



4 Postdoctoral positions to conduct MR research on clinical 7T scanner at CRMBM MARSEILLE, France

Context: Located in the Medical School of Aix-Marseille University in Marseille, CRMBM is one of the greatest Magnetic Resonance Imaging centers in France. It is equipped with 3 preclinical MR scanners (4.7T, 7T and 11.75T) and 3 clinical MR whole-body MR scanners (1.5T, 3T, 7T) on its clinical site (CEMEREM) dedicated to research located within the University Hospital of la Timone (Marseille). Multidisciplinary teams (30 PIs) are developing and applying advanced MR techniques to characterize human pathologies of the CNS, MSK and CVS.

These present projects aim at developing MR explorations of ionic dysfunction (^{23}Na MRI), energetics (^{31}P) and metabolism (^1H MRS) of brain, spinal cord, heart and bone.



Position 2:

$^1\text{H}/^{31}\text{P}$ MR Spectroscopy of the Brain and Spinal Cord

Job description : the main objective of this postdoctoral position is to develop and implement ^1H and ^{31}P MRS methods for brain and spinal cord metabolic investigations at 7T (whole body Siemens system).

The work involves: (1) method development and optimization, (2) evaluation on healthy subjects, (3) data processing and (4) application of the methods to patients (multiple sclerosis, amyotrophic lateral sclerosis, degenerative myelopathy).

Candidate profile: we ideally seek for a highly motivated candidate with:

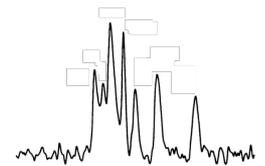
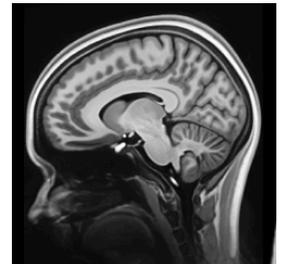
- . a Ph.D in physics, engineering or related disciplines,
- . experience with magnetic resonance spectroscopy ($^1\text{H}/^{31}\text{P}$ MRS),
- . good expertise in MR methods (pulse design, shim strategy, motion reduction, sequence implementation),
- . knowledge of Matlab, Python and C ++ programming languages,
- . hands-on experience with Siemens IDEA programming environment,
- . ability and willingness to work in an interdisciplinary team environment, as well as
- . good research record and excellent verbal and written english communication skills.

The position is available starting in **January 2019**.

Contacts: please send your motivation letter with statement of relevant experiences and key skills, full CV and contacts of 3 referees to:

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CENTRE DE RESONANCE MAGNETIQUE BIOLOGIQUE ET MEDICALE CRMBM



Assistance Publique
Hôpitaux de Marseille

Unité Mixte de Recherche AMU-CNRS N°7339

Position 3:

^1H MRI and ^{31}P MR Spectroscopy of the human bone at 7T

The Postdoc project will take place in the MSK group headed by D. Bendahan (david.bendahan@univ-amu.fr) at CRMBM-CEMEREM. The aim of the project will be to develop, optimize and evaluate an integrated imaging protocol aiming at quantifying mineral contents in human bone based on systematic comparisons between solid-state MRI at 7T and X-ray synchrotron-based technics. Initial experiments will be performed in anatomical samples using both techniques and the ultimate goal will be to design a specific MRI protocol which will be used in patients.

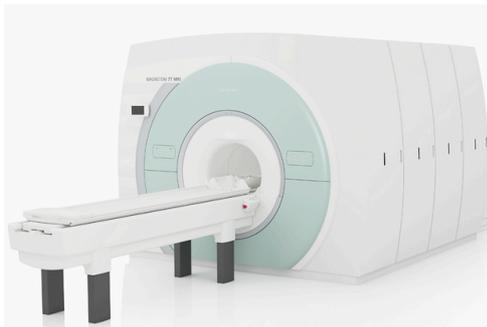
Candidate Profile:

The candidate is expected to have a solid background in the field of bone microarchitecture and mineralization and to be familiar with investigative techniques such as MRI and X-ray synchrotron-based technics. She/He will benefit from the methodological support of the lab regarding MRI acquisition and post-processing and of collaborators from the University of Bologna regarding X-ray synchrotron technics. She/he will have a PhD in the field of bone mineralization, bone physiology and should be familiar with X-ray synchrotron-based technics and MRI. Knowledge of Matlab, Python and C ++ programming languages will be appreciated. A great ability to work within a team is crucial.



Position 4: 2 year Post-Doc Position

Ultra-high Field X-Nuclei Cardiovascular MRI and MRS



A two-year post-doctoral position is open at CRMBM, Marseille, Provence, France. In this framework we aim at exploring phosphorus and sodium imaging and spectroscopy in parallel for cardiovascular applications.

In this framework we aim at exploring phosphorus and sodium imaging and spectroscopy in parallel for cardiovascular applications. The successful applicant will develop and apply **Phosphorus-31** MR spectroscopy techniques to the human heart. Specific strategies for handling cardiac and respiratory motion in phosphorus spectroscopy will be developed and evaluated. Both rapid single-voxel approaches

and Chemical Shift Imaging will be targeted. Advanced acquisition techniques and reconstruction approaches are in the scope of this project. On a second line, the usefulness of sodium imaging will be assessed in conjunction with imaging of high-energy metabolism by phosphorus MRS. Motion detection and handling will be a major development aspect of this subproject, too.

CRMBM has significant prior experience in MRS and CSI acquisition at 1.5 and 3.0T and with post-processing. The successful candidate will be welcomed by a development team of MR method scientists and engineers strongly interacting with specialized cardiovascular MRI application research groups and clinical departments. We offer an experienced and friendly team for support, and we make three clinical MRI scanners (Siemens Magnetom 7T, Avanto 1.5T and Verio 3T) available for the project. These systems are entirely dedicated to CRMBM's research. The 7T human scanner is equipped with a high-end dedicated cardiac TX/RX proton array. We look for candidates with good expertise in MRI method development. Knowledge in the field of cardiovascular MR and high-energy metabolism is an advantage. Experience with scientific programming environments like Python, Matlab or IDL will be necessary to reach the goals of this project, and experience with C/C++ is helpful.

CRMBM is located in the center of Marseille.

Competitive salary is covered by Aix-Marseille Université and includes health insurance and complete social coverage.

The position is available starting from October 2018. Please send your cv, and motivation letter to:

Frank Kober, Ph.D.

Director of Research at CNRS - Centre de Résonance Magnétique Biologique et Médicale

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