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119Sb: promising radionuclide for Targeted Auger Therapy - Production radiochemical separation and chelation aspects.

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Introduction: ^{119}Sb is one of the most potent radionuclides for Targeted Auger Therapy due to convenient energy and numbers of Auger electrons as well absence of any other accompanying emissions [1-3]. Antimony-119 has a half-life of 38.5 hours which is well suited for radiotherapeutic application. In the present work: production, radiochemical separation and chelation preference of antimony radioisotopes were studied.

Production of antimony isotopes was performed by proton irradiation of a natural tin target with energies of 13 and 16 MeV as well as by neutron bombardment of natural tin and antimony. Radiotracers were used for establishing radiochemical procedures for isolating of bulk mass of tin from produced no-carrier-added antimony isotopes

Radiochemical separation: Dissolution procedure for irradiated tin target was established by using hydrochloric acid and hydrogen peroxide. Further liquid-liquid extraction with ethers or ketones was applied for separation of antimony from bulk tin mass. Methods based on solid phase extraction chromatography and ion exchange chromatography in various media were tested as well.

Chelation: Several common chelation systems along with some of the novel candidates from -pa family were tested to identify chelation preference of antimony radioisotopes.

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Primary authors: Dr RADCHENKO, Valery (Life Sciences Division, TRIUMF); Mr KOSTELNIK, Thomas (Medicinal Inorganic Chemistry Group, Department of Chemistry, University of British Columbia); Ms MARIANOVA, Atanaska (DLNP, Joint Institute for Nuclear Research); Mrs KURAKINA, Elena (DLNP, Joint Institute for Nuclear Research); Mrs BAIMUKHANOVA, Ayagoz (DLNP, Joint Institute for Nuclear Research/4Institute of Nuclear Physics); Dr ENGLE, Jonathan (5Department of Medical Physics, University of Wisconsin, Madison); Mrs OLSON, Aeli (Department of Medical Physics, University of Wisconsin, Madison); Dr ELISON, Paul (Department of Medical Physics, University of Wisconsin, Madison); Dr BARHCHART, Todd (5Department of Medical Physics, University of Wisconsin, Madison); Dr HOEHR, Cornelia (Life Sciences Division, TRIUMF); Dr PREVOST, David (Life Sciences Division, TRIUMF); Dr GRAHAM, Linda (Life Sciences Division, TRIUMF); Dr VARAH, Samuel (Life Sciences Division, TRIUMF); Mrs MYNERCIH, Jenasee (Life Sciences Division, TRIUMF); Prof. ORVIG, Chris (Medic-

inal Inorganic Chemistry Group, Department of Chemistry, University of British Columbia); Dr SCHAFFER, Paul (Life Sciences Division, TRIUMF); Dr FILOSOFOV, Dmitry (DLNP, Joint Institute for Nuclear Research)

Presenter: Dr RADCHENKO, Valery (Life Sciences Division, TRIUMF)

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