

Medical Physics Educational Program

■ What is a Medical Physicist?

A medical physicist in Japan is a medical professional who contributes to medical care by ensuring that medical care involving radiation is properly performed. In radiotherapy, medical physicists optimize treatment plans and conduct quality control and verification of the actual medical application working with physicians, clinical radiological technologists and radiotherapy quality control specialists. Medical physicists also confirm the accuracy of the position and the amount of radiation doses administered to the patient body, ensuring that they are within the clinically required range, and that the treatment is performed as prescribed by the physicians. They also engage in medical physics research and development related to radiotherapy. For matters related to diagnosis and nuclear medicine, they work with physicians to ensure the maintenance of a clear balance between effectiveness and safety of diagnoses and conduct quality control and verification of the diagnostic apparatus and images, working with the clinical radiological technologists. They also engage in medical physics research related to diagnostic radiology.

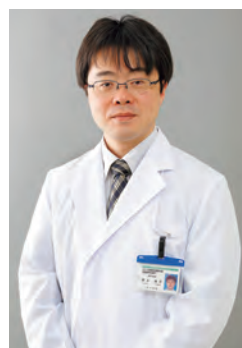
1,427 medical physicists (as of December 1, 2022) and 79 therapeutic medical physicists (as of April 1, 2022) have been certified in Japan by the Japanese Board for Medical Physicist Qualification. They are actively working in various fields including education, research, clinical settings and industry.

■ About the Program

This program has been accredited as a medical physics education course that meets lecture/clinical standards complying with the education curriculum guidelines set by the Japanese Board for Medical Physicist Qualification (JBMP). Those who have completed this course are given preferential treatment in gaining certification as a medical physicist. For example, the required number of years of experience in medical physics for those who have completed a master's degree is reduced from three to two years.

The program includes the Master's Program, the Combined Master's and Doctoral Program and the Doctoral Program. The medical physicist examination is conducted in Japanese.

For more information about the curriculum, please refer to this page (<https://www.med.hokudai.ac.jp/en/bme/medical-physicists.html>) on our website. For further information about medical physicist examinations and accreditation as a medical physicist, please refer to the website of the JBMP (<http://www.jbmp.org/english/>).



Staff of the Medical Physics Educational Program

SUZUKI Ryusuke

(Specialized in Clinical Medical Physics / Medical Physicist)

about the curriculum



website of the JBMP



Medical Device Development Program

(Master's program only)

This program aims to train scientists who will be engaged in research and development mainly on diagnostic and therapeutic equipment using radiation. With the educational curriculum designed for acquiring advanced engineering knowledge, students must learn basic subjects related to the characteristics and functions of the human body as well as subjects related to biomedical engineering such as the influence of radiation on the human body, this knowledge is necessary for research and development of medical equipment. Students also have to learn applied subjects related to designing medical equipment, and handling of medical images and information. A "Certificate of Completion of the Medical Device Development Program" will be awarded to successful students.

Please contact the academic affairs section of the graduate school (d-tanto@med.hokudai.ac.jp) for detailed information about the program.



Message from a Certified Medical Physicist

To Those Aspiring to Become Medical Physicists

I entered the doctoral program at the Graduate School of Medicine, Hokkaido University in 2016, the year before the Graduate School of Biomedical Science and Engineering was established. The curriculum of the Medical Physics Educational Program covers the content of the medical physicist certification exam, and I received ample training in clinical practice, especially quality control and assurance. I was also able to do medical physicist work related to real-time tumor-tracking and proton beam therapy, which are unique features of Hokkaido University. Such experience was not only helpful to prepare for the medical physicist certification exam, but also provided many insights for my own research.

I completed the doctoral program in 2020 and am currently working in research and development of diagnostic medical devices at a company. Although my specialty within the field of medical physics has changed from radiation therapy to diagnostic imaging, the knowledge and experience I have gained through the Medical Physics Educational Program is used in many aspects of my daily work.

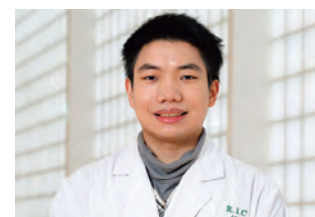


Philips Japan, Inc.
MR Clinical Scientist

Division of Medicine (Doctoral Program),
Hokkaido University Graduate School of Medicine
(graduated in March 2020)

KWON Jihun

Message from an International Student



2nd-year Master Student
Molecular Biomedical Science and Engineering Course,
Department of Integrated Molecular Imaging,

LIN Longxin
[China]

Choose world-class education and research environment, choose to be a great researcher

I am enrolled in the master's program of the Graduate School of Biomedical Science and Engineering at Hokkaido University, which its beautiful campus and world-class education and research environment. With the progress of medicine, more precise diagnosis and therapy are necessary. I am conducting research in nuclear medicine, which offers solutions to more precise medicine. This rapidly growing field combines medical imaging, molecular biology, and radiation physics to diagnose and treat diseases. Our research team has designed various kinds of nuclear pharmaceuticals that are applied to diagnosis and therapy. I will continue this pharmaceutical research to contribute to the development of nuclear medicine.

I chose this Graduate School because the curriculum not only provides a comprehensive understanding of nuclear medicine, but also multidisciplinary skills and knowledge covering medicine, physical science, and engineering.

There are also many opportunities to communicate with scientists from around the world. I can truly recommend our Graduate School as it provides a supportive and dynamic environment in which to pursue one's education and research goals.

Number of International Students

(Data as of March 1, 2023)

■ Distribution by Country/Region

Area	Country/Region	Number
Asia 4 students(67%)	China	3
	Mongolia	1
Africa 2 student (33%)	Nigeria	1
	Ghana	1
TOTAL		6

■ International Student Numbers by Graduate Program

():number of female students included

Master's Program	Doctoral Program
2 (0)	4 (0)

■ Methods of Financial Support

Japanese government	1
Self-Supported	5
TOTAL	6

Messages from the Former / Graduated Students



Sony Semiconductor Solutions Corporation

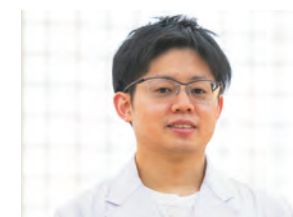
March 2020 graduate of Master's degree program

FUKUDA Shunsuke

Understanding the Joy of Manufacturing

I was interested in developing medical devices when I majored in radiation during undergraduate school, so I went on to the Graduate School of Biomedical Science and Engineering. My research theme during graduate school was the development of PET equipment that can be attached to radiotherapy equipment. In PET equipment, signal processing is performed by HW to process a large amount of radiation event information instantly, and my research activities focused on the design of signal processing circuits. I was able to work on this theme for two years and I believe this was a very valuable experience.

While I encountered numerous issues in design and development, that experience helped me expand the scope of my job search, which led to my current occupation as a circuit design engineer. In my graduate school life, I learned the joy of manufacturing and was able to expand my job search options. I think this kind of experience is one of the appeals of the Graduate School of Biomedical Science and Technology.



postdoctoral researcher,
Global Center for Biomedical Science and Engineering,
Hokkaido University

March 2022 graduate of Doctoral Program

NISHIOKA Soichiro

Attractiveness of Fusion of Different Fields

I received my master's and doctoral degrees from the Graduate School of Biomedical Science and Engineering. Here I studied the mechanisms of cancer cell resistance to radiation at the molecular level. It was fulfilling to make discoveries that lead to further discoveries. I wish to remain at the university and contribute to advances in medicine through cell biological research.

The strength of this graduate school is that experts in the diverse fields from both biological and physical sciences collaborate to solve medical problems, and opinions can also be exchanged with those engaged in both basic and applied clinical research. Professors at the Graduate School of Biomedical Science and Engineering are enthusiastic about both education and research, and support students to cultivate expertise in their field, learn to conduct research, and obtain communication skills while working hard in a favorable environment. If you are interested, please feel free to visit the laboratory and see the research content, feel the atmosphere, and get to know the personalities of the members.