

Postdoctoral research position BIOMAPS - University Paris-Saclay- France

Magnetic Resonance Imaging of the Skin with Optimized RF Coils (SKIN-COILS)

France-Austria ANR/FWF project (2024-2027)

French coordinator: Jean-Christophe Ginefri, Methodological and instrumental developments group, BIOMAPS, Université Paris-Saclay. jean-christophe.ginefri@universite-paris-saclay.fr

Austrian coordinator: Roberta Frass-Kriegl, MR physics group, CMPBME, Medical University Vienna. roberta.frass@meduniwien.ac.at

Project summary: Despite the theoretically high potential of MRI for skin imaging, to date, no suitable MR solutions are available due to both the lack of sensitivity of the MR radiofrequency system and the lack of specific acquisition protocols leading to strong SNR-related limitations.

In this context, we target the development of a **dedicated hard- and software package featuring highly sensitive RF coils and tailored acquisition protocols** for high-field clinical MR systems (3 T) **capable of providing high-resolution images of the skin and its vasculature** of great value for medical applications and investigations on healthy skin. To this end we will exploit a novel coil concept, recently introduced by our groups, referred to as “multi-loop coil (MLC)”, based on the use of small loops operated in series and that has shown sensitivity improvement at short distance inside the sample while maintaining a large lateral FOV.

In order to achieve the goals of this project, we will first investigate on the improvement of the magnetic efficiency of MLC coils together with the reduction of the two main noise sources in MRI. Then, selected MLC designs will be directly implemented to develop a clinically applicable MLC-array optimized for skin MRI and a highly spatially selective local transmit coil will be developed. In parallel, dedicated MR acquisition sequences with respect to pathology-related requirements will be developed, and the project will end with a pilot *in vivo* study to evaluate the performance of the novel hard- and software package developed in this project.

Postdoctoral position description and research profile: The recruited candidate should have a PhD in physics, medical physics, biomedical or electrical engineering with a strong expertise in RF coil development, from simulation to MR tests. She/he will fully contribute to development and optimization of the Skin-Coil layout regarding both magnetic efficiency and noise, and to its implementation and validation in a 3 T clinical MRI system. Finally, the candidate should have good written and oral communication skills in English. The postdoctoral researcher will be recruited at the beginning of the project for 18 months

Send your application (motivation letter, CV, list of publications, references) to Jean-Christophe Ginefri (jean-christophe.ginefri@universite-paris-saclay.fr)

