PRODUCTION OF INNOVATIVE RADIONUCLIDES AT ARRONAX

F. Haddad, M. Chérel, M. Bardiès, S. Auduc, R. Devilder, Y. Thomas, J.F. Chatal, J. Barbet, J. Martino

Subatech – GIP ARRONAX - Université de Nantes
haddad@subatech.in2p3.fr

ARRONAX, acronym for "Accelerator for Research in Radiochemistry and Oncology at Nantes Atlantique", is a high energy and high intensity cyclotron. It will turn into operation in September 2009 in Nantes (France). It is mainly devoted to the production of radionuclides for medicine.

A priority list based on the capability of the machine as well as on the need expressed by the European medical community through a questionnaire has been set. It contains isotopes for imaging (^{82}Sr/^{82}Rb and ^{68}Ge/^{68}Ga generators and ^{64}Cu, ^{44}Sc, ^{55}Co) and for therapeutic use (^{67}Cu, ^{47}Sc and ^{211}At). In this list, a special attention has been paid to dosimetry, both by giving lower scores of interest to radionuclides with undesirable emissions, such as high energy gammas, and by promoting β+/β- couples of radionuclides (^{64}Cu/^{67}Cu and ^{44}Sc et ^{47}Sc). Indeed, pre-therapeutic dosimetry is essential in the development of new radiolabeled therapeutics and PET imaging should prove more precise and accurate in calculating radiation doses received by critical organs and tumors.

Arronax and its partners will also devote a large effort to develop targeted alpha-radionuclide therapy. In particular, a radioimmunotherapy project using ^{211}At coupled to a specific monoclonal antibody will start this autumn to treat prostate cancer patients with high risk of relapse. ARRONAX is an important part of the project since it will have to produce astatine in large amounts on a regular basis.