TESLA Accelerator Installation: An example of generation of knowledge and innovations for health care

N. Nešković[1] and J. J. Čomor[2]

[1]Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia

[2]ELEX, Belgrade, Serbia

Abstract

TESLA Accelerator Installation, in the Vinča Institute of Nuclear Sciences, is a facility for use of ion beams in science and medicine. It has three parts – the low, medium and high energy parts. The low energy part of TESLA, which is called FAMA, is a user facility for research in the field of modification and analysis of materials with ion beams. It consists of a heavy ion source, a light ion source, a proton cyclotron, and six experimental channels. The cyclotron will be able to deliver proton beams of the energies between 1 and 3 MeV. One of the experimental channels of FAMA will be used for development of a new type of linear accelerator. The medium energy part of TESLA, which is called the H4 Facility, will be used for industrial production of cyclotron radiopharmaceuticals, primarily for positron emission tomography (PET). Its main part is a cyclotron giving 18 MeV proton beams. PET is a supreme diagnostic technique applied mostly in oncology. This production program was the basis for establishing a program of development of radiopharmaceuticals technologies. It is focused on stations for production of radionuclides and modules for synthesis of radiopharmaceuticals, primarily for PET. The program was initiated by the Vinča Institute and continued successfuly by ELEX. The high energy part of TESLA consist of the VINCY Cyclotron, which will be able to deliver 35-70 MeV proton beams, and four experimental channels. Its programs of use will include experimental production of radiopharmaceuticals, research in radiation biology and materials science, and routine proton therapy of eye tumors.