

## **50 YEARS OF ISOTOPE PRODUCTION VIA HIGH ENERGY ACCELERATORS AT BROOKHAVEN NATIONAL LABORATORY**

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In February 1972 the Brookhaven Linac Isotope Producer (BLIP) came online to accept protons from the 200 MeV Linac that synergistically supports multiple programs including the isotope production program, the Nasa Space Radiation Laboratory (RHIC) as well as the Relativistic Hadron Ion Collider (RHIC). In addition to the BLIP the isotope program operates the Radionuclide Research and Production Laboratory (RRPL) which contains laboratories and hot cells for processing targets irradiated at the BLIP for external customers as well as internal research. New hot cells have been brought online to aid in the processing of Ac-225. The BLIP allows the production of isotopes from 200 MeV and down in energies using stacked target arrays that allows for multiple isotope production. High energy accelerators play a critical role in supplying radionuclides such as Sr-82 used in Sr-82/Rb-82 generators for cardiac imaging. They continue to be upgraded to further production yields by installing beam rastering systems that have allowed higher intensities and thus higher production yields. Demand for isotopes that can be produced by these systems have also increased. Linear accelerators such as the one at Brookhaven National Laboratory when operating at maximum proton energy of 200 MeV can have simultaneous production of several medically relevant isotopes. Among those are Ac-225 ( $T_{1/2}=10.0$  d), Cu-67 ( $T_{1/2}=64.83$  h), Se-72/As-72 ( $T_{1/2}=26$  h), Sr-82/Rb-82 ( $T_{1/2}=1.26$  min) and Ti-44/Sc-44 ( $T_{1/2}=3.97$  h). Discussion of recent facility enhancements and future upgrades and production of novel radionuclides will be presented.