



Study of the immune activation of human neurons derived from iPSCs by digital holographic microscopy

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Prof. Marquet's Laboratory (<http://pnrlab.ca/>), within the framework of Canada Excellence Research Chair Program, has launched a strong program aiming at modeling the neurodevelopment component of major psychiatric diseases including schizophrenia, bipolar disorders and major depression disorder, using patient-derived induced pluripotent stem cells (iPSCs). The main goal of this research is to obtain a better understanding of the pathogenesis of these debilitating diseases for which there are only palliative treatments. Although the clinical manifestations of schizophrenia and autism spectrum disorders differ widely, these diseases share common environmental and genetic risk factors. One of these environmental factors is that maternal infection and / or immune activation during pregnancy increases the risk of psychosis or developing autism spectrum disorder in children. In fact, maternal immune activation in rodents has been used to model the characteristics of these two disorders. Yet, little is known about the processes involved in the link between an increased immune response to the development of the disease. A specific neurotransmitter called GABA is a major player in inhibitory activity in the brain. Its activity is altered in schizophrenia and autism spectrum disorders and is affected in animal models of maternal immune activation. Prof. Marquet's Laboratory is located at the CERVO Brain Research Centre (<https://cervo.ulaval.ca>), one of Canada's leading neuroscience and mental health centers, focusing on the root causes of brain diseases. The center brings together some sixty researchers in charge of research teams with more than 400 people, offering multidisciplinary expertise, ranging from membrane biophysics to social intervention, and the psychology of cognition

Details of the available position

A highly motivated candidate is sought to contribute to a new project addressing fundamental questions in neuronal differentiation, migration and maturation, in particular with regard to inhibitory neurons. Experimental approaches, including biochemistry, cell and molecular biology, and live cell imaging are used on iPSC-derived neurons from unique cohorts. The project is part of a very competitive research effort and offers excellent prospects for scientific career development. We offer an excellent team spirit in a transdisciplinary environment and work equipment at the cutting edge of technology.

The candidate will have to perform, among others, the following tasks:

- Develop and optimize protocols for the neuronal differentiation of human iPSCs.
- Design and perform experiments on human neuronal cells derived from iPSC with different techniques (immunocytochemistry, quantitative PCR, immunoblotting, flow cytometry, etc.) as well as with innovative very high resolution multimodal imaging approaches developed at laboratory
- Write and edit scientific articles
- Maintain knowledge of current developments in the field of research, in particular by attending conferences and workshops.

Qualifications required: Bachelor's degree in biochemistry, microbiology, biology, biomedical sciences, biotechnology. Any relevant training will be considered.

Documents required: Curriculum vitae and transcript

Send your documents to: isabelle.st-amour@fmed.ulaval.ca