FOR IMMEDIATE RELEASE

Hokkaido University and Hitachi Complete a Facility Incorporating a Novel Proton Beam Therapy System for Cancer Treatment Developed Jointly under Japan's FIRST Program

Sapporo, March 17, 2014 --- Hokkaido University and Hitachi, Ltd. (TSE:6501) today announced that they have completed construction of facilities incorporating the “PROBEAT-RT Proton Beam Therapy System,” a novel proton beam cancer treatment system, within the Hokkaido University Hospital. Hokkaido University and Hitachi had been jointly developing the PROBEAT-RT after the project was awarded a grant in 2010 under the Funding Program for World-Leading Innovative R&D on Science and Technology (the “FIRST Program”), a national project sponsored by the Japanese government. The University plans to begin treatments using the newly constructed facilities on March 19, 2014.

The FIRST Program is a major research support structure established as part of a Japanese government initiative to promote science and technology. At a meeting of the Council for Science and Technology Policy in March 2010, out of a total of 565 applications from across Japan, 30 "Core Researchers and Projects" were awarded grants based on their notable potential in the advancement of Japanese science and technology. Hokkaido University's "Advanced Radiation Therapy Project Real-time Tumor-tracking with Molecular Imaging Technique" project was awarded a FIRST grant following an application by Professor Hiroki Shirato of the Department of Radiation Medicine, Graduate School of Medicine*. This was the only application accepted in the field of radiation therapy. The proposed system has gained worldwide attention as a potential driving force behind the advancement of radiation treatment and cancer therapy.

The goal of “Advanced Radiation Therapy Project Real-time Tumor-tracking with Molecular Imaging Technique” is to develop a treatment system that can dramatically reduce the irradiation of normal tissue, in a compact, low-cost system that demonstrates international competitiveness. This goal is achieved by combining the Real-time Tumor –tracking.

Radiation Therapy developed by Hokkaido University through X-ray therapy with Hitachi's spot scanning proton beam irradiation technology, which was delivered for the first time ever to a general hospital. In this way, Hokkaido University and Hitachi will offer a proton beam therapy system that can accurately irradiate a tumor that moves due to respiration, for example in the lung and liver.

At the recently completed facility, using the compact PROBEAT-RT Proton Beam Therapy System created through joint development activities, Hokkaido University will first provide treatment using spot scanning irradiation technology from Hitachi, while at the same time striving to quickly develop a treatment system that incorporates its own moving tumor tracking irradiation technology. Hitachi has already applied for approval for manufacture and sales of the treatment system combining spot scanning irradiation and Real-time Tumor-tracking Radiation Therapy, and hopes to receive approval and begin treatments in the first half of FY 2014.

The PROBEAT-RT Proton Beam Therapy System is a compact, low-cost proton beam cancer treatment system developed jointly by Hokkaido University and Hitachi. By merging Hitachi's technologies with the expertise that Hokkaido University has developed through radiation treatment, and by using only spot scanning irradiation as the irradiation method, it became possible to reduce the size of the gantry, the irradiation nozzle, and the accelerator. In this approach, they have created a treatment system that is easy to use and more compact overall, and which demonstrates outstanding international competitiveness. In comparison to the PROBEAT-III Proton Beam Therapy System, which was released previously by Hitachi, the circumference of the accelerator has been reduced to 18 m from the original 23 m, while the gantry, which had a maximum external length of 11 m and an internal diameter of 3.5 m, has been reduced in size to a maximum external length of 9 m and an internal diameter of 2.5 m. The installation area required for the system as a whole has been reduced by approximately 30 percent.

Hokkaido University and Hitachi will combine their respective outstanding technologies, knowledge, and experience in the medical and engineering fields, to contribute to cutting-edge radiation therapy and cancer treatments that maintain excellent quality of life (QOL) for patients through the development of this Proton Beam Therapy System.

* In parallel with development of the proton beam cancer treatment system, a component of the " Advanced Radiation Therapy Project Real-time Tumor-tracking with Molecular Imaging Technique," Kyoto University Professor Masahiro Hiraoka, who collaborated in the proposal for this national project, is developing a tracking-image X-ray therapy system that tracks and irradiates tumors, as part of his activities in the X-ray therapy field.

■Overview of Real-time Tumor tracking Radiation Therapy

In “Real-time Tumor Tracking Radiation Therapy,” gold markers are inserted in the proximity of the tumor, and a computed tomography (CT) system is used to identify the marker positions in relation to the tumor core. Using an X-ray fluoroscopy system from two directions, this technology automatically pinpoints the gold markers positions on a fluoroscopy image using pattern recognition, and repeatedly calculates the spatial position at regular intervals. The treatment beam only irradiates the targeted tumor when the gold markers are located within a few millimeters of the planned positions. As this operation is performed at high speed, it is possible to irradiate tumors with a high degree of accuracy, even when they move within the body, for example due to the patient’s respiration. Compared to conventional methods that irradiate the entire area in which the tumor might migrate, this system reduces the irradiation volume by 50-75 percent, allowing a dramatic reduction in the irradiation of normal tissue.

■Overview of Spot Scanning Irradiation Technology

Rather than scattering proton beams as in the case of conventional proton beam therapy method, Hitachi’s Spot scanning irradiation technology uses a constant, narrow beam, repeatedly turning this beam on and off at high speed as it progressively changes location. In this way, the beams can be targeted with high precision according to the shape of the tumors, even if those shapes are extremely complex, thus minimizing the impact on normal tissue.

■External view of the facility and treatment room

About Hokkaido University

Hokkaido University started out in 1876 as the Sapporo Agricultural College, the first modern academic institution in Japan. Over many generations, today we enroll approximately 18,000 students, including many international students from more than 85 countries. In order to meet the demands of society and to move ahead as a National University Corporation, Hokkaido University needs to formulate a long term goal for developing the basis of knowledge creation, knowledge dissemination and knowledge application in the new century, while re-realizing our basic philosophies and recognizing our accountability to society.

For more information on Hokkaido University, please visit university's website at http://www.oia.hokudai.ac.jp/.

About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 326,000 employees worldwide. The company's consolidated revenues for fiscal 2012 (ended March 31, 2013) totaled 9,041 billion yen ($96.1 billion). Hitachi is focusing more than ever on the Social Innovation Business, which includes infrastructure systems, information & telecommunication systems, power systems, construction machinery, high functional material & components, automotive systems and others. For more information on Hitachi, please visit the company's website at http://www.hitachi.com.

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
