



Postdoctoral researcher position at ICM Montpellier

MRI Physics/imaging biomarker development
Transforming how we image cancer

Research position:

Dr Stephanie Nougaret is recruiting a postdoctoral fellow to join the Pink (personalized imaging for new approaches in Kc care) group at the Montpellier Cancer Institute, University of Montpellier for a 3 year position with the possibility of further extension.

Trainees will join an ERC-funded project combining the resources of the Pink group, the microimaging platform and Montpellier Cancer Research Institute (IRCM). Trainees are encouraged to pursue their individual interests within the major goals of the project:

- 1) Creation of tumour moulds by 3D printing from the *in vivo* MRI images
- 2) MR acquisition of *ex vivo* tumours in a 9.4 T preclinical scanner (Agilent Varian 9.4/160/ASR, California, USA), including the development of novel pulse sequences, reconstruction methods, and sample preparation strategies for *ex vivo* MRI and its fusion with digital histopathology to better understand FTLD pathology
- 3) Image coregistration between *in vivo*, *ex vivo* MR images and histology (motion and distortion correction on MRI)
- 4) Leveraging results of *ex vivo* MRI and histopathology to develop novel pulse sequences and imaging protocols to acquire *in vivo* imaging biomarkers
- 5) Image processing of *in vivo* and *ex vivo* MR images and extraction of radiomics features

The fellow will be part of an interdisciplinary Deep/machine Learning Initiative applied to cancer imaging. The fellow will serve as collaborators on research projects as part of a team of researchers, data scientists, graduate students studying data science, imaging physics and undergraduates.

Context

High-grade serous ovarian cancer (HGSOC) is the most common subtype of ovarian cancer. For the initial management, no personalized interventions have been established, while HGSOC is very heterogeneous. There is a critical need for new biomarkers that capture this heterogeneity and support new target discovery for individualized therapy. Limitations in time and space of invasive biopsies

might be overcome by imaging. Radiomics has the potential for “whole tumor virtual sampling” using non-invasive examinations [1]. To date, no study has evaluated the value of MRI radiomics at macroscopic and microscopic scales to examine whether radiomics habitats are underpinned by tumor biology in HGSCO. This project MR O MICS, funded by an [ERC Starting Grant](#), aims at developing radiomics signatures and evaluating their associations with tumor heterogeneity. It will also investigate if radiomics allow the identification of distinct tumor areas that may underpin tumor biology.

The "Institut de Recherche en Cancérologie de Montpellier" (IRCM - U1194) is a research centre located on the Val d'Aurelle Hospital Campus of the Montpellier Regional Cancer Institute (ICM). The institute is represented by a major theme and two unifying programs: molecular targets and cancer therapies. Research projects in basic and translational biology are carried out in close collaboration with the clinical services and the clinical research department of ICM. The IRCM is constituted to 16 teams and 205 people.

The team is working as well in close collaboration with the Micro Imaging platform which include one vertical 4T, one 3T, one 9.4T and a nanoPETCT.

Skills / qualification

The candidate should have a Ph.D. in MRI Physics, Medical Imaging, Biomedical Engineering or related fields. High motivation and strong interest in medical imaging research. A track record of research in the acquisition and/or analysis of medical imaging data, particularly MRI, is preferred. Trainees are encouraged to pursue their individual interests within the major goals of the project.

Experiences in MRI methods, image processing (Matlab, Python) and analysis are required.

Contact

Applications should be sent to Stéphanie Nougaret (stephanie.nougaret@icm.unicancer.fr) and Marion Tardieu (marion.tardieu@umontpellier.fr) and include a CV, a motivation letter, and contact information of at least 2 referees for your work.

Start date

November 2023

References

[1] **Tardieu, Marion, et al.** "Assessing histology structures by ex vivo MR microscopy and exploring the link between MRM-derived radiomic features and histopathology in ovarian cancer." *Frontiers in Oncology* (2022): 5424.