ID de Contribution: **31** Type: **Non spécifié**

# Projet BePAT : BeaQuant, un autoradiographe numérique au service de la production de radionucléides pour des applications en médecine nucléaire

*mardi 15 mars 2022 11:00 (20 minutes)*

One of the main difficulties in the development of radionuclides in nuclear medicine is related to the optimization of their production. As these are, in most cases, produced using a nuclear reactor or a particle accelerator, it is important to define optimal production methods in order to obtain a final product with the highest possible isotopic and chemical purity. In addition to production and distribution challenges, incomplete identification and spectroscopic characterization can sometimes be a limiting factor in determining the full potential of a radionuclide. This is particularly the case for heavy Auger radionuclides (Z>40) where the number of Auger electrons emitted remains a theoretical value [1].

The BePAT project aims to demonstrate that it is possible to overcome these limitations by using a digital autoradiograph. Thus, through the exploratory study of the theragnostic β+/Auger couple, iridium, 187 and 189, we want to show that it is possible to identify and distinguish contaminants efficiently. Indeed, the production of these radionuclide with an alpha beam and a natural rhenium foil is inevitably accompanied by the production of contaminants that are difficult to separate chemically, such as iridium, 188 and 190.
In parallel, part of the project will focus on the possibility of performing localized α-spectrometry of irradiated targets. While waiting to be able to acquire elements heavier than bismuth again, the project will also focus on astatine-211, the production of which is well-mastered at the GIP ARRONAX site located in Saint-Herblain.

[1] D. Filosofov, E. Kurakina, et V. Radchenko, « Potent candidates for Targeted Auger Therapy: Production and radiochemical considerations », Nucl. Med. Biol., vol. 94-95, p. 1-19, mars 2021, doi: 10.1016/j.nucmedbio.2020.12.001.

Funding: Plan de relance - ANR-21-PRRD-0027-01

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**Classification de Session:** Radionucléides / Ligands

**Classification de thématique:** Radionucléides / Ligands