

TRIO₂ (Translational Research In Oncodermatology and Orphan skin diseases)
INSERM U1312 - BRIC

Postdoctoral position in cancer metabolism at the Bordeaux Institute of Oncology

36 months Post-Doc offer at Bordeaux/France

Field: Cancer, Skin, metabolism

Contract: Three years

Localization: Bordeaux University, France

Laboratory: TRIO2 INSERM team (<https://www.bricbordeaux.com/en/bric-team/recherche-translacionnelle-en-cancerologie-cutanee-et-maladies-cutanees-rares/>)

This team work on oncodermatology in tight collaboration with dermatology department at the Bordeaux University Hospital.

Project description:

Growing evidence indicates that energy metabolism reprogramming plays an important role in the initiation and progression of many types of human tumors. However, little attention has been given to the precise deciphering of metabolism rewiring and its molecular inter-patients and intra-tumor heterogeneity in skin cancers. Our consortium has recently found that specific metabolic modifications precede cutaneous squamous cell carcinoma (cSCC). Our data indicate that 1) pyrimidine biosynthesis pathway is upregulated throughout UVB-induced tumorigenesis, 2) activation of dihydroorotate dehydrogenase (DHODH) fuels mitochondrial respiration to coordinate persistent nucleotide biosynthesis and ATP generation, and 3) blocking oxidative phosphorylation requires a prior bioenergetic stratification of tumors using several markers.

Having a biobank of cSCC samples at different stages of carcinogenesis, several multi-omics approaches will be used in this funded project for capturing the intra-tumoral heterogeneity among precancerous and cSCC lesions. The combined multi-omics approaches provides a reliable method to explore mechanisms involving in the evolution of precancerous lesions to malignant cSCC and can lead to discovery of new targets for cancer therapy.

Recent publications of the team:

Moisan et al. PNAS, PMID: 33558238 ; Hosseini et al, Oncogenesis, PMID: 31551419;
Mahfouf et al. J Invest Dermatol, PMID: 30878676, Hosseini et al, Cell Rep, PMID: 29925003.

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Knowledge / skills:

- Multi-omics approaches including Single-cell RNA sequencing (scRNAseq) by GeoMX Digital Spatial Profiler, spatial transcriptomic and proteomic analyses on human cSCC samples at different stages of carcinogenesis.
- Besides in vitro models, well-defined immunocompetent SKH-1 mouse multistep photocarcinogenesis model and xenograft of human cell lines (CLX) into immune-deficient mice will be used in this project.
- The main used biochemistry techniques are measuring the oxygen consumption rate (by seahorse), the activities of mitochondrial complexes and ROS levels as well as metabolomics.

Interested applicants should have a PhD degree in Biology or Biochemistry field as well as a background in molecular cell biology techniques. Ideally, these will include experience with mouse models, mammalian cell culture and above mentioned techniques.

Additional comments

The team has access to many technological platforms to perform this project: an Experimental pathology platform for sectioning and histological analysis of the tissues (Cryostat and paraffin), a Flow Cytometry Platform, a microscopy Platform, proteomic platform, and an animal facility.

How to apply:

Interested applicants should provide a *curriculum vitae*, a cover letter including a brief description of prior research experience and 2 supporting letters, to Hamid-Reza REZVANI (hamid-reza.rezvani@u-bordeaux.fr).