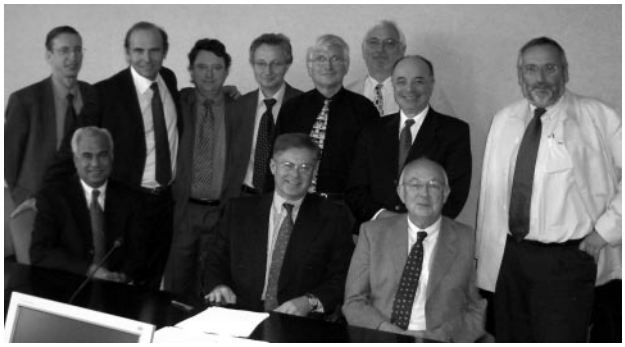
French High-Energy Cyclotron Committee Meets

The government of France and the political authorities of the Région des Pays de la Loire have initiated plans for a high-energy cyclotron to be located in Nantes and dedicated to nuclear medicine, radiochemistry, and education. The main purpose of this equipment will be to produce innovative electron-, positron-, and α-emitting radionuclides for diagnostic and therapeutic applications developed in research laboratories and hospital-based nuclear medicine departments and to advance knowledge about radiation and matter interactions.

An international scientific committee met in Nantes on September 30 and October 1, 2004. The committee was chaired by Dr. F. Corstens, current president of the European Association of Nuclear Medicine (EANM). Other members included 3 nuclear medicine specialists: Dr. G. Paganelli (Milan, Italy; representing the EANM), Dr. S. Srivastava (Upton, NY; Brookhaven National Laboratory), and Dr. D. Guilloteau (Tours, France; representing INSERM); 1 biophysicist: Dr. P. Cozzone (representing the Centre National de la Recherche Scientifique [CNRS]); 1 radiation oncologist: Dr. P. Van Houtte (Brussels, Belgium); and 4 nuclear physicists: Dr. R. Guillaumont (French Academy of Science, acting as vice-chair), Dr. B. Frois (French Ministry of Research), Dr. P. Debu, and Dr. H. Flocard (Commissariat à l'Energie Atomique).

The scientific committee is expected to critically review cyclotron operations and projects. Annual meetings will be called to review cyclotron activities and achievements, as well as planned operations and future projects. This year, the scientific committee has reviewed the general features proposed for the cyclotron and its major goals. The committee has made several proposals on the organization of the project and suggested asking potential users from throughout Europe to describe their needs and expectations for radionuclides for biological and medical research and also requesting that the facility be open to scientists working outside the Nantes area. A questionnaire, prepared by the Scientific Committee, will be circulated to members of the EANM soon. This is only one step in ensuring that the future cyclotron meets the demands of a large community of radiobiology and nuclear medicine scientists. The projected use of the facility for radiochemistry and training has also been reviewed, and the coherence of the entire project, which brings together scientists from medicine and physics, has been approved.

The cyclotron will be designed primarily to produce radionuclides, including those requiring high-energy protons (70 MeV) or α-particles. Those radionuclides that can be used for internal radiotherapy—and especially radioimmunotherapy—such as ^{67}Cu, ^{211}At, or ^{225}Ac (a parent radionuclide of ^{213}Bi), as well as positron-emitting radionuclides that are chemical surrogates of therapeutic radionuclides, such as ^{64}Cu, ^{86}Y, ^{124}I, $^{171/172}$Lu, $^{205/206}$Bi, are on the primary list of priorities. ^{52}Fe and other radionuclides of interest in diagnostics that cannot be produced by low-energy cyclotrons will also be considered, as well as innovative radionuclides for PET imaging. The scientific committee will be instrumental in further refining priorities for the cyclotron, including input from responses to the questionnaire and from the capabilities of the instrument.



Members of the scientific committee. Standing, from the left: Pascal Debu, Giovanni Paganelli, Paul Van Houtte, Denis Guilloteau, Jean-François Chatal, Jacques Barbet, Bernard Frois, and Jacques Martino. Sitting: Suresh Srivastava, Frans Corstens, and Robert Guillaumont.

The cyclotron will also offer an α-beam for radiochemistry and radiolysis studies. In particular, the study of the effect of α-particles on water-containing media, a pivotal factor in the interaction between ionizing radiations and aqueous solutions such as biologic media, represents a specific line of research, because current basic knowledge on α-particle radiolysis is quite limited.

A consortium of manufacturers has confirmed willingness to use the cyclotron facility for industrial productions on a long-term contract basis. These companies will also contribute their expertise in the production of radiopharmaceuticals as well as experience with logistics for the handling and distribution of radionuclides in Europe.

At this point, the project involves mainly the construction of a cyclotron and accompanying facilities, including a radiochemistry laboratory for the production and purification of radionuclides; a laboratory devoted to the production of radiopharmaceuticals for clinical research; and a physics laboratory focused on the α-beam for radiochemistry and radiolysis studies. This type of facility, which is still fairly uncommon, will complement

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