THE SECURE PROJECT, A CONTRIBUTION TO A STABLE SUPPLY OF MEDICAL RADIOISOTOPES IN EUROPE

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The project “Strengthening the European Chain of sUpply for next generation medical RadionuclidEs” (SECURE) is the EURATOM-funded Research and Innovation Action (October 2022 - September 2025) under the HORIZON-EURATOM-2021-NRT-01-10. This project contributes to the sustainability of medical isotope production and its safe application in Europe nad is is focusing on promising developments in the design of irradiation targets, and production routes for existing and new isotopes in nuclear therapy and diagnostics. Isotopes critical to the success of nuclear medicine are selected and research activities are identified to address some of the major challenges in securing its future availability, with the objectives:

1. to remove critical barriers along the production of its selected alpha and beta-emitting isotopes that restrict sustainable production,
2. to develop a framework of guidance and recommendations that enable exploring the full clinical potential of alpha and beta particle therapy and its safe application,
3. to provide important lessons learned that act as a demonstration case for addressing issues in upscaling and sustained isotope production.

The expected demand for nuclear medicine for novel alpha-emitters and beta-emitters requires a re-evaluation of their production methods and inventories of target materials and parent radionuclides. A key focus of SECURE is to develop robust and scalable production methods for crucial radionuclides used in nuclear medicine, encompassing both diagnostic and therapeutic applications. The project is dedicated to exploring traditional reactor-based routes as well as innovative accelerator-based methods. This includes identifying and evaluating production techniques for alpha emitters like Ac-225 and Pb-212 as well as beta-emitters such as Lu-177, Tb-161, Au-199, and Ag-111, to create a sustainable production chain. The SECURE consortium efficiently uses the current resources for new radionuclides, in particular for alpha-emitters and the relevant beta-emitting theranostic radionuclides for improved patient treatment within the multidisciplinary team.

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