examination.

## 8. Results of examination

September 4 (Mon), 2023 at 14:00

The results of the examination will be announced on the bulletin board on the 1st floor of the Medical School Research Building of NCU, and also posted to each applicant. (Please contact Administration Office of Graduate School of Medical Sciences (refer to P.1), if the result won't be delivered even one week after the announcement day.)

## 9. Admission procedure

(1) Expected date of procedure

Date of procedure of First examination is scheduled in September, 2023.

Details schedule will be noticed at the announcement of examination results.

(2) Details of procedure

The details of the procedure will be notified to you together with the results of the examination.

(3) Fees payable during the admission procedure

a. Admission fee	Nagoya City residents, etc.	232,000 yen
	Others	332,000 yen
b. Disaster and accident insurance for student education and research		3,300 yen

Note 1: The admission fee should be paid through a financial institution before commencing the admission procedure. The paid admission fee is not refundable.

Note 2: "Nagoya City residents, etc." means 'enrolled students' or 'those whose spouse or first-degree family member can prove that his/her continuous residential period in Nagoya city is at least one year before the date of admission by his/her resident certificate'.

## 10. Immigration clearance

If the legitimate immigration clearance fails to be completed by the time limit for admission, the admission may be revoked. For details of admission, contact the following for confirmation:

Immigration Information Center [ (Nagoya) ]

5-18, Shoho-cho, Minato-ku, Nagoya, Aichi 455-8601  
Tel: +81-52-559-2151

## **11. Tuition**

Annual amount 535,800 yen (267,900 yen per semester for 1<sup>st</sup> and 2<sup>nd</sup> semesters)

Note 1: After admission, tuition is to be paid twice a year (for the 1st semester and the 2nd semester) (automatic withdrawal from your account).

Note 2: Any revisions to the tuition during enrollment shall become effective immediately.

Note 3: Graduate School of Medical Sciences may charge additional cost without any notification in advance.

## **12. A waivers of tuition**

Students who can hardly afford the tuition fees with financial reasons and who are recognized to be achieving excellent results in their academic work can apply for a waiver of either full, half, or a quarter of their tuition fees.

## **13. Scholarship system**

Scholarships of the Japan Student Services Organization (JASSO) are available to graduate students.

Students wishing to apply to the programs will be referred following a review of academic achievement, research ability, etc., to determine eligibility.

## **14. Cautions**

- (1) Applications lacking necessary documents will not be accepted.
- (2) Applications found to have made false statements in their applications may have their admission revoked even after their enrollment.
- (3) Application documents, etc. will not be returned.
- (4) If your return address has been changed, notify it immediately to the administrator, Office of Medical School, NCU by e-mail (refer to page 1).
- (5) A double enrollment is prohibited under the rule.

## **15. Cooperative graduate school system**

Cooperative graduate school system is a method of providing graduate education by utilizing facilities, equipment and human resources of national, public or private off-campus research institutions acknowledged as a high research standard. The Graduate School of Medical Sciences of NCU has cooperative agreements with the National Cancer Center, the National Institute of Infectious Diseases, and the National Center for Global Health and Medicine.

### **Notifications from NCU in case of emergency**

In case of emergency (e.g., occurrence of disaster) or if changes are required to the contents of this application guidebook, students will be notified those changes through the website of NCU. Particularly as the examination day draws near, pay close attention to the website of NCU.

Applicants may also be directly contacted. In your application documents, therefore, be sure to provide contact details where you can always be reached.

NCU Website <https://www.nagoya-cu.ac.jp/>

### **Treatment of your personal information**

NCU treats your personal information in accordance with the Act on the Protection of Personal Information of Nagoya City.

#### (1) Use of your personal information

- a. Your name, address and other personal information given in application documents, etc. are used for our operations of selection for admission (e.g., application registration, selection, application result announcement, admission procedure).
- b. Your personal information used for selection for admission (e.g., academic transcript) may be used as reference material for investigative research and academic research to improve future selection for admission and graduate education. (Investigative research results are announced in such a way that individuals cannot be identified.)
- c. After you are admitted, your personal information is used for operations related to educational affairs (e.g., enrollment management, schooling guidance), student support (e.g., health control, tuition waiver, application for scholarship, job placement support), and tuition collection.

#### (2) Entrustment of operations to external business operators

The operations of (1) above may be entrusted to some external business operators under an agreement with them for proper treatment of personal information.

### **Smoke free campus**

NCU hold the smoke free policy on campus. All students are required to follow this policy, and asked to further cooperate to avoid smoking on roads and around university campuses.



**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
<b>Structure and Function in Biomedical Sciences</b>	Integrative Anatomy	(1) Molecular neurological studies aiming at comprehensive understanding of pathophysiology of neurodegenerative diseases such like amyotrophic lateral sclerosis (ALS), and studies of molecular machinery underlying the involvement of dysfunction of neuron-glia interaction in the onset and progress of those diseases. (2) Molecular neurobiological studies of homeostasis of neuroimmune system, and pathophysiology of dysfunction of neuroimmune system and its association with the etiology of neurodevelopmental disorders such as autism.
	Prof. Takatoshi Ueki	
	Anatomy and Neuroscience	Conducting seamless research into both sensory organs and the brain (1) Identification of auditory/gustatory recipient; and functional analysis using genetically-modified animals (2) Morphological / molecular biological / physiological research into the new nerves of adult brain hippocampus
	Prof. Shinya Ugawa	
	Biochemistry (TBA)	(TBA)
	Cell Biology	Cilia are antenna-like organelles which are outgrowths of the plasma membrane of eukaryotic cells. They are known to be related to a wide range of diseases. We focus on the following subjects: (1) Elucidating the mechanism of ciliogenesis (2) Understanding the regulatory mechanism of signal pathways by cilia (3) Dissecting the pathogenesis of ciliopathies (4) Discovering the roles of cilia in various diseases
	Prof. Yoichi Kato	
	Cell Physiology	Investigations into the functional and morphological characteristics of smooth muscle cells and their neighbouring cells. (1) Generation and propagation of spontaneous activity in smooth muscle. (2) Neurohumoral regulation of smooth muscle function. (3) Intrinsic properties of microvasculature in visceral organs. Major techniques employed: electrophysiology, intracellular calcium imaging and fluorescent immunohistochemistry.
	Prof. Hikaru Hashitani	
	Neurophysiology and Brain Science	Neuroscience & neurophysiological techniques are used to know physiological brain function through three projects with pathophysiological analyses. 1) the mechanism of forelimb function recovery after intracerebral hemorrhage by rehabilitation 2) the mechanism of function recovery by stem cell (ES / iPS cell) transplantation in a model of neonatal white matter injury 3) the mechanism in the formation of emotion by gut-brain interaction that is activated by umami ingestion
	Prof. Hideki Hida	
	Gastroenterological Surgery	Analysis of mechanisms of tumorigenesis, invasiveness, metastasis, and angiogenesis in digestive organ. Inflammation and cancer. Nutrition, Immunity and Inflammation. Development of techniques in laparoscopic surgery. Surgical Infection.
	Prof. Shuji Takiguchi	
	Thoracic and Pediatric Surgery	Research on the surgical and molecular target therapy for thoracic malignant tumors including lung cancer and thymic epithelial tumors. Especially focused on the clinical and scientific usefulness of minimally invasive surgery for thoracic malignancies.
	Prof. Katsuhiko Okuda	
Nephro-urology	Molecular biology for urolithiasis, endoscopic urology, prostate cancer and bone metastasis, thermotherapy for urological cancer, male infertility and reproductive urology, space urology, technological development for urological surgery, bimolecular science for urology, genetic therapy, development for voiding function, epigenetic mechanism for urological disease, congenital urological basic research, Robotics, VR technology.	
Prof. Takahiro Yasui		
Cardiovascular Surgery	Development of surgical simulation and training method using 3D printing technology and VR (Virtual Reality) technology. Research on social implementation (entrepreneurship) through medical device development. Application of hydrogen gas, which has anti-arteriosclerosis and anti-inflammatory effects, to cardiovascular diseases.	
Prof. Hisao Suda		
Breast Surgery	1. Research on molecular mechanisms of hormone dependent growth in breast cancer, 2. Research on predictive factors of endocrine therapy in breast cancer, 3. Research on "triple negative" breast cancer, 4. Research on prognostic factors in breast cancer.	
Prof. Tatsuya Toyama		

**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
<b>Structure and Function in Biomedical Sciences</b>	Pediatric urology	Basic and clinical researches about etiology, diagnosis, and treatment of pediatric or congenital disease. (1) Kidney and urinary tract: differentiation of the kidney; regenerative medicine of the kidney using ES/iPS cells; etiology of the CAKUT (congenital anomalies of the kidney and urinary tract); investigation of the histology and gene expressions in hydronephrosis or vesicoureteral reflux (2) Gonad and genitalia: molecular biological mechanism of sex differentiation, testicular development, testicular descent, spermatogenesis, and differentiation of external genitalia; differentiation of spermatogonial stem cells; endocrinology (3) Others: pediatric oncology, rare disease such as cloacal exstrophy
	Prof. Yutaro Hayashi	
	Ophthalmology and Visual Science	Basic researches to elucidate pathogenesis of vitreoretinal diseases, clinical researches for diagnosis and therapy by multi-modal imaging, and researches on artificial intelligence (AI) (1) Pathogenesis of age-related macular degeneration (lipid metabolism and roles of macrophages and mast cells) (2) Ocular drug delivery system (DDS) (intraocular sustained release of drug) (3) Regenerative medicine by use of a cell sheet (4) Multi-modal imaging to elucidate pathogenesis of retinal vein occlusion (5) Focal laser photocoagulation by navigation system to treat diabetic macular edema (6) AI-assisted imaging devices and data science in the field of Ophthalmology
	Prof. Tsutomu Yasukawa	
	Otolaryngology, Head and Neck Surgery	1. Investigation of the molecular mechanism of hereditary hearing loss and development of new treatment for sensorineural hearing loss 2. Investigation of the molecular mechanism of facial nerve palsy and development of new surgical treatment 3. Development of new diagnostic device and new treatment strategy for peripheral vestibular dysfunction 4. Investigation of the immune mechanisms of head and neck cancer and development of new treatments using oncolytic virus 5. Investigation of the mechanism of spasmodic dysphonia and development of new methods of thyroplasty
	Prof. Shinichi Iwasaki	
	Geriatric and Environmental Dermatology	Mechanism analysis and development of phototherapy for refractory skin diseases Development of treatment using dendritic cells for allergic, autoinflammatory and malignant diseases Environmental factors and skin aging Peripheral immune tolerance and cutaneous immune regulation
Prof. Akimichi Morita		
Oral and Maxillofacial Surgery	1. Basic and clinical study on jaw bone regeneration. 2. Basic and clinical study on treatment for oral precancer lesion. 3. Development of new dental implant therapy. 4. Basic and clinical study on jaw bone reconstruction and oral rehabilitation. 5. Clinical study on oral care.	
Prof. Yasuyuki Shibuya		
Plastic and reconstructive surgery	Management of impaired wound healing, soft tissue reconstruction by adipocyte-derived stem cells, lymphedema and lymphatic regeneration	
Prof. Kazuhiro Toriyama		
<b>Biosignaling and Regulation in Medical Sciences</b>	Experimental Pathology and Tumor Biology	Research Description: We principally employ cell culture and genetically engineered rat models to understand the molecular characteristics of prostate cancers, and to explore their potential as chemopreventive targets. Alternatively, the following themes are studied in subgroups. •Clinicopathological analysis for development and progression of prostate, breast, and female gynecologic tumor •The potential of a gap junctional protein in experimental and human hepatocarcinogenesis •Discovery of modifying effects against carcinogenesis and their molecular mechanisms by natural products and compounds including health food products
	Prof. Satoru Takahashi	
	Pathology and Molecular Diagnostics	Our research fields include human pathology, diagnostic pathology, molecular pathology, surgical pathology, neoplastic pathology, and pathology of the lymphoid tissue, digestive system, lung, soft tissue, head and neck (salivary gland), and thymus.
Prof. Hiroshi Inagaki		
Comparative and Experimental Medicine	We are working on the following subjects through the generating genome-editing animals and the phenotypic analyses; (1) The effect of membranous proteins recycling pathway on the early development of mammals, (2) Improvement of pregnancy rate by homeostatic and epigenetic analyses of reproductive aging.	
Prof. Hisashi Oishi		

**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
Biosignaling and Regulation in Medical Sciences	Pharmacology	Ion channels are potential targets for drug discovery in cardiovascular and inflammatory diseases and cancers. We are interested in understanding of the expression, functional role, and regulatory mechanism of ion channels (especially, Ca <sup>2+</sup> and K <sup>+</sup> channels) in cardiac, immune, and cancer cells (i.e. lymphocytes, macrophages) by electrophysiological and molecular and cellular biological approaches.
	Prof. Susumu Ohya	
	Bacteriology	Pathogenesis of virulent bacteria, such as group A streptococcus ( <i>Streptococcus pyogenes</i> ), Analysis of the function and the expression of virulence-associated proteins of bacteria, Development of novel strategies for the treatment of severe bacterial infectious diseases.
	Prof. Tadao Hasegawa	
	Immunology	(1) Immune regulation using dendritic cells and regulatory T cells (2) Cell based immune therapy using (1) (3) Inducing effective immune responses by breaking immune tolerance (4) Developing new molecular targeted immune therapy
	Prof. Sayuri Yamazaki	
	Virology	1. Comprehensive genetic analysis of Epstein-Barr virus (EBV)-associated diseases 2. Comprehensive genetic analysis of rare cancers and inherited diseases 3. Genetic diagnosis of patients with undiagnosed diseases 4. Comprehensive detection of pathogens using next-generation sequencing
	Prof. Yusuke Okuno	
	Orthopaedic Surgery	1) Mechanism of hypertrophic change of flavum in lumbar spinal stenosis. 2) Radio-hyperthermo-chemotherapy for malignant soft tissue tumors. 3) Pathophysiology of hip joint disorder in childhood. 4) Regeneration of peripheral nerve using artificial nerve. 5) Biomechanical study of ACL injured knee and ACL reconstructed knee. 6) Mechanism of pathogenesis in rheumatoid arthritis. 7) Effectiveness of drug treatment and operative therapy in rheumatoid arthritis. 8) Basic and clinical research for throwing-related shoulder and elbow injuries. 9) Regenerative medicine for post-traumatic bone and cartilage defect. 10) Molecular research of pathogenesis and therapeutics in ischemic of osteonecrosis.
	Prof. Hideki Murakami	
	Psychiatry and Cognitive-Behavioral Medicine	Development of novel treatment using cognitive behavioral therapy, interpersonal therapy, and digital technology for mood disorders, anxiety disorders, post-traumatic stress disorder, eating disorders, and cancer patients. Research on family intervention and family psychoeducation for mood disorders and schizophrenia. Development of intervention for developmental disabilities, truant children, and their families. Research on treatment optimization for refractory depression (mECT, TMS, etc.). Research in the areas of consultation liaison psychiatry including perinatal care, psycho-oncology, palliative medicine, epileptology, student mental health, and community mental health s also being conducted.
	Prof. Tatsuo Akechi	
Psycho-oncology	Supportive, Palliative and Psychosocial intervention for cancer patients with patient-public involvement; Survivorship care planning; Advance care planning; Communication; Collaborative care programs; Psycho-geriatric oncology; Family support for patients with pediatric cancer; Education for oncology staff, Implementation Science of digital mental health, Cancer control research with Big data science.	
Prof. Yosuke Uchitomi (Cooperative graduate school)		
Neurosurgery	Surgery of ischemic cerebrovascular disorder; molecular mechanism of brain lesion repair; molecular biological study of the pathological condition of subarachnoid hemorrhage, hydrocephalus and increase in intracranial pressure; development of a new method for basilar surgery, stereotaxic surgery and cerebrovascular surgery; development of a surgical treatment method for Parkinson's disease; pathological analysis and development of treatment for diffuse brain injury; development of neural function recovery by means of stem cell transfusion; development of operation assisting imaging technology; development and introduction of a new functional brain surgery	
Prof. Mitsuhiro Mase		
Rehabilitation Medicine	① The evaluation of motor and cognitive function using non-invasive methods and creating new neurorehabilitation based on the personalized functional disability ② Creating a novel personalized rehabilitation system after total hip arthroplasty using wearable cyborg ③ Creating new gait rehabilitation in parkinsonian syndrome using closed loop stimulation ④ prediction and adjust the appropriate rehabilitation ⑤ A Nationwide Survey on the current state of rehabilitation of neurodegenerative disorders	
Prof. Yoshino Ueki		
Obstetrics and Gynecology	Recurrent pregnancy loss, preimplantation genetic diagnosis; prenatal diagnosis and fetal therapy; assisted reproduction technology; genital tumor development mechanism; genetic counselling; Birth cohort of the Japan Environment and Children's study.	
Prof. Mayumi Sugiura		

**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
<b>Biosignaling and Regulation in Medical Sciences</b>	Pediatrics and Neonatology	Pathogenesis and treatment of neonatal brain injury, diagnosis and treatment of pediatric endocrinological disorders, Comprehensive management of congenital heart diseases, diagnosis and treatment of pediatric malignancy, pathogenesis of pediatric liver diseases, pathogenesis of pediatric neurological disorders, genomic medicine in pediatrics, pediatric application of regenerative medicine, evaluation and management of developmental disabilities.
	Prof. Shinji Saitoh	
<b>Biodefense System and Comprehensive Medical Sciences</b>	Neurocognitive Science	Our final goal is to elucidate molecular mechanisms underlying pathogenesis of neurocognitive disorders, particularly Alzheimer's disease (AD) and related disorders, and to develop preventive or therapeutic strategies for the disease. (1) elucidation of the role of chronic neuroinflammation (neuro-glial interaction) associating disease development (2) understanding of the brain-peripheral interaction for pathogenesis of AD (3) understanding of the disease-disease interaction for acceleration of AD pathogenesis.
	Prof. Takashi Saito	
	Glial Cell Biology	(TBA)
	(TBA)	
	Neurodevelopmental Disorder Genetics	It has been revealed that genetic background largely contributes to the pathogenesis of developmental disorders, and many responsible genes have been identified. Our group has been studying molecular genetics of neurodevelopmental disorders, intellectual disabilities and epilepsy by identification of responsible genes and analyses of model mice. We are now trying to develop therapeutic approaches including gene therapies.
	Prof. Kazuhiro Yamakawa	
	Neurotoxicology	(1) Development of a screening method of potential carcinogens by using <i>in silico</i> toxicogenomics, risk assessment of xenobiotics in foods and occupational or environmental exposure, development of a biomarker that predicts adverse side effects of medical drugs; (2) Molecular design and generation of a new antitumor drug aiming at toxicity mitigation, <i>in silico</i> analysis of its anticancer activity and activity analysis by using the wet system; (3) Development of an animal model that is highly sensitive to carcinogenesis by using transgenic technology, analysis of molecular mechanism of carcinogenesis, evaluation of extrapolative efficacy of the animal models to humans, development of a diagnostic biomarker of cancer; (4) Discovery of therapeutic agents for axonal injury
	Prof. Masumi Suzui	
	Developmental and Regenerative Neurobiology	Our lab is interested in new neurons generated by neural stem cells in the adult brain. We are studying the mechanisms for neuronal migration, maturation and survival in the physiological and pathological conditions using a variety of in vitro and in vivo systems. We are also developing technologies to promote migration and regeneration of brain cells.
	Prof. Kazunobu Sawamoto	
Gastroenterology and Metabolism	1. Exploration of novel markers of diagnosis and treatment efficacy for digestive organ cancer, 2. Development of diagnostic method and treatment using photodynamics for gastrointestinal cancer, 3. Development of novel treatment for inflammatory bowel disease, 4. Development of novel diagnostic method and treatment for IgG4-related disease and autoimmune pancreatitis, 5. Development of treatment using metallic stent for malignant stenosis of biliary and gastrointestinal tract, and multidisciplinary opinion including dynamic standpoint, 6. Development of treatment for non-alcoholic steatohepatitis, 7. Development of treatment for the prevention of hepatocarcinogenesis, 8. Viral and human genomic analysis in viral hepatitis, 9. Investigation of pathogenesis and exploration of novel target molecules of treatment for diabetes mellitus, dyslipidemia, obesity and endocrine disease	
Prof. Hiromi Kataoka		
Respiratory Medicine, Allergy and Clinical Immunology	<ul style="list-style-type: none"> <li>•Chronic airway deceases (asthma, chronic cough, COPD and chronic airways infection): epidemiology, disease concept, pathophysiology, genetic determinants, CT image analysis, diagnosis and treatment.</li> <li>•Lung cancer: molecular pathobiology, susceptibility to anticancer agents,and multicenter large-scale studies.</li> <li>•Respiratory infection (nontuberculous mycobacteriosis, pneumonia): epidemiology, pathophysiology, CT image analysis, diagnosis and treatment.</li> <li>•Interstitial lung diseases: pathophysiology, CT image analysis and treatment.</li> <li>•Relationship of respiratory symptoms such as cough and gastroesophageal reflux disease.</li> <li>•Connective tissue disorders: search of novel autoimmune molecules, pathophysiology analysis and diagnosis using clinical samples, and treatment.</li> </ul>	
Prof. Akio Niimi		
Cardioangiology	1. Development of early diagnosis algorithm and treatment for heart failure, 2. Development of Nagoya City model for chronic heart failure treatment, 3. Development of 4D speckle tracking echocardiography, 4. Research on acute kidney injury in acute heart failure, 5. Development of intra-renal circulation imaging system in heart disease, 6. national research of cardiac amyloidosis to develop a new diagnostic system, 7. Development of a method to evaluate atrial histology and its application to the treatment of atrial fibrillation, 8. Research on atrial function and heart failure, 9. Research on lipid abnormalities and diabetes-related to coronary artery disease, 10. Research on the significance of central artery pressure in cardiovascular coupling.	
Prof. Yoshihiro Seo		

**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
Biodefense System and Comprehensive Medical Sciences	Nephrology	1. Complications of chronic kidney disease, especially renal anemia and mineral bone disorders 2. Research on diabetic kidney disease and congestive kidney focusing on the kidney size 3. Research on acute kidney injury 4. Research on pathophysiology of cardiorenal syndrome
	Prof. Takayuki Hamano	
	Neurology	Clinical study of the pathological condition of cerebrovascular accidents and intractable nervous diseases; development of model animal preparation method for neurodegenerative diseases; development of gene therapy for intractable nervous disease; clarification of memory and recall mechanisms; clarification of molecular biological pathogenic mechanism and development of treatment method for Alzheimer's disease and vascular dementia
	Prof. Noriyuki Matsukawa	
	Community-based Medical Education	Establishment of teaching methods and systems by the educational general medical team. The studies of educational methods with medical simulators. Establishment of the efficient education of general medicine. The investigation about the usefulness of medical network system in community medical care system. Establishment of the effective and efficient preventive medicine with cooperation in community medical care system.
	Prof. Hiroataka Ohara	
	Anesthesiology and Intensive Care Medicine	1. Elucidation of the mechanisms of neurocognitive dysfunction in the perioperative period 2. Elucidation of the pathogenesis of central nervous system disorders caused by sepsis and development of treatment methods, 3. Elucidation of the pathogenesis of chronic pain and development of treatment methods 4. Elucidation of the mechanisms of chronic pain in the oral region and development of treatment methods 5. Basic research on nutritional management for critically ill patients 6. Clinical research in the areas of anesthesia and intensive care
	Prof. Kazuya Sobue	
	Radiology	1. Research on advanced imaging modalities, 2. Development of new radiology service with artificial intelligence, 3. Creation of new treatment in interventional radiology, 4. Optimization and standardization of radiation treatment including proton beam therapy, 5. Clarification of the effect of radiation with biology
	Prof. Akio Hiwatashi	
	Hematology & Oncology	1. Dissection of molecular pathogenesis of hematopoietic neoplasms, identification of novel molecular targets, exploration of biomarkers predicting for the efficacy and adverse events of molecular targeting therapies, and mechanisms responsible for the drug resistance 2. Development of novel immune therapies against cancer with therapeutic antibodies or chimeric antigen receptor T-cell (CAR-T) therapies 3. Planning and conducting preclinical studies and clinical trials against cancer
	Prof. Shinsuke Iida	
	Clinical Pharmaceutics	1. Analysis of risk factor of side effect on chemotherapy. 2. Efficacy evaluation of new therapeutic drug monitoring software of antibacterial agents. 3. Analysis of the relationship between urinary / kidney diseases and drugs and development of new treatments. 4. Clinical research based on drug treatment issues, etc.
Prof. Yoko Hibi		
Cognitive Function and Pathology *Endowed course	1. Elucidation of neural mechanisms of learning and memory and emotion. Analysis of neural networks by measurement and manipulation of neural activity in vivo and selective visualization of neural circuits. 2. Elucidation of the pathophysiology of neurological and psychiatric disorders related to disruption of memory and emotion. Development of novel therapeutic and preventive methods for these disorders.	
Prof. Hiroshi Nomura		
Department of Advancing Acute Medicine	(Prof. Hiroshi Sasano) Breathing-circulation cooperation (heart rate, blood flow variability analysis, physiology of respiratory sinus arrhythmia), the development of clinical devices (ultrasound-guided puncture, oxygen administration), peripherally inserted central venous catheter, medical simulation education.	
Prof. Hiroshi Sasano		
Prof. Tomonori Hattori	(Prof. Tomonori Hattori) The effect of immune regeneration by bone marrow transplant for the immunoparalysis in sepsis. The effect of treatment by PMX-DHP and HDF for septic shock patients.	
Department of Emergency and Critical Care	Clinical study of sepsis and infection control. Clinical study of trauma and critical care. Study of disaster reduction and medicine Study of healthcare art at emergency room	
Prof. Asako Matsushima		

**Research Contents Classified by Specialized Fields of Study**

Major	Specialized field of study	Research contents
	Faculty member in charge	
Community Medicine, Environmental Health Sciences and Medical Education	Occupational and Environmental Health ..... Prof. Michihiro Kamijima	(1) Risk assessment of environmental chemicals (research on their health effects, mechanisms of action, exposure characterization), (2) Epidemiologic study on children's environmental health
	Public Health ..... Prof. Sadao Suzuki	The department specializes in epidemiology. The target outcome includes lifestyle-related diseases such as cancer, diabetes mellitus, and metabolic syndrome, QOL, health status, and death. Using a statistical approach, we discuss the relationship between these outcome and genetic and/or environmental factors such as life styles, psychosocial factors, and genetic polymorphism including the interaction. We also work on evaluation and comparison of diagnostic tests, clinical epidemiology and descriptive epidemiology of intractable diseases.
	Forensic Medicine ..... Prof. Yasuhito Aoki	Forensic genetics. Forensic pathology. Forensic analysis of digital imaging of human body.
	Medical Education ..... Prof. Osamu Takakuwa	Development of medical and healthcare education systems among multiple medical institutes. Development of effective faculty developments for clinicians. Development and assessment for new interprofessional education system.
	Department of Medical Innovation ..... Prof. Takeshi Kamiya	1. Pathophysiology, epidemiology and new therapeutic strategies of functional gastrointestinal disorders 2. Methodiology and pedagogy of clinical studies 3. Basic studies on the mechanisms of visceral perception 4. Database studies on gastrointestinal and circulatory diseases 5. Pathophysiology and new therapeutic strategies of heart failure 6. Clinical studies of emerging infectious diseases by mathematical models 7. International studies of prevention and treatment on peuminia and ARDS