

FEATURES OF THE GRADUATE SCHOOL OF BIOMEDICAL SCIENCE AND ENGINEERING

In the Graduate School of Biomedical Science and Engineering, we have established two courses to meet student interests and the needs of their future careers: The Quantum Biomedical Science and Engineering Course to acquire the in-depth comprehensive knowledge required to apply the basic radiation physics developed through quantum mechanics to medical science, and the Molecular Biomedical Science and Engineering Course to acquire the in-depth knowledge required to apply science and engineering to *in vivo* molecules in medical science. These courses are offered with unique curricula exclusive to our school.

Interdisciplinary Subjects / Course Work

- Lectures in interdisciplinary subjects for medicine, science, and engineering where students will acquire the basic knowledge and skills of these fields, in addition to a basic knowledge of medical science and medical ethics
- Productive course work for students with diverse backgrounds to complete the learning tasks systematically, ranging across multiple subject areas



Support System for International Students

- At the Graduate School of Biomedical Science and Engineering, courses are provided in English in principle if international students attend the courses. Students can complete their programs only in English.
- Special selection for international students is conducted using Skype for those who have difficulty in visiting Japan for an entrance exam. (See p.9)

Global Perspectives

- World leading intensive lectures for education in medical physics and radiation biology in cooperation with internationally renowned universities and other relevant organizations

Methods of Education and Research for Career Development

- Customized opportunities for all students to be provided with individualized research support through the collaboration of the staff of the science, engineering, and medical faculties
- Hokkaido University Hospital in-house training in subjects for medical professionals and medical engineers who will play active roles in medical settings as medical physicists
- Subject curricula designed to train technical experts able to conduct research and development of medical equipment, including the quality control aspects, through actual innovative development of medical equipment in collaboration with industry



Developing Skilled Specialists with a Broad Comprehensive Understanding

- Subjects where students can acquire comprehensive medical-related industry-academia-government relevant knowledge, where it differs from standard science, engineering, and biology. This includes the historical background to biomedical science and engineering, the importance of statistics grounded in the diversity of life, medical economics, and medical administration including the development of medical equipment



Developing Specialized Personnel with High Ethical Standards

- The subjects we offer will develop high ethical standards and provide the ethical knowledge required, including the basics of medical ethics, guidelines for clinical research and conflicts of interest, knowledge which is required for "research related to human beings" when conducting research and development of medical technology and medical equipment

Message from a Student



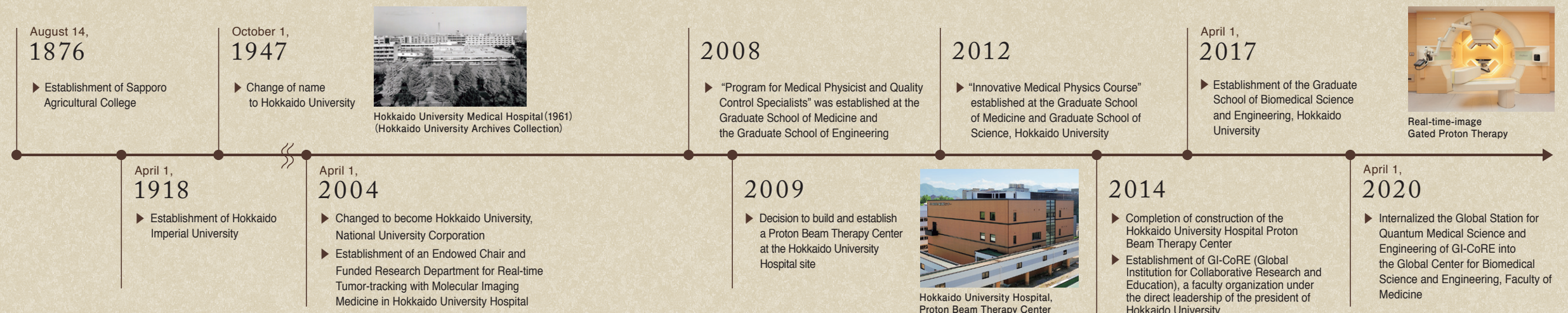
Wishing to Become a Medical Physicist

I learned about the profession of radiotherapy specialist, "medical physicist", through a lecture in my undergraduate studies. Having been interested in radiation therapy, I thought it would be the profession for me, and enrolled in the Graduate School of Biomedical Science and Engineering, which offers a medical physicist program. This program encompasses a variety of studies, included diagnostic imaging, radiation physics, and processes for developing medical devices. Studies in the program were challenging and interesting because of the difficulty and because I had opportunities to interact with students from different fields. With the support of others around me, I realized my longed-for dream and passed the examination for medical physicist. To become a medical physicist, I also need clinical experience, and I plan to gain this experience in a doctoral program. In the master's course, I proposed improvements to Auto-Planning, which automatically optimizes the radiation treatment planning, and quantitative goals for the treatment planning. With this study we can improve the quality and efficiency of treatment planning. For the future, I wish to engage in clinical work as a medical physicist to be able to perform high quality radiation treatment.

History of the Graduate School of Biomedical Science and Engineering



Sapporo Agricultural College (1876)
(Hokkaido University Archives Collection)



Real-time-image Gated Proton Therapy



Hokkaido University Hospital, Proton Beam Therapy Center