

CALL FOR APPLICATIONS (*)

International co-supervised PhD scholarship – Marseille / Montréal

Spinal Cord MRI and Biomechanics – Project C2

“Multi-modal analysis of the relationships between mechanical, structural, connectivity and functional alterations of the spinal cord in cervical spondylotic myelopathy and central canal syndrome”

(*) This research project has been selected by the NeuroSchool PhD program board of Aix-Marseille University (France). Over 7 projects, 3 PhD scholarships will be granted. For more information (call presentation and documents available for download), go to <https://neuro-marseille.org/en/Calls/international-co-supervised-phd-scholarships> and select the project C2.

Context: The combination of ultra-high field Magnetic Resonance Imaging (MRI) and biomechanical simulations offers great perspectives to understand the structuro-functional alterations occurring in patients with cervical spondylotic myelopathy (CSM) and central cord syndrome (CCS). To go beyond existing morpho-structural methodologies, we now propose: 1) to implement a robust 7T spinal cord (SC) functional MRI protocol to describe connectivity network alterations in compressed conditions; 2) to simulate the mechanisms of SC injury associated with CSM and CCS and 3) to investigate the relationships between MRI-based changes and biomechanical SC alterations to identify new biomarkers and thresholds of injury.

For this co-supervised project (50% in Marseille at CRMBM-CEMEREM, 50% in Montréal at ETS/Hôpital Sacré-Coeur), we seek for a highly motivated candidate, interested in working in a multidisciplinary environment with an international team. Our researches being conducted within the iLab-Spine, an International Associated Laboratory dedicated to Imaging and Biomechanics of the Spine and Spinal Cord, the candidate will have the opportunity to interact with biomechanics experts, physicians, neuroscientists as well as clinicians.

Candidate profile: Strong knowledge in Computational Neuroscience, signal processing, numerical simulation. Strong basic knowledge on MR experimentation, computational mechanics, ideally applied to the spine. Able to develop/optimize/validate proof-of-concept methodology for MR investigations and biomechanical simulations of spinal cord injury. Independent, highly motivated. Good tracking records and good references. Willingness to study and interact in a multidisciplinary environment, ability to work on an interdisciplinary project. - Please do not apply otherwise.

For more information on our labs in Marseille and Montréal:

<https://crmbm.univ-amu.fr/topic/spinal-cord-imaging/>

<https://www.etsmtl.ca/Chaires-de-recherche/CHAIRE-traumatologie-spinale>

PhD starting date: no later than December 2020 (3-year grant)

For more information and to apply (deadline May 3rd, 2020):

- 1) Go to : <https://neuro-marseille.org/en/Calls/international-co-supervised-phd-scholarships/>
- 2) Follow the steps indicated on the “Call for Application” menu
- 3) Select **Project C2 (Callot & Petit)**
- 4) Contact us ! send CV and motivation letter.

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