

## CERN-MEDICIS: a unique facility for the production of non-conventional radionuclides for medical research

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The MEDICIS facility is a unique facility located at CERN dedicated to the production of non-conventional radionuclides for research and development in medical imaging, diagnostics and radiation therapy. Located in a laboratory equipped to safely handle unsealed radioactive samples, it comprises a dedicated isotope separator beam line, a target irradiation station at the 1.4 GeV Proton Synchrotron Booster (PSB), or alternatively receives activated targets from external institutes e.g. during CERN Long Shut-Downs. The target is heated up at high temperatures to allow for the diffusion and effusion of the produced atoms out of the target that are subsequently ionized. The ions are accelerated and sent through an off-line mass separator. The radionuclide of interest is mass-separated and implanted into a thin metallic collection foil. After collection, followed by a radiochemistry process when necessary, the batch is prepared to be dispatched to a research center for further processing and usage. Since its commissioning in December 2017, the facility has provided novel radionuclides including, but not limited to, Ba-128/Cs-128, Tb-149, Sm-153, Tb-155, Tm-165/Er-165, Er-169, Yb-175 and Ac-225 with high specific activity values, some for the first time, to research institutes part of the collaboration. CERN-MEDICIS' research and development around the topics of production, extraction and mass-separation is in constant evolution. The facility also contributes in the education and training of young researchers. Moreover, MEDICIS is one of the pillars of PRISMAP, a network of world-leading European facilities including nuclear reactors, medium- and high-energy accelerators, radiochemical laboratories and biomedical facilities. PRISMAP acts as a European platform for medical radionuclides and supports the ongoing research on nuclear therapy and molecular imaging by providing immediate access to novel radionuclides. This presentation will provide a general overview of the facility and its operation as well as address recent achievements and developments together with the challenges that such a facility faces.

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