On December 9, 2007, Loma Linda University Medical Center (LLUMC) held ceremonies to formally rename the LLUMC proton facility the James M. Slater, MD, Proton Treatment and Research Center, after the visionary who pioneered proton radiation therapy in a clinical setting.

In 1970, James M. Slater, MD was recruited to develop a radiation oncology program at Loma Linda University Medical Center (LLUMC). Dr. Slater graduated from Loma Linda University (LLU) School of Medicine in 1963. His major field of interest prior to medicine was physics, and during his residency he became dissatisfied about the side effects that radiation treatment often caused in cancer patients. When he arrived at LLUMC to begin a radiation oncology program, he and a few colleagues began studies of heavy-charged-particle radiation treatment for a hospital environment.

It quickly became apparent that 1970 was too early to develop a hospital-based, patient-dedicated treatment facility. A medical particle accelerator and its extensive control system had to be highly reliable, with very little "downtime," and required much greater computing power for the entire systems control system than was then available. Imaging capabilities also had to be greatly improved before building a hospital-based proton treatment system. There was little that could be done at Loma Linda to pursue development of a proton accelerator and its associated systems, but much that could be done to develop a therapy planning system that would be needed for proton therapy and also would benefit planning for photon-beam treatments.

In 1970 and 1971, Dr. Slater and his colleagues; notably Ivan Nielsen, PhD, William Chu, PhD, and Rowland Able, engineer, developed the world's first computer-assisted treatment planning system. This system employed ultrasound digital images and digitized data taken from those images, thus enabling the physician to plan treatments with information derived directly from the patient. This did much to overcome the deficiencies of focusing an invisible radiation beam on an invisible target within a patient. The new computer-assisted radiation treatment planning allowed the physician to define the patient's anatomy more precisely and to demonstrate the actual distribution of radiation in the patient. This system was improved after 1973 when computed tomography (CT) imaging became available; again, the same LLU investigators were the first in the world to undertake this advance. The technology was accepted immediately and spread throughout the world, being produced by many manufacturers and employed by many users within the subsequent decade. Today, CT-based systems are the foundation for radiation treatment planning virtually everywhere.

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Today, the James M. Slater, M.D Proton Treatment and Research Center has treated more than 18,000 patients from all over the world. The center has conducted more clinical trials on more tumor sites and published more long-term clinical outcomes than any other proton facility in the world.

Dr. Slater remains active in basic research aimed at further improving proton therapy and expanding its uses.

In the early 1980s it became apparent that CT-based treatment planning was extremely useful for x-ray treatment planning and that computer and imaging competencies were ready to support proton therapy adequately. Accordingly, Dr. Slater began to assemble a small team of scientists to develop a hospital-based system. John O. Archambeau, MD, FACR was the first faculty member Dr. Slater recruited for this purpose. Dr. Archambeau had investigated proton radiation therapy since the early 1970s, using the Brookhaven National Laboratory synchrotron.

Dr. Slater was one of the organizers of a symposium on hospital-based proton therapy systems, held at Fermilab in January 1985. This date, and event, can be regarded as salient in the history of hospital-based proton treatment, for it brought together physicists from all over the world who were interested in working toward that end. Dr. Slater and other LLU investigators participated in the symposium and its successors, which followed rapidly owing to the great interest generated by the first event. At the second Fermilab meeting, held in August 1985, Dr. Slater began making inquiries of the Laboratory's deputy Director, Philip Livdahl, as to whether Fermilab might be interested in collaborating with Loma Linda University in developing a proton synchrotron for hospital-based proton treatment. He did so because Fermilab was the most experienced accelerator builder in the world, and because he had made inquiries of private industry as to whether they would, or could, build a proton accelerator and delivery system for use in a hospital. All of the major manufacturers declined to accept the challenge.

National Laboratories do not compete with private industry, but Dr. Slater learned that Fermilab could participate under its "work for others" program, which was designed to promote technology transfer. Subsequently, Fermilab's director, Dr. Leon Lederman, the Universities Research Association, operators of Fermilab for the U.S. government, and the U.S. Department of Energy (DOE) granted the approvals required for Fermilab's participation.

In January 1986, Dr. Slater made a formal proposal to the Loma Linda University (LLU) and Loma Linda University Medical Center (LLUMC) Boards that requesting an agreement for a conceptual design be entered into with Fermilab. This was done, and in February 1986, LLU and Fermilab formally agreed to build the world's first hospital-based proton treatment system. Subsequently, the LLU team was expanded to include three engineers, Jon Slater, David Lesyna, and James Nusbaum, all of whom were positioned at Fermilab during the design and fabrication process. These Jon and David later created an engineering firm named, Optivus Proton Therapy, Inc.

Dr. Slater confirmed his early concepts that a synchrotron offered the best combination of precision, dependability, flexibility, and delivery of optimum beam characteristics for a medical machine with far less residual radiation than other types of accelerators; accordingly, the decision was made quickly to design a system based on a proton synchrotron accelerator. In February 1987, LLU and Fermilab published the engineering design report for the LLU proton synchrotron and beam transport systems, and LLU announced publicly that it would build the world's first hospital-based proton treatment facility.

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