Post doctoral position in BIOLOGY/IN VIVO IMAGING

Development of new radiotracers for PET imaging of mutated isocitrate dehydrogenases enzymes (mIDH) in solid tumors.

Laboratory: UMR 1240 INSERM UCA, IMoST (Molecular Imaging and Theranostic Strategies), Clermont Auvergne University
Supervisors: Drs Leslie MAZUEL and Aurélie MAISONNIAL-BESSET
Funding acquired: 1-year Post-Doctoral Contract from January 2025 (PRCI ANR/DFG)

Keywords: SPECT/PET imaging, cancer, cell culture, preclinical animal model, mIDH1, biochemistry.

Context and description of the project: Isocitrate dehydrogenases (IDH) are enzymes that catalyse oxidative decarboxylation of isocitrate to α-ketoglutarate with subsequent reduction of NADP co-factor to NADPH. IDH are involved in several biological processes such as cellular metabolism, cellular defense against oxidative stress, oxidative respiration, and oxygen-sensing signal transduction. However, mutated IDH enzymes (mIDH) have been observed in several cancers including glioma, acute myeloid leukemia (AML), intrahepatic cholangiocarcinoma, and chondrosarcoma. Mutated IDHs confer neomorphic activity, converting α-ketoglutarate to the oncometabolite D-2-hydroxyglutarate, involved in tumorigenesis. High cellular levels of 2-HG can inhibit, for example, enzymes implicated in DNA-demethylation, histone-demethylation, and subsequently impair normal cellular differentiation and promote tumor development. Targeting mIDHs has emerged as a promising therapeutic strategy and three mIDH inhibitors (vorasidenib, enasidenib, olutasidenib have been approved by FDA and/or EMA in various protocols of therapy (glioma, AML, …). Accurate evaluation of mIDH status is essential for effective patient management. Currently, the presence of mIDH1 is determined either by invasive biopsy or indirectly by measuring the mIDH-derived 2-HG using magnetic resonance spectroscopy. Non-invasive imaging techniques for the detection of the mIDH1 protein using positron emission tomography (PET) or single-photon emission computed tomography (SPECT) could be of valuable help to provide information on the mutational status of patients' tumours, to select admissible patients for anti-mIDH therapies and to determine efficacy of therapeutic inhibitors in order to facilitate precise medicine.

This international project will be performed in close collaboration with the neuroradiopharmacy laboratory of the HZDR (Rresearch site Leipzig, Germany, Drs W. Deuther-Conrad and B. Wenzel).

Objectives: In this context, the aim of this post-doc position will be the biological evaluation innovative radiotracers developed by our team, targeting mIDH, for PET and SPECT imaging. In this research project, the candidate would be in charge of i) the in vitro evaluation of new radioiodinated and radiofluorinated mIDH ligands on cultured tumoral cells expressing mIDH, ii) the characterisation of preclinical animal model of solid tumors such as chondrosarcoma or glioma, and ii) the in vivo biodistribution studies by SPECT or PET imaging and ex vivo gamma-counting of the most promising radiotracers.

Candidate's profile: Applicants should have a Ph.D. degree or equivalent in biology or biomedical sciences.
Candidates are expected to have:

- Strong background and PhD training either in cancer biology, molecular biology, or biochemistry.
- Experience in common biological assays, including cell culturing, Western Blotting, immunohistochemistry and statistical analyses.
- Knowledge of handling radioactive material
- Experience with in vitro characterisation of radiotracers (uptake, competition assay)
- Experience with tumor imaging or preclinical disease models for molecular imaging procedures.
- To be willing to work with animals (mice handling, intravenous injection, tissue processing).
- Strong commitment to experimental bench research is expected.

- Naturally collaborative and self-motivated style is necessary to work effectively in a multidisciplinary and integrated team
- Excellent communication and writing skills in English and/or French language.

The research unit IMoST (UMR 1240, INSERM, UCA) of Clermont-Ferrand, attached to ITMO « Technologies pour la Santé » and to the cancéropôle CLARA, aims at identifying new tools and/or targets for the treatment, the therapeutic follow-up and their transfer to clinical trials, essentially in the field of oncology. Relying on a strong expertise in radiolabeling and biomarker studies for treatment response and/or resistance, this unit is organized around two teams working on interconnected projects focused on 3 axis, melanoma, cartilage and triple negative breast cancer (TNBC). In fine, the two teams will converge to personalized treatment approaches combining the identification and the highlight of biomarkers (imaging, biopathology) with associated therapies (vectorized therapies and internal radiotherapies). This approach is reinforced by the presence in the unit of a technical platform including locals and equipments dedicated to chemistry, radiochemistry, genomic/post-genomic (transcriptome, proteome, metabolome,…), experimental pharmacology and small animal in vivo imaging (SPECT, PET, optical imaging and X-ray). Our research works, as well as transfer to clinical trials, also benefit from the expertise of radiopharmacists, anatomopathologists, clinicians and oncologists of the Regional Center of Cancer Jean Perrin and the University Hospital Center Gabriel Montpied.

Application: Send a file including detailed curriculum vitae, a cover letter describing your interest, background, and qualifications, and a list of three references (including contact information) to leslie.mazuel@uca.fr.
Dead line: 30th November 2025.