

# UNIVERSITY OF THE RYUKYUS

GRADUATE SCHOOL OF MEDICINE,  
GRADUATE SCHOOL OF HEALTH SCIENCES,  
FACULTY OF MEDICINE  
SCHOOL OF MEDICINE, SCHOOL OF HEALTH SCIENCES,  
AND UNIVERSITY HOSPITAL

## GUIDE BOOK

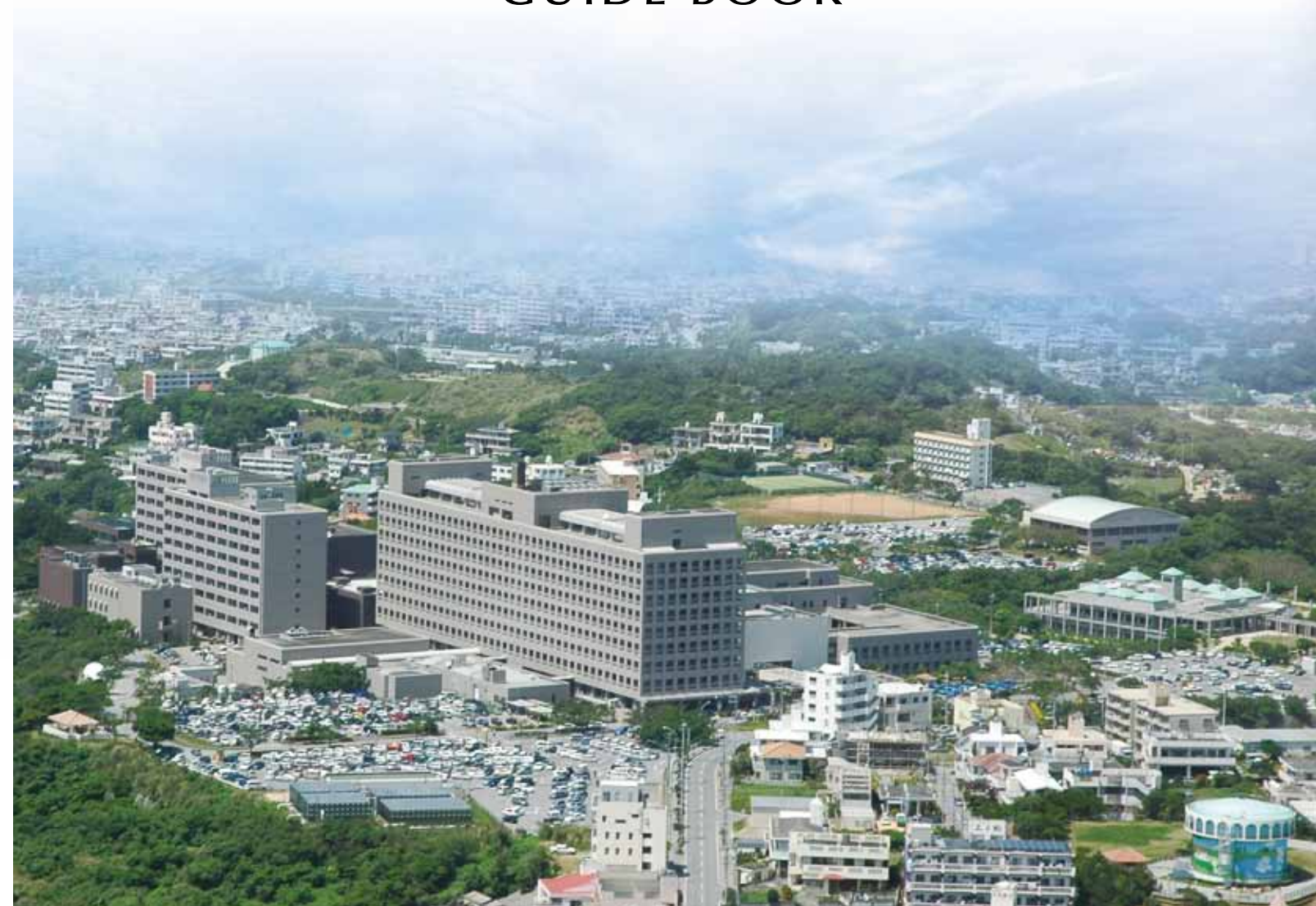


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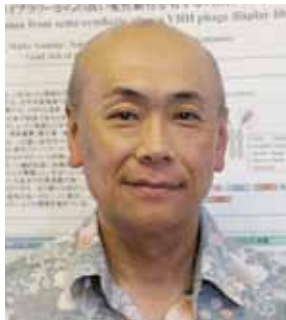




# GRADUATE SCHOOL OF MEDICINE, GRADUATE SCHOOL OF HEALTH SCIENCES, FACULTY OF MEDICINE SCHOOL OF MEDICINE, SCHOOL OF HEALTH SCIENCES,



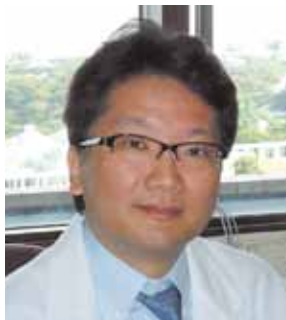
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Vice-Dean,  
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Head, School of Medicine  
Chitoshi Takayama, M.D., Ph.D.



Dean, Graduate School of Health Sciences,  
School of Health Sciences  
Takuya Fukushima, M.D., Ph.D.

## FOUNDING CONCEPT

The essential purpose of the Faculty of Medicine is to nurture physicians and medical science specialists who are willing to develop their specialized knowledge and skills with high ethical standards in professional research areas, and to carry out the research in all fields of medicine and medical science by responding adequately to the latest progress and social problems.

In addition, the Faculty is obligated to improve medical care in the local community, to resolve medical and healthcare problems, and to extend its promotional activities to countries in the Asian and Pacific regions based on recognition of the natural environmental conditions, geographic location and historical situation in the Ryukyu Islands.



# UNIVERSITY HOSPITAL

## CONCEPT & BASIC POLICY

As the University Hospital, we aim to develop international-minded medical staff who will provide high quality healthcare in accordance with our patients' requirements. We also aim to provide optimal medical care with profound compassion for patients, and also to improve the community healthcare and welfare. As the only designated "Advanced Treatment Hospital" in the Okinawa Prefecture, we have demonstrated a firm commitment to provide innovative and advanced medical care.

Our basic policies are:  
1) to provide high quality medical treatment to ensure the dignity of life;  
2) to improve the quality of community healthcare and welfare through cooperation with the other medical and allied health organizations;  
3) to develop and apply advanced medical knowledge and technologies; and  
4) to nurture physicians and medical staff who possess international viewpoint and outlook.

Since being appointed the community AIDS Clinical Center (March 2007), and the Landmark Hospital for cancer therapy (February 2008), and liver diseases (November 2009), and for medical care in remote areas (March 2011), the University Hospital functions as the pivotal center for advanced medical care in Okinawa Prefecture. As the leading hospital in Southeast Asia, it is also expected to contribute to improving community healthcare and to provide updated medical treatments, especially in the fields of infectious diseases, cancer and lifestyle-related diseases.



Director,  
Jiro Fujita, M.D., Ph.D.



Vice-Director,  
Tadashi Nishimaki, M.D., Ph.D.



Vice-Director,  
Yusuke Ohya, M.D., Ph.D.



Vice-Director,  
Mikio Suzuki, M.D., Ph.D.



Vice-Director,  
Manabu Kakinohana, M.D., Ph.D.



Vice-Director,  
Chiyomi Omine,  
Certified Nurse Administrator





# Our characteristics on Education

## The development of human resources in islands of Okinawa with a high life expectancy

Okinawa Prefecture, located at the center point between Southeast Asia and mainland Japan, was previously recognized as a healthy society with a high life expectancy. However, the average lifespan has dropped in Okinawa, down from first place in Japan to third for women and thirtieth for men. This situation, known as the "330 Shock", has caused confusion and worry among medical personnel in Okinawa. Lifestyle-related diseases due to dietary change are thought to be one of the main causes. Alongside increasing aging of the population on remote islands, improvement of medical services for the elderly have become a more important issue.

The School of Health Sciences aims to improve health and longevity, and offers hospital-based medical care for residents

of Okinawa Prefecture through its education of healthcare professionals. Its nursing and medical laboratory-based courses train staff to help provide community medicine and health services. Undergraduate students gain comprehensive knowledge in lectures given by instructors in various fields and master practical care skills by training in community medical facilities. Through exchange agreements with institutions in Southeast Asian countries, they also learn to consider local issues from a global viewpoint.

The School of Health Sciences endeavors to develop leaders of community medicine in Okinawa Prefecture, teaching staff that can work in research and education, and talented global human resources.

## The international academic exchange with the Asia - Pacific region

The Graduate School of Health Sciences, comprising the areas of Human Health Promotion, and International and Island Health, is conducting research into human health and longevity in Okinawa Prefecture, the physical, psychosocial, and cultural factors that influence health, the development of health resources and advanced healthcare technology, and island health in the Asia-Pacific region. The results obtained from research relating to the subtropical physical environment are helping the promotion of health services in Asia-Pacific and Africa and the development of medical staff in remote areas.

We are currently focusing on promoting the exchange of human resources with institutions in the Asia-Pacific region. A memorandum of understanding was signed with the University of the Philippines, Chiang Mai University in Thailand, and the University of Health Sciences in Lao PDR to start collaboration efforts and develop closer partnerships. We are also inviting graduate students from these universities to participate in a

special program for government-sponsored foreign students and to join collaborative global health studies.

The mission of the Graduate School of Health Sciences is to develop talented human resources for global health, acting as researchers and leaders in universities, core hospitals, and international organizations such as the Japan International Cooperation Agency (JICA) and World Health Organization (WHO).



## Okinawa Clinical Simulation Center

Okinawa Clinical Simulation Center is established in March 2012, for the purpose of improving medical education, patient safety and clinical skill training by the support from Okinawa Prefecture. This center has been used by all medical staff in medical institutes and educational institutes inside and outside of Okinawa. Simulation-based medical education has been accepted as an innovated teaching method using a simulated clinical situation and circumstances. Our institute is three stories, and the total floor area is 2,150m<sup>2</sup>. We have 21 training rooms, and six debriefing/meeting rooms with variety of simulators and medical devices which can be used for the purpose from basic skill trainings to advanced simulation trainings.

The total number of users of our institute in one year has exceeded 18,000. Users are medical students, nursing students, doctors, nurses, pharmacists, dentists, nursing teachers, clinical laboratory technicians, and clinical engineering technicians.

Not only providing those facilities, but we have held our original courses to develop the teaching skills of the simulation educators for years. Instructors and teachers, who had taken

our courses are now coaching in their institutions for improving the levels of medical systems in Okinawa.

Simulation-based education is most suitable for understanding team works and patient safety, those are the most important missions for healthcare providers to improve. We hope that more medical and educational institutions will utilize our facilities for that purpose, and contributing to patients benefit.

For more detailed information, visit our website <http://okinawa-clinical-sim.org/>



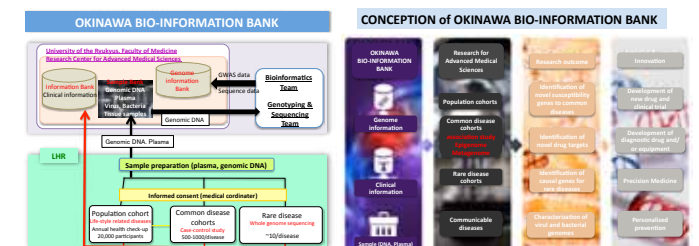
# Our characteristics on Research

## Okinawa Bio-information Bank Project toward future precision medicine

People in Okinawa used to have healthy life-style, and highest longevity in Japan. However, introduction of western life-style 20 years prior to Japan main-islands results in higher prevalence of obesity and lifestyle-related diseases, such as diabetes mellitus, and mortality rates for middle aged people in Okinawa are now highest in Japan.

During last decade, advances in technologies and accumulation of human genomic information have provided a large number of information regarding susceptibility to common diseases or responsiveness and/or adverse effects to several drugs, those are considered useful to establish a future precision medicine. It has been also well known that genetic backgrounds vary among different ethnic populations, and people living in Okinawa have been shown to possess a unique genetic background, which is clearly different from that in people from Japan main-islands. Therefore, genetic studies using an Okinawa population are required to provide useful information for the establishment of precision medicine in Okinawa.

Okinawa Bio-information Bank Project has been started under the support of Okinawa Prefecture and Japanese government. We will collect about 20,000 genomic DNA samples and clinical information from participants living in Okinawa. We think that the resource of Okinawa Bio-information Bank contributes to the identification of new therapeutic targets, elucidation of disease mechanism. In addition, promotion of collaboration using this resource with research institutes or pharmaceutical companies is useful to



## A novel approach toward the reconstruction of healthy longevity in Okinawa via the cutting edge science of brain and molecular nutrition

Okinawa, which was once an island of the longest-lived people in the world, has recently ranked near the top of all Japanese prefectures in terms of the proportion of obese people and patients with type 2 diabetes mellitus, and the average lifespan of people has been rapidly decreasing (the Okinawa crisis). High-fat meals, which are rare in the wild, disrupt the appetite control mechanism of the brain. The similarity between the dependence on high-fat meals and addiction to narcotics, alcohol, tobacco, gamble and internet is attracting social and academic attention.

Endoplasmic reticulum (ER) stress in the hypothalamus, the center of appetite, is aggravated by excessive intake of animal fat, further increasing the preference for animal fat. Of note, among various kinds of natural foods,  $\gamma$ -oryzanol, which is contained specifically and abundantly in brown rice, functions as a molecular chaperone and decreases ER stress in hypothalamus.  $\gamma$ -Oryzanol also alleviates ER stress in pancreatic  $\beta$  cells, thereby improving glucose-stimulated insulin secretion. Furthermore,  $\gamma$ -oryzanol ameliorates dysbiosis of gut microbiota, resulting in augmented production of short chain fatty acids (Fig.1).

Supported by a couple of national strategic research grants, we are now investigating the potential benefits of

$\gamma$ -oryzanol in addiction to alcohol and nicotine, cognitive impairment and decreased physical activity, all of which are often associated with obesity and diabetes (Fig.2). A series of our research has recently been highlighted in Nature journal (30th of March, 2017, spotlight on food science in Japan) (Fig.3). Furthermore, our latest work demonstrating that  $\gamma$ -oryzanol ameliorates HFD-induced DNA hypermethylation of the promoter region of type 2 dopamine receptor (D2R) in the striatum of mice was selected for a cover story of Diabetologia, August issue of 2017. Our experimental paradigm highlights  $\gamma$ -oryzanol as a promising anti-obesity substance with the distinct property of being a novel epigenetic modulator, which does transform insatiable brain into satisfied brain (Fig.4).

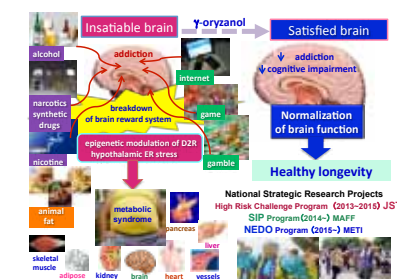


Figure 2

Brown rice-derived bioactive substance,  $\gamma$ -oryzanol exerts multi-factorial, metabolically-beneficial impact on brain, pancreatic islets and gut microbiota

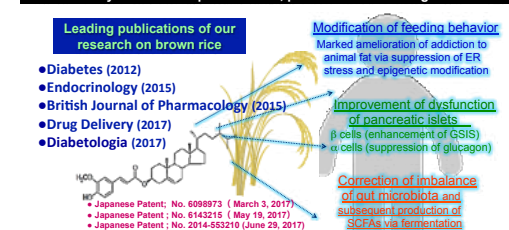


Figure 1



Figure 3



Figure 4

# Our characteristics on Practice

## Aiming to be at the forefront of regenerative medicine

University of the Ryukyus Hospital is pushing ahead with research on regenerative medicine as the only university hospital in Okinawa Prefecture. Towards achieving the practical application of regenerative medicine using Adipose Derived Stem Cells (ADSCs), we launched our Cell Processing Center (CPC) in March 2015. This paved the way for implementing regenerative medicine in which adipose tissue is harvested from a patient, ADSCs are extracted and cultured on a large scale at CPC, and then transplanted back into the patient.

In March 2016, we performed the first successful case of ADSCs transplantation to a patient, who was suffering from malar deformity after an operation for maxillary sinus carcinoma. In performing regenerative therapy in which cultured ADSCs were used to correct facial deformity for the first time in Japan, our team made a substantial contribution to the development of regenerative medicine.

By conducting groundbreaking research and developing leading-edge technology for regenerative medicine, we are establishing University of the Ryukyus Hospital as a leader in advanced medical technology, both at home and abroad. The

mission of our regenerative medicine initiative is to bring a bright future to many patients suffering from intractable diseases.



## About FIMACC

FIMACC (Functional Imaging and Communication Center) has been in operation as PET (Positron Emission Tomography) scan section since March 2013, and is adjacent to University of the Ryukyus Hospital, where we conduct FDG-PET scan. PET with FDG (fluorodeoxyglucose) provides valuable functional information based on the increase glucose uptake and glycolysis of cancer cells. It is a valuable tool for staging and restaging of various cancers without little side effect. As a characteristic of our section, we are actively conducting FDG-PET for urological tumor that is often difficult to evaluate. Many patients are referred for FDG-PET scan, the radiologists can read images and prepare reports promptly. In addition, we can conduct FDG-PET scan for evaluation of cardiac sarcoidosis. And also we would like to provide PET examination as a medical checkup.



# Future directions

## Okinawa Health Sentinel Sites

Faculty of medicine and university hospital are scheduled to move to a new campus in West Futenma, Ginowan City in 2024. To establish a leading position in Asia-Pacific region, we are focusing on following actions; (1) Amelioration in

state-of-the-art medical care and research activity, (2) Support for promoting the standard of medical care in communities, (3) Activate international research cooperation, and (4) Enhance the educational level of medical care staff and students.

# Figures

## The School

School / Graduate School	Department
Medicine	42 courses
Health Sciences	6 courses (18 fields)

## Academic staff in the Faculty

(as of May 1, 2017)

Professors	Associate Professors	Lecturers	Assistant Professors	Total
57	42	40	166	305

## Students

(as of May 1, 2017)

(as of May 1, 2017)

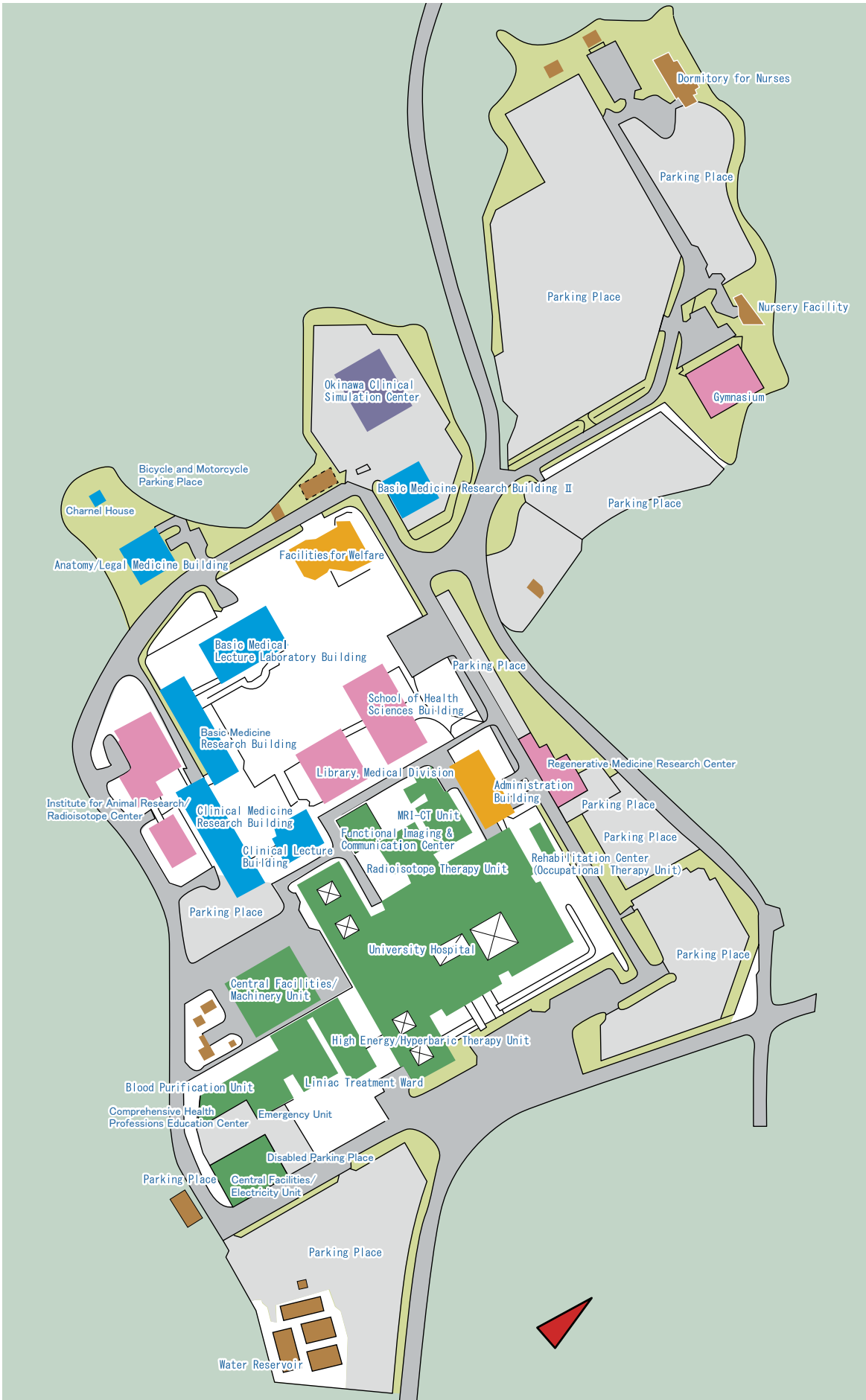
School	Number	Total	Graduate School		Number	Total
				Course		
Medicine	722	972	Medicine	Master's	15	249
Health Sciences	250			Doctoral	180	
			Health Sciences	Master's	27	
				Doctoral	27	

## University Hospital

Advanced Treatment Hospital (Cancer, AIDS, Liver diseases, Specific infectious diseases, and Tuberculosis)	
Number of beds (including beds for patients with tuberculosis)	600
Average bed occupancy rate (2016)	87.7%
Number of doctors (as of May 1, 2017)	203
Number of outpatients per day (2016)	1,172.9
Number of operations per year (2016)	13,096
Number of anesthesia per year (2016)	7,648



# Campus Map



## Access to University of the Ryukyus

**Monorail+Bus (or taxi)**

Naha Airport		Naha Airport	
Shuri Station		Gibo Station	
Monorail 27 minutes		Monorail 25 minutes	
<b>Shuri Station</b>		<b>Gibo Station</b>	
<b>94</b>		<b>97</b>	
About 15 minutes		About 30 minutes	
About 25 minutes			
<b>Faculty of Medicine and University Hospital</b>		<b>Faculty of Medicine and University Hospital</b>	

Name of Destination	
<b>94</b>	Shuri Station Ryudai Rapid Line (Downline(Toward Torihori 1-chome, Arakawa))
<b>97</b>	Ryudai Line

■ Please allow enough time for visit because buses may be delayed due to the traffic conditions.