

# Fukushima Global Medical Science Center

Fukushima Medical University

2023



公立大学法人

福島県立医科大学

# Fukushima Global Medical Science Center

**Supporting Fukushima's revitalization from a medical perspective and aiming to share the experiences and lessons we have learned from the disaster with the world**

**HAZAMA Akihiro, MD, PhD,**  
Executive Director



The Fukushima Global Medical Science Center (FGMSC) was established as an organization to restore and revitalize the community through the field of medical care and disseminate its recovery status to the world. The Center serves three main roles: (1) maintain the health of the residents of Fukushima, (2) promote cutting-edge research and the revitalization of industries, (3) provide highly advanced medical care. FGMSC is comprised of five sub-centers, two divisions, and medical support for the Futaba area (through the Futaba Emergency and General Medicine Support Center). The Radiation Medical Science Center for the Fukushima Health Management Survey and the Health Promotion Center aim to protect over the long-term the health of prefectural residents in the aftermath of the Great East Japan Earthquake and nuclear accident and improve the health of prefectural residents and increase their healthy life expectancy. The Translational Research Center and Advanced Clinical Research Center develop new diagnostic technologies, tests, and therapeutic drugs to nurture growth in the medical industries, which will lead to revitalization of the region. The Advanced Clinical Division and the Thyroid and Endocrine Center uses advanced medical equipment for the early detection of illnesses, and they cooperate with each field to provide advanced, specialized medical treatment. The Education and Human Resource Development Division works to support each center and division, cooperates with international institutions, and cultivates the next generation of medical professionals. We have an obligation to share our experiences and the lessons we have learned from the disaster and the nuclear accident with the people of the world and to preserve these things for future generations. We will continue to work tirelessly to achieve the Fukushima Global Medical Science Center's mission.

## Maintain the health of the residents of Fukushima



Radiation Medical Science Center for the Fukushima Health Management Survey



Health Promotion Center



Medical Support for Futaba area

## Promote cutting-edge research and the revitalization of industries



Advanced Clinical Research Center



Translational Research Center

## Provide highly advanced medical care



Thyroid and Endocrine Center



Advanced Clinical Division

## Cultivate the next generation medical care professionals



Education and Human Resource Development Division

## Radiation Medical Science Center for the Fukushima Health Management Survey

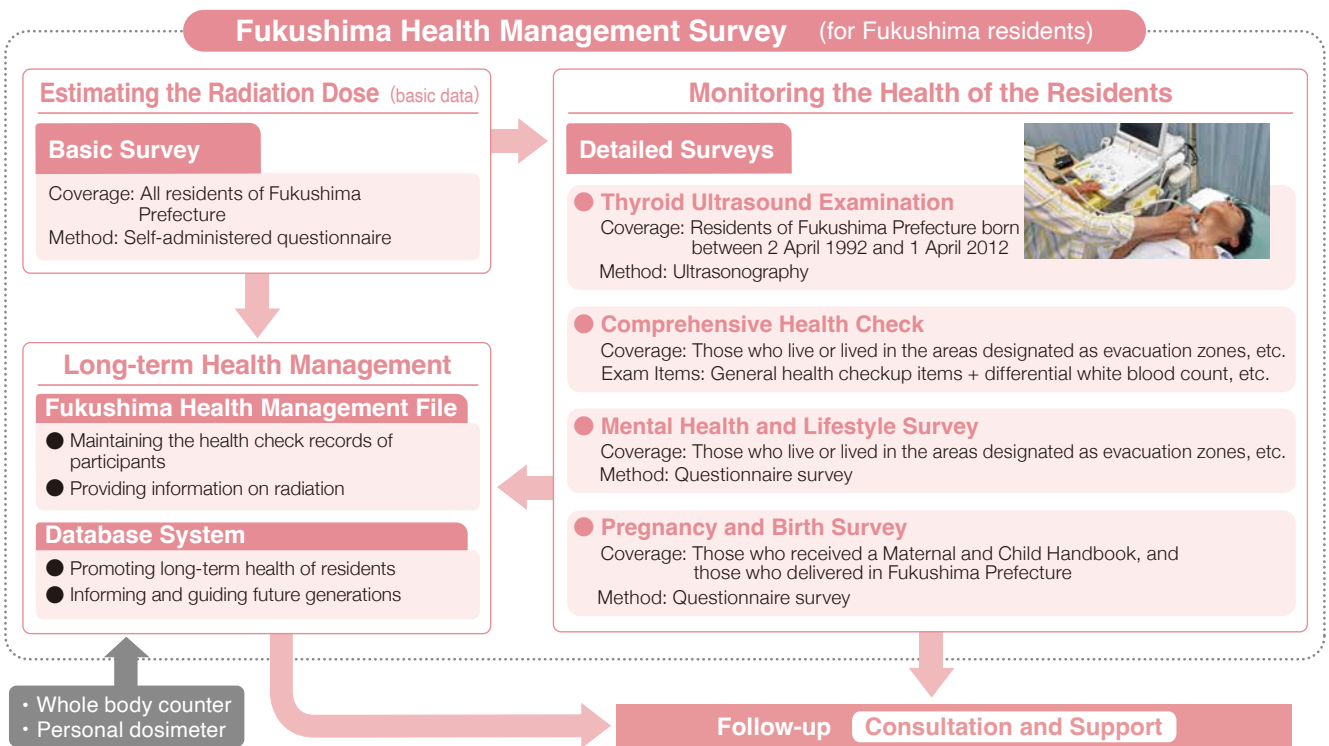
### Serving to maintain and improve the health of Fukushima's citizens through appropriate support and timely dissemination of information

**SEIJI Yasumura, MD, PhD, Executive Director**

Fukushima Prefecture has been conducting its "Fukushima Health Management Survey" in response to Japan's 2011 earthquake, tsunami, and Fukushima Daiichi Nuclear Power Plant accident, which prompted evacuation from areas affected by environmental release of radioactive materials. The Center has been tasked by Fukushima Prefecture to conduct this survey, through which we attend to the long-term health of prefectural citizens by ascertaining their health status and providing appropriate prevention, treatment, and support.

Through its implementation, we are working to continuously improve the Survey with the cooperation and support of administrative authorities and academic organizations, including universities and other research entities, here in Japan and abroad.

Twelve years after the Survey began, we have returned to the basics of "surveying to provide appropriate support" with a focus on disseminating trustworthy information through research related to the 2023 "Accumulation and dissemination of data and findings related to nuclear disasters" initiative of F-REI, the Fukushima institute for Research, Education and Innovation. Going forward, we will strive to continuously improve the survey in order to maintain and enhance the health of our citizens.



The Center strives to promote understanding of the current status and results of the Fukushima Health Management Survey by issuing reports and holding international symposiums. We also exhibit at health-related events held within Fukushima Prefecture and present the results of the survey.



Report



International symposium



Exhibiting at an event



## Advanced Clinical Research Center

### Developing new nuclear medicine diagnostics and therapy using cyclotron and PET scanning systems

The Center was established as a core facility within Fukushima Prefecture to provide early diagnosis of various diseases, mainly using PET-MRI and PET/CT diagnostic imaging. The Center is also a research facility that can conduct everything from the manufacture and synthesis of radiopharmaceuticals, to non-clinical studies and clinical research and trials. PET-MRI, first introduced to Japan by this Center in 2013, contributes to ultra-early detection and diagnosis by providing high-precision, high-quality images of cancer and diseases of the heart, brain, and nervous system.

In addition, equipped with Japan's only medium-sized cyclotron for the manufacture of medical radioisotopes (nuclides), the Center has succeeded in the stable production of Astatine-211 ( $^{211}\text{At}$ ), which is attracting attention as an alpha-emitting nuclide that has the effect of killing cancer cells, in quantities and quality levels that can be used in nuclear medical treatment, and we are moving ahead with the research and development and clinical trials of therapeutic drugs.

In order to further develop our achievements in research and development to date, we are collaborating with the Fukushima Institute for Research, Education and Innovation (F-REI), established by the government in Hamadori, Fukushima Prefecture, in April 2023, and are actively engaged in research and in the nurturing of high-level human talent involved in the research. Going forward, we will continue to contribute to the maintenance and promotion of the health of the citizens of Fukushima prefecture as one of Japan's finest research and development centers for radiopharmaceuticals and nuclear medicine.



Medium-size cyclotron



PET/SPECT/CT for small animals



PET-MRI for clinical use

### One-stop system from manufacturing to clinical research and trials

#### Manufacture and synthesis of radiopharmaceuticals

The Center has five laboratories (hot labs) where various radioactive drugs are manufactured and synthesized. We also have two cyclotrons, one small and one medium-sized, where we manufacture positron-emitting nuclides used in PET diagnosis, as well as Astatine-211 ( $^{211}\text{At}$ ), which is recently attracting attention as an alpha-emitting nuclide for nuclear medicine treatment, and are advancing research into therapeutic drugs.

#### Non-clinical studies

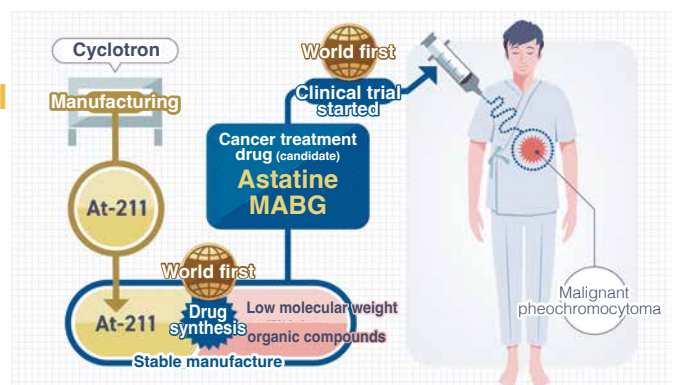
We have established environments in which advanced cell and animal experiments can be conducted, such as a specific pathogen-free environment (SPF), and conduct pharmacokinetic and pharmacological studies using radionuclides. In addition, the Center is equipped with advanced imaging equipment and high-precision measurement equipment, and we use a variety of methods to evaluate radioactive drugs that are candidates for development.

#### Clinical research and trials

Because we can manufacture radiopharmaceuticals in-house, we are able to conduct clinical research on therapeutic drugs using radiopharmaceuticals that make use of nuclides with short half-lives, and on therapeutic diagnostic drugs using PET, and we are conducting clinical trials on synthesizing devices. Furthermore, we are carrying out clinical trials of radioactive therapeutic drugs using the RI ward of Fukushima Medical University Hospital, which is the largest in Japan.

### A world first! Stable manufacturing of Astatine MABG and the start of clinical trials

The Center has succeeded in the world's first stable production with a quality that can be administered to human patients, of Astatine MABG (At-211 MABG), a candidate cancer drug that combines the alpha-emitting nuclide Astatine-211 ( $^{211}\text{At}$ ), which has the effect of killing cancer cells, with a low-molecular organic compound. At-211 MABG is expected to be able to target cancers that occur mainly in the adrenal glands and increase therapeutic efficacy, and the world's first clinical trials began in June 2022 to verify safety and efficacy.



## Translational Research Center (TR Center)



### Creating new bioindustry and jobs in disaster-stricken Fukushima!

**WATANABE Shinya, MD, PhD, Executive Director**

The center was established on November 20, 2012 to promote the "Fukushima Translational Research Project" (hereinafter referred to as "Fukushima Project"), which is one project geared toward revitalization from unprecedented damage caused by the Great East Japan Earthquake. The purpose of the Fukushima Project is twofold. The first purpose is to revitalize the pharmaceutical-related industries by providing processed specimens of biological origin, which are the products of research and development, and their analysis information, and utilizing the center's unique technology to respond to research consignments from companies. The second is to use the results of the Fukushima Project to create new bioindustry in Fukushima and expand employment.

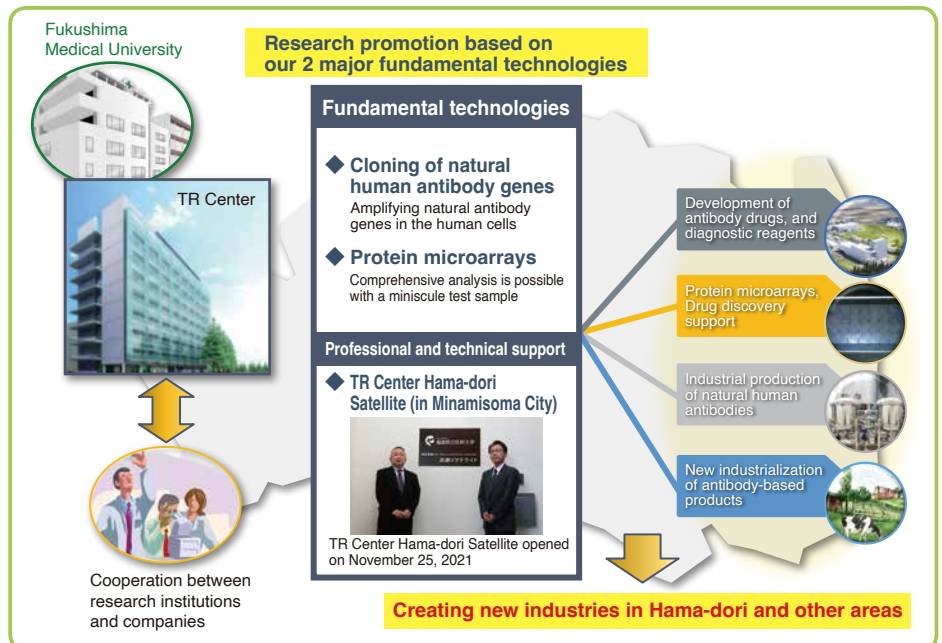
In the first phase of the Fukushima Project, which ended in FY2020, we placed focus on the needs of industry and created processed specimens of biological origin with real usage value. We have also accumulated various analysis data (comprehensive gene expression analysis data, genome analysis data, protein analysis data, drug response analysis data using cells and organisms). These results have been registered as a trademark under the brand name Fukushima Collections®. We are now making great progress providing the collaborative and Contract research, and analysis data and evaluation

models using the Fukushima Collections® alongside pharmaceutical companies and testing and diagnostic agent companies.

The second phase of the Fukushima Project started in FY2021. In order to continue supporting pharmaceutical-related industries as we have until now, we will further enhance the Fukushima Collections®. We will also promote the practical application of the natural human antibodies we obtain using the unique technology developed by the Fukushima Project. Furthermore, with the aim of achieving more sustainable revitalization, we will actively apply and develop our products and unique technologies, not only in the fields of pharmaceuticals and diagnostic agents, but also in the fields of medical supplies, food and livestock.

## Overview of the TR Center's 2nd Phase Fukushima Project

In the 2nd phase of the TR Center's Fukushima Project, we will promote research geared toward practical applications of natural human antibodies based on the two major fundamental technologies of the TR Center as an initiative in the medical-related field, which is positioned as one of the priority fields of the Fukushima Reconstruction and Revitalization Plan. In addition, the TR Center Hama-dori Satellite in Minamisoma City will play a central role in providing professional and technical support for pharmaceutical-related companies seeking to be located to the Hama-dori area. Through this initiative, we are creating new industries and expanding employment in new industries related to the production of antibodies and products that use antibodies in the Hama-dori and other areas while contributing to the revitalization of Fukushima Prefecture.



**TR Center aims to create new industries and employment in Fukushima in Hama-dori and other area by establishing the Fukushima brand in the process of supporting pharmaceutical-related industries. ⇒ For the revitalization of Fukushima**

# Health Promotion Center

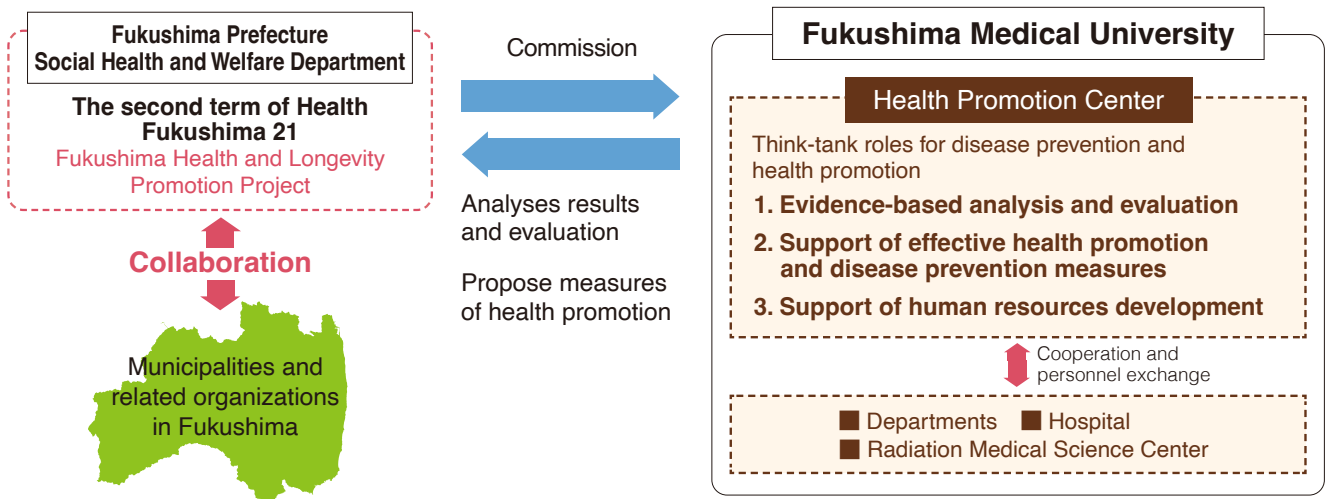


## Advancing healthy life expectancy and reducing health disparities

HOSOYA Mitsuaki, MD, PhD, Executive Director

Our center is expected to serve as a think-tank, playing the roles for preventive medicine and health promotion in line with Fukushima Prefecture's motto "Let's make the people and communities of Fukushima come alive with smiles" as advocated in its "Health Fukushima 21 (the second term)". Specifically, our activities are as follows. First, we scientifically analyze and evaluate medical expenses, health-checkups, and long-term care data stored in the FDB (Fukushima Health Database) along with registered cases of strokes and myocardial infarctions. Second, we extract issues based on the analysis and evaluation results and offer advice and support for creating effective health promotion measures in the prefecture and support for projects carried out by municipalities. Third, we hold development programs to train public health nurses and other health care workers who will take on the responsibility of health promotion activities in the prefecture as well as working closely with the prefecture to ensure the continuous retainment and training of public health physicians. We also hold events and produce video contents to enlighten our prefectural residents about the importance of maintaining one's health.

Through all these activities, we would like to prevent life threatening diseases and extend healthy life expectancy for residents.



At the Health Promotion Center, we use the FDB (Fukushima Health Database) to create annual reports on the state of medical care and examinations. We plan to continue creating such reports based on the data accumulated in the FDB. In terms of supporting the development and training of human resources, in addition to holding training sessions for specialists in social medicine, we also hold various training sessions several times a year for professionals in health-related fields working for the prefecture and municipalities. Through a health promotion event called "Iki-Iki Kenko-zukuri Forum" and online video content on health issues in Fukushima Prefecture, we are encouraging prefectural residents to improve their lifestyle and promote their health.



Training sessions for professionals in health-related fields working for the prefecture and municipalities



"Iki-Iki Kenko-zukuri Forum"



Video content



## Thyroid and Endocrine Center



**Serving as the contact point for internal medicine and surgical departments, we would like to provide patients with optimal medical care**

**SUZUKI Satoru**, MD, PhD, Executive Director

Conventionally, diagnosis and treatment of endocrine diseases have been dealt with at the internal medicine and surgical departments separately, but this Center serves as the comprehensive contact point for these departments so that patients can receive the optimal medical care. Clinical practice for endocrine diseases involves a variety of departments including the Thyroid and Endocrine Medicine, and Diabetology, Endocrinology and Metabolism Departments in internal medicine and, among surgical departments, Thyroid and Endocrine Surgery, Neurosurgery, Urology and Adrenal Endocrine Surgery, Otolaryngology - Head and Neck Surgery Departments. These departments share information by holding regular conferences and other means. We are enhancing efforts to provide patients with optimal comprehensive medical care by sharing information among specialists gathered from various departments. Commissioned by Fukushima Prefecture, we treat a large number of patients who are determined to require medical care as a result of the Fukushima Health Management Survey's Thyroid Ultrasound Examination. Clinical practice is conducted primarily by the staff at our Center using the leading-edge devices available at our Advanced Clinical Research Center.

## Advanced Clinical Division

PICU  
(Pediatric Intensive Care Unit)



### 3 Pillars of the Mirai Building

1. Medical treatment for emergencies, disasters, and nuclear exposure
2. Medical treatment giving women and children peace of mind
3. Enhanced treatment environment

#### A: Maintenance of the Children's Medical Center

- A facility that accepts patients under the age of 15 and treats them comprehensively across all departments.
- Enhancing the system of treatment for children with serious diseases.

#### B: Expansion of the Maternal and Perinatal Center

- A facility that provides advanced medical treatment for high-risk mothers, fetuses, and newborns in the (prenatal and postnatal) perinatal phase.
- Enhancing a medical environment that protects mothers and children in order to feel safe and secure giving birth to and raising children.

#### C: Strengthening our Reproductive Medicine Center

- A facility that functions as the base hospital in Fukushima Prefecture for fertility treatments.
- Providing advanced medical care related to infertility treatment and enhancing our consultation and support system.

#### 5th Floor: Children's Medical Center

- June 2017, began operating a PICU (pediatric intensive care unit) with 4 beds
- June 2018, PICU changed from 4 beds to 6 beds (increase of 2 beds)
- October 2018, changed to 51 beds per ward (decrease of 8 beds)
- November 2019, changed to 53 beds per ward (increase of 2 beds)

#### 3rd Floor: Maternal and Perinatal Center

- MFICU 6 beds
- East wing 31 beds (mainly obstetrics)
- NICU 15 beds
- GCU 12 beds

#### 2nd Floor: Reproductive Medicine Center

- April 2019, opened as a central treatment facility.
- At the request of the prefecture, established an infertility consultation center.

## Education and Human Resource Development Division

**We are fostering human resources dedicated to supporting the lifelong health of the people in Fukushima.**

In order to sustain our activities over a long period of time, this division is fostering competent human resources to continue the work of our center, and next-generation medical professionals who can contribute to community-level medical care as well as those for natural disasters and emergency radiation exposure.

#### Clinical Medicine

Radiation Health Management  
Thyroid and Endocrinology  
Disaster Psychiatry  
Radiation Oncology  
Medical Oncology  
Radiation Disaster Medicine

#### Social Medicine

Epidemiology  
Health Risk Communication

#### Basic Medical Science

Radiation Life Sciences  
Radiation Physics and Chemistry

#### Graduate School of Medicine Master's Course

#### Division of Disaster and Radiation Medical Science

As it has become clear that there is a shortage of human talent capable of dealing with the compound disasters of radiation poisoning caused by nuclear power plant accidents following earthquakes and other natural disasters, we are establishing a graduate school in collaboration with Nagasaki University to provide education on disasters, radiation exposure, and radiation.

## Medical support for Futaba area

**Securing secondary emergency medical services in the Futaba area and providing wide-area comprehensive medical support.**


Fukushima Medical University established the "Futaba Emergency and General Medicine Support Center" in April 2016. It has been working to support the "Futaba Medical Center", established by Fukushima Prefecture in April 2018 by dispatching doctors and providing remote diagnoses, etc., provide medical support (individual guidance for untreated patients, etc.) for the residents of the Futaba area, and operational support of a multi-purpose medical helicopter. In this way, it protects the health of residents who have returned to the Futaba area, nuclear plant employees, and those employees engaged in recovery projects, and supports the revitalization of the Futaba area from the medical side by resolve medical concerns and encourage returning.



Multi-purpose medical helicopter

# Fukushima Global Medical Science Center Floor Arrangement


- Radiation Medical Science Center for the Fukushima Health Management Survey
- Translational Research Center
- Thyroid and Endocrine Center
- Education & Human Resource Development Division
- Advanced Clinical Research Center
- Health Promotion Center
- Advanced Clinical Division



**Disaster Medicine/Medical Industry Bldg.**  
★8-story/1 basement structure

- Translational Research Center (TR Center)
- Education & Human Resource Development Division
- Advanced Clinical Research Center


Rooftop machinery storage space	
8F	Education & Human Resource Development Division
7F	Education & Human Resource Development Division
6F	Education & Human Resource Development Division
5F	Translational Research Center
4F	Translational Research Center
3F	Translational Research Center
2F	Translational Research Center
1F	Translational Research Center
B1	Advanced Clinical Research Center



**Environmental Dynamic Analysis Center Bldg.**  
★2-story structure

- Advanced Clinical Research Center

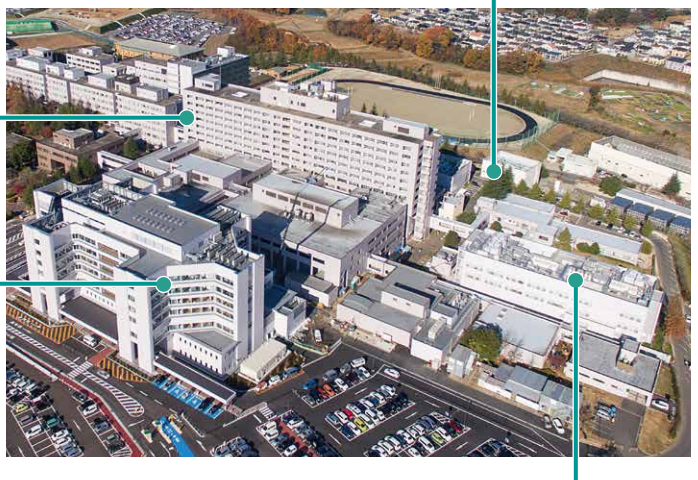
2F	Department of Environmental Dynamics Investigation
1F	Machine room, Department of Environmental Dynamics Investigation




**Medical Center for Fukushima "Life & Future" Bldg.**  
★7-story/1 basement structure

- Advanced Clinical Division
- Radiation Medical Science Center for the Fukushima Health Management Survey
- Health Promotion Center
- Thyroid and Endocrine Center

7F	Radiation Medical Science Center for the Fukushima Health Management Survey, Health Promotion Center
6F	Radiation Medical Science Center for the Fukushima Health Management Survey
5F	Children's Medical Center
4F	Female Disease Ward, RI Ward
3F	Maternal and Perinatal Center
2F	Chemotherapy Center, etc., Thyroid and Endocrine Center
1F	Disaster Medicine / Advanced Emergency and Critical Care Center
B1	Machine room



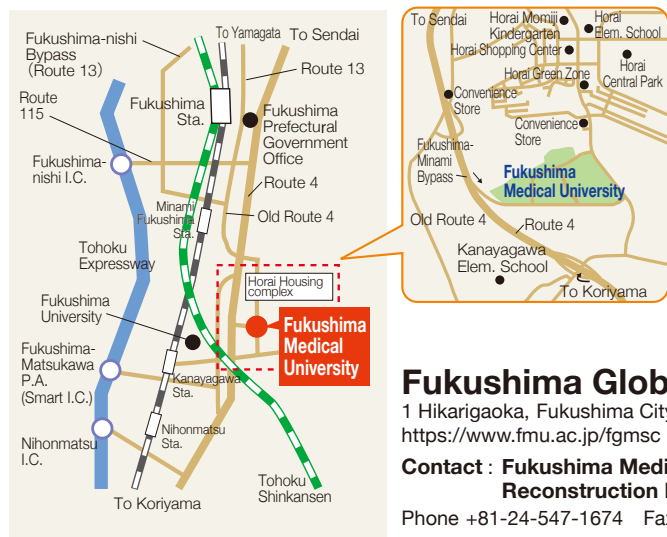


**Advanced Clinical Research Center Bldg.**  
★3-story/1 basement structure

- Advanced Clinical Research Center

3F	Office, Machine room
2F	Laboratories/Meeting rooms, etc.
1F	Diagnostic imaging (PET-MRI and PET/CT)
B1	Machine room, Cyclotron

## ACCESS



**By Car:** Approx. 13 min. after exiting the Tohoku Expressway at Fukushima-nishi I.C., or approx. 8 min. from the Fukushima-Matsukawa Smart I.C. (ETC-equipped vehicle only)

**By Bus:** Get on a bus at No. 5 or No. 6 stands in front of the JR Fukushima Sta. (East Exit), and get off at the "Idai-byoin" or "Ikadaigaku-mae" stop. Approx. 36 min. required.

## Fukushima Global Medical Science Center

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