3-year Ph-D proposal

Title: « Development of radiotracers for targeted radionuclide therapy of melanoma »

PhD start date: January 2024

Keywords: Organic chemistry, medicinal chemistry, radiochemistry, melanoma, targeted radionuclide therapy

Summary of research project:

Despite recent advances in immunotherapy treatments, metastatic melanoma remains associated with poor prognosis. We previously reported the development of a small molecule, called ICF01012 and targeting melanin pigments, that has been radiolabelled with iodine-131 and evaluated for targeted radionuclide therapy (TRT) of pigmented melanoma in several preclinical models. The significant antitumour effects observed with this [^{131}I]ICF01012 treatment prompted us to start an ongoing phase I clinical study (NCT03784625). However, the regulatory constraints for the radiosynthesis and handling of such iodine radionuclides and associated radiotracers as well as the clinical management of patients receiving high dose of [^{131}I]ICF01012 encourage us to further investigate a second generation of melanin-targeted ligands radiolabelled with less restrictive metallic radionuclides for TRT (e.g. copper-67, lutetium-177 and et terbium-161 (β^--emitters) or actinium-225 (α-emitter)). The recruited PhD student will be in charge of the synthesis and characterization of ICF01012 analogues conjugated with polyazamacrocycles for metal radionuclide chelation. He/she will optimize the radiolabelling procedures and will participate to the preclinical evaluation of the radiotracers including stability and selectivity studies, cellular uptake, biodistribution and antitumour efficacy experiments in relevant mice models. This research project, part of the SIRIC LYriCAN+ program, will take benefit from the complementary and multidisciplinary expertise in radiopharmaceutical development of the IMoST (Clermont-Fd) and LAGEPP (Lyon) laboratories.

Required profile:

We are looking for a highly motivated candidate having the desire to work on a multidisciplinary research topic at the interface of organic chemistry/radiochemistry and biology. The candidate must have a master degree (or equivalent) in chemistry. A solid knowledge in organic chemistry (experimental and theorical) and in classical purification and analysis procedures (HPLC, flash chromatography, NMR, mass spectroscopy, …) is mandatory. Experience in radiochemistry will also be an asset. A good level (written/spoken) of English will be essential. In addition, a mobility between Clermont-Fd and Lyon research sites is asked.

Application procedure: Candidate should provide a CV, letter of motivation, a support letter from the master supervisor and transcripts of Master 1 and 2 degrees by e-mail at the following email address:

Dr Aurélie Maisonial-Besset : aurelie.maisonial@uca.fr

Application deadline: November 31th 2023

Funding: French National Cancer institute (INCA), SIRIC LYriCAN+ program

PhD supervisor and host laboratory:

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