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An Earmarked Scholarship from the University of Queensland is available for a PhD project in Professor Jean-Levesque's laboratory at the Mater Research Institute – The University of Queensland, Brisbane, Australia. This Earmarked Scholarship is linked to a research project funded by the National Health and Medical Research Council of Australia until the end of 2023.
This PhD project will help delineate the mechanisms of neurogenic heterotopic ossifications following spinal cord injuries.

This project is advertised online at:
https://graduate-school.uq.edu.au/phd-scholarships-health
The successful candidate must commence by Research Quarter 4, 2021. You should apply at least 3 months prior to the research quarter commencement date. International applicants may need to apply much earlier for visa reasons. Applications can be submitted online at:
https://graduate-school.uq.edu.au/node/69/3#3
Applications will be scored by the university scholarship panel based on applicant's academic merit.

Title: Understanding the mechanisms of neurogenic heterotopic ossification following spinal cord injuries
Project description:
A frequent complication of spinal cord injuries is the growth of bones in muscles outside of the skeleton. These misformed bones usually develop around joints such as the knee, hip, elbow or shoulder and are called neurogenic heterotopic ossifications (NHO). NHOs occur in up to 25% of civilians suffering spinal cord injuries (mostly car/ sport accidents) and are extremely prevalent in soldiers who are victims of battlefield injuries affecting the spinal cord or brain, with these bones developing in up to 60% of cases. NHOs are very incapacitating, causing significant pain and gradual reduction in the range of motion of affected limbs often progressing to complete ankylosis of the affected joints.
There are still no effective pharmacological treatments to prevent or alleviate NHO development, and the pathogenesis of why NHO develop after a spinal cord injury remains poorly understood. Treatment is still limited to surgical resection of matured NHO, however surgery is very invasive and challenging as NHOs often entrap joints, large blood vessels and/or nerves. In order to understand NHO pathogenesis, our group established the first clinically relevant mouse model of NHO following spinal cord injury. Using our model, we have already unravelled fundamental mechanisms linking the original neurological lesion to NHO development and established that macrophages which infiltrate injured muscles, the expression of the pro-inflammatory cytokine oncostatin M, and subsequent JAK/STAT3 signalling pathway activation drive NHO pathogenesis.
Recently we have discovered that dysregulation of the neuro-endocrine and innate immune systems leads to muscle repair failure and NHO formation. This PhD project will further investigate how the neuro-endocrine and immune systems affect muscle stem cell fate during NHO development.

Preferred educational background: Bachelors with honours in the fields of cellular biology or molecular biology or immunology.

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