National Biomedical Tracer Facility

DOE Approves Grant for NBTF Feasibility Study

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ON DECEMBER 10, 1990, the Department of Energy's (DOE) office of health and environmental research approved a grant application filed by The Society of Nuclear Medicine (SNM) and the American College of Nuclear Physicians (ACNP) requesting funds to support a National Biomedical Tracer Facility (NBTF) feasibility and planning study. The DOE commissioned over $83,000 for the joint study conducted by a task force consisting of members from the SNM, ACNP, DOE, and industry. The feasibility study is devised to delineate the specifications, estimated costs, and objectives of constructing and maintaining an NBTF. The task force will also make specific proposals regarding the NBTF's preliminary design, type of accelerator, energy and beam current, start-up schedule, potential operating costs, potential revenue, and siting parameters.

Chaired by Richard A. Holmes, MD, professor of medicine, radiology, and nuclear engineering, chief of nuclear medicine, University of Missouri Hospitals and Clinics, chief of nuclear medicine, Harry S. Truman Memorial Veterans Hospital, Columbia, Missouri, immediate past president of SNM, the task force is expected to tender its document to the DOE for review by mid-March 1991. The DOE will also receive recommendations developed by its office of isotope production and distribution. Based on these composite reports, DOE officials will provide testimony before the House and Senate Energy and Water Appropriations Committees later in the spring.

While Dr. Holmes is optimistic that the construction of an NBTF will eventually be approved by Congress, he does not envision an operational start-up date "until 1996 at the earliest."

According to Dr. Holmes, a major emphasis will be placed upon the proposed facility's ongoing research and education capabilities, particularly in light of the manpower shortage crisis faced by the radioscience field in the United States. Noting that the need for specialists in nuclear medicine is expected to rise 23% by the year 2000, task force member Leonard M. Mausner, PhD, director of the Brookhaven Linac Isotope Production (BLIP) facility at Brookhaven National Laboratory in Upton, New York, explains that one of the multi-purpose NBTF's functions would be "to train and teach the next generation of radiochemists and radiopharmacists."

Cost Factors

Dr. Holmes estimates that the proposed tracer facility will cost "between $30 million and $50 million" to construct. However, according to James S. Robertson, MD, PhD, director of the DOE's human health and assessments division, "that [$30 million] estimate is too low. It would probably cost three to four times that amount." Adds Gerald Goldstein, PhD, acting director of the DOE's physical and technological research division, "The budget allotted to nuclear medicine research projects is only about $35 million as it is, and right now the DOE is reluctant to request additional funding initiatives from Congress." Furthermore, when asked if the enormous bill incurred from the Persian Gulf War — which by some estimates may ultimately exceed $100 billion — would put a dent in the government's resolve to fund scientific projects, an official at the DOE remarks "that's hard to predict, but the war expenditures may very well preclude government spending on some research projects." Dr. Holmes notes that to attract Congress to the idea of building an NBTF, "we need to show them that the facility can generate revenue through sales of the radioisotopes produced there."

Despite the financial roadblocks facing the NBTF project, Dr. Mausner says, "I have to be optimistic about the chances of getting this project off the ground. I think the cost estimation of constructing a new tracer facility *is* realistic. Of course, if you were to build the NBTF from scratch, it could not be done for just $30 million. But, if you were to adapt and remodel an existing facility. . . in order to make it primarily a radioisotope-producing site, that cost estimate is not unreasonable." However, since the NBTF is expected to have a substantial research and education function, Dr. Holmes says, "It is preferable to construct a brand new facility that is

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linked to an existing academic institution. We seek to emphasize the facility's research and education function. That is crucial." William C. Eckelman, PhD, vice-president, division of diagnostic drug discoveries, Bristol-Meyers Squibb Pharmaceutical Research Institute, New Brunswick, New Jersey, concurs. "The NBTF should ideally serve both academic and commercial operations and should be located in a geographically convenient area, considering the short half-lives of many of the isotopes we wish to produce there."

Demand for Radioisotopes

Dr. Mausner says the proposed facility would ideally manufacture radiopharmaceuticals currently popular in nuclear medicine practice "as well as those research isotopes for which we expect to have clinical applications in the near future. With the anticipated growth of PET centers, the demand for strontium-82, for example, is bound to rise. Also, the further advancement of SPECT techniques should intensify the development of radiopharmaceutical compounds labeled with iodine-123, which are used in the diagnosis and management of patients with diseases of the brain and heart."

According to a preamble document developed by the task force at the SNM 1991 Mid-Winter Meeting in Tampa, Florida, the NBTF should place a high priority on providing a steady, uninterrupted supply of radionuclides currently in clinical demand, particularly germanium-68, copper-67, xenon-127, and cobalt-57. The preamble also places importance upon the further production of isotopes currently used in research, notably zinc-62, copper-64, copper-61, cadmium-109, iron-52, ruthenium-97, yttrium-88, tungsten-178, arsenic-74, selenium-72, bromine-77, and beryllium-7. Dr. Mausner says, "A major problem is that, while most of these isotopes have promising futures in the clinical arena, they are now primarily research isotopes, and most commercial pharmaceutical firms — Nordion International in Canada, for example, which has a monopoly on molybdenum-99/technetium-99m generators — are not going to manufacture them because there's no money in it, and profit is always their bottom line. It's quite a dilemma because these research isotopes represent the evolution and future of nuclear medicine."

Background

DOE advisory bodies recognized the need to establish an NBTF several years ago. An August 1989 report on nuclear medicine produced by the DOE's health and environmental research advisory committee (HERAC) strongly underscored the necessity of constructing a facility that would provide a "reliable and continuous supply of radioisotopes to support biomedical, environmental, and industrial applications in this country." The HERAC report also stated that the U.S. imports over 50% of the radionuclides used in biomedical research and predicted that this percentage would grow.

In a joint letter to the DOE's office of health and environmental research, dated August 10, 1990, SNM President Naomi P. Alazraki, MD, co-director, division of nuclear medicine, Emory University Hospital, Atlanta, Georgia, and ACNP past president Robert E. Henkin, MD, director of nuclear medicine, Loyola University, Maywood, Illinois, cited the importance and urgency of a NBTF feasibility study. "[We] endorse the effort to build a dedicated, high-energy, nuclear accelerator and rank this issue as a number one priority [for] nuclear medicine." Further, the SNM and the ACNP pointed out in written com-

(continued on page 27N)

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