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Towards optimized production of Sc-43 at the Bern Medical Cyclotron Laboratory

Research in radioisotope production is carried on at the cyclotron laboratory at the Bern University Hospital (Inselspital). The laboratory is equipped with an IBA 18 MeV medical cyclotron, 4 liquid targets for routine F-18 production, a compact solid target station with pneumatic transport system to the hot cells, and a 6 m long research Beam Transport Line (BTL) bringing the beam to a second bunker with independent access.

The production of Sc-43 and Sc-44 is investigated. Sc-43, together with the beta- emitter Sc-47, represents an ideal theranostic pair.

Production cross-sections were measured by means of the BTL and a dedicated apparatus designed and constructed by our group. Beams were controlled on-line by UniBEaM detectors, profilers based on doped silica fibers passing through the beam, developed by AEC-LHEP and industrialized by D-PACE (Canada).

Test productions were performed with the solid target station using a novel magnetic coin target allowing the irradiation of powders compressed in pellets.

Developments are on-going aimed at a novel irradiation system composed of a compact 50 cm long beam-line equipped with active beam monitoring to focus and keep the beam on a 6 mm diameter target.

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