Nuclear Medicine Earns $2.5 Million Increase in Research Funding Request

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In a vote that represents a major victory for the nuclear medicine community, the House Science and Technology Committee of the United States Congress authorized on April 2 a $24.2 million appropriation for the U.S. Department of Energy's (DOE) nuclear medicine applications program for fiscal year 1986—an increase of $2.5 million over fiscal year 1985.

Indicating the high priority of nuclear medicine research, it was the only DOE environmental program for which the committee requested an increase over last year's funding.

The committee requested $179.3 million ($400,000 less than last year's funding) for the entire biologic and research category, a section of the DOE environmental program.

The Reagan Administration has requested a $175.3 million budget for the biologic and research category, of which the nuclear medicine applications program is a part.

Before the nuclear medicine research appropriation becomes law, however, it must be ratified by both the House and Senate Appropriations Committees, passed in both houses of Congress, and signed by President Ronald Reagan. The Energy and Natural Resources Committee, which controls the DOE research budget in the Senate, had scheduled hearings for the end of April.

The Science and Technology Committee's action followed a March 20 hearing of the House Subcommittee on Natural Resources, Agricultural Research, and Environment to review nuclear medicine research.

Representatives of The Society of Nuclear Medicine and the American College of Nuclear Physicians (ACNP) testified at the hearing.

"Modern-day miracles"

Congressman James H. Sheuer (D-NY), chairman of the subcommittee, opened the hearing by stating: "The DOE nuclear medicine program has provided us with modern-day miracles. Nuclear medicine is opening a window to the brain, allowing actual observation of the chemical ravages inflicted by mental disease. This research conducted by the DOE provides us with hope for the future understanding of the link between mental disorders and brain function."

The Society and the ACNP noted that "the applications of basic research activities lead to extraordi-

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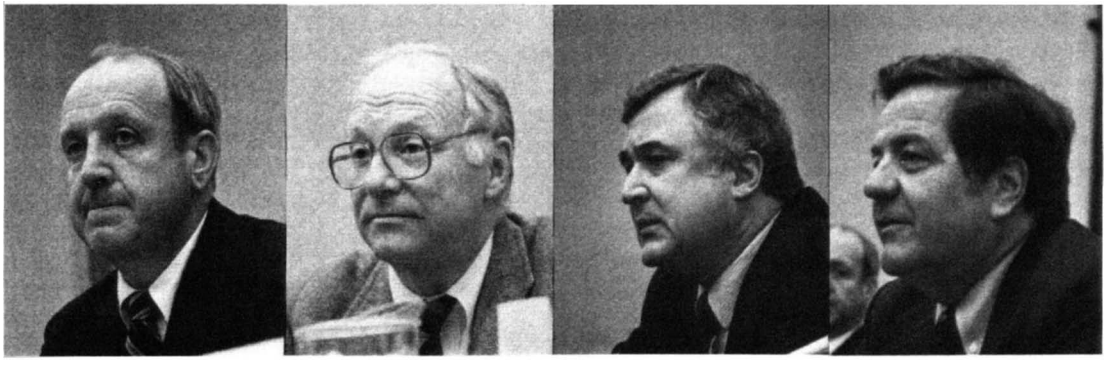

Society members giving Congressional testimony in support of nuclear medicine research, (left to right) Thomas F. Budinger, MD, Alfred P. Wolf, PhD, David E. Kuhl, MD, and Henry N. Wagner, Jr., MD.

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nary health benefits and cost savings for the American public."

The joint statement also outlined special concerns with the current program, including the inadequate budget for capital equipment needs, and the shortage of funds that allows for only two of the four banks of separators at Oak Ridge National Laboratory to operate, resulting in an inadequate supply of stable isotopes.

The overall picture of DOE support, however, has allowed the field of nuclear medicine to advance in promising directions.

Henry N. Wagner, Jr., MD, director of nuclear medicine and radiation health sciences at Johns Hopkins, credited the DOE program with developing the instrumentation that enables nuclear medicine to capture metabolic chemistry in addition to simple anatomy.

David E. Kuhl, MD, professor of radiological sciences at the University of California in Los Angeles, told the subcommittee, "Over the past several decades, the DOE's nuclear medicine program has provided benefits to the general public far out of proportion to its supporting funds. A revolution in noninvasive imaging is underway. We are entering a period of facile examination of how each part of the brain functions biochemically."

Dr. Kuhl reported the advances possible with positron emission computed tomography (PET), such as mapping cerebral glucose metabolism with fluorine-18 fluorodeoxyglucose, leading to the potential diagnosis of Alzheimer's, Parkinson's, and Huntington's diseases.

"There is hope that once the scientific basis of a physiologic imaging study is established using PET technology, similar diagnostic information might be provided by more inexpensive approaches, such as single-photon emission computed tomography (SPECT) using technetium-99m or iodine-123," he said.

Thomas F. Budinger, MD, PhD, professor of research medicine at the University of California's Lawrence Berkeley Laboratory, said that the application of nuclear medicine techniques could lead from understanding the cause, to evaluating the efficacy of various modes of therapy, and eventually to a combined therapy with heavy ion beams "in creating a model of Alzheimer's disease wherein we propose to gently eliminate small regions of the brain which we believe might be responsible for its onset."

Dr. Budinger also testified on the progress in heavy ion beam therapy for arterial-venous malformation and for localizing radiation dose in cancer patients. In addition, he said that potential therapy with monoclonal antibodies will depend on DOE research.

Alfred P. Wolf, PhD, chairman of the chemistry department at Brookhaven National Laboratory, told the subcommittee that in addition to the studies of fatty acid oxidation in the heart, and glucose oxidation in the brain, PET can also be used to study the brain's protein synthesis with labeled amino acids—carbon-11 methionine and carbon-11 leucine.

In addition, brain tumors can be studied with carbon-11 putrescine, a naturally occurring polyamine involved in rapid tissue proliferation such as neoplastic growth.

Cyclotron-PET centers

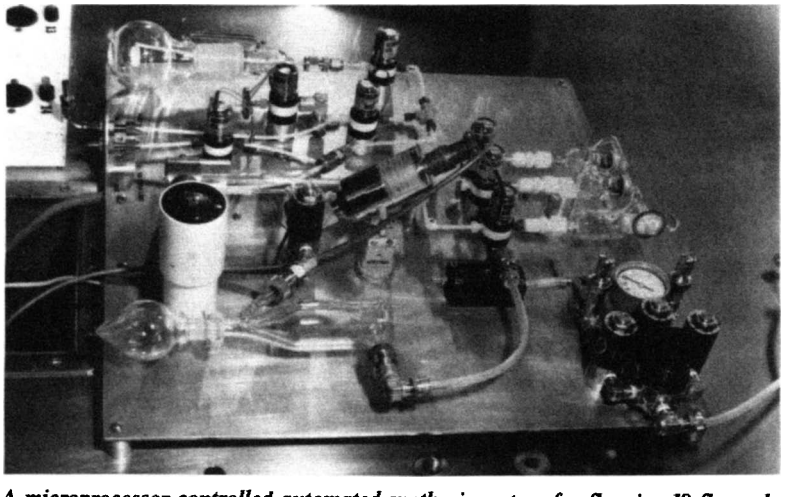
In 1976, only four centers in the world had laboratories with cyclotrons and PET units dedicated to the development of positron emitter labeled radiotracers, said Dr. Wolf. By 1988, another 20 institutions will have these facilities, he added.

The optimal transfer of PET technology, however, will depend on improved access to medical cyclotrons and PET units. Dr. Wolf said that two solutions are evolving.

One solution may result from the development of computer-controlled cyclotrons which are completely automated and can be operated by technicians.

The second answer may lie in the development of regional cyclotron-PET centers to provide short-lived radionuclides to area hospitals and services for referred patients.

"The tools and methodologies that have evolved from the DOE programs will most likely be the implements through which the very processes of many diseases can finally be conquered. The knowledge gained with the use of these tracers can even lead to the therapeutic applications of radionuclides," said Dr. Wolf. ■



A microprocessor-controlled automated synthesis system for fluorine-18 fluorodeoxyglucose. **(Courtesy of Brookhaven National Laboratory)**