



[Position for a PhD student to "discover new mechanisms of angiogenesis"](#)

Site : Research Centre, University of Montreal Hospital Centre (CRCHUM)
Department of Medicine
Faculté de Médecine, Université de Montréal,
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Laboratory of : Dr Isabelle Royal

web site: <http://www.chumtl.qc.ca/crchum/chercheurs/chercheurs-liste/royal-i.en.html>

Laboratory research theme: Intracellular signaling in angiogenesis and cancer

Project description: Function of the Gab1 and Gab2 scaffolding adapter proteins in angiogenesis

Our laboratory is interested in identifying molecular mechanisms regulating angiogenesis. Angiogenesis is the formation of new blood vessels from pre-existing vasculature. Although this is essential for normal embryonic development and wound repair, its deregulation is associated with the progress of several diseases including cancer. In this context, angiogenesis contributes to the growth of aggressive tumors and the formation of metastases. To develop effective means of blocking the growth of tumor-associated blood vessels in order to block tumor progression, we therefore need to understand the molecular events that underlie their formation. With this in mind, we are proposing to deepen our understanding of the molecular mechanisms regulating angiogenesis with special emphasis on proteins called Gab1 and Gab2, which represent important signal amplifiers in cells. We have identified Gab1 and Gab2 scaffolding adapter proteins as important regulators of angiogenic responses of endothelial cells to VEGF *in vitro*, including cell survival, migration and capillary formation. Therefore, one of our next goals is to investigate Gab's roles during *in vivo* angiogenesis and tumor progression. To do this, the proposed project will involve the generation of mice in which the Gab1 and Gab2 genes are deleted from blood vessel cells (conditional knockout). These mouse models will then be used to demonstrate the roles of Gab1/2 in angiogenesis, tumor-associated angiogenesis, and the ability of tumor cells to grow and metastasize. The knowledge generated should lead to the identification of Gab proteins as new potential therapeutic targets for the development of novel strategies to block angiogenesis and tumor growth.

References :

1. Laramée, M., Chabot, C., Cloutier, M., Stenne, R., Holgado-Madruga, M., Wong, A. and **Royal, I.** (2007) The scaffolding adapter Gab1 mediates vascular endothelial growth factor signaling and is required for endothelial cell migration and capillary formation. **J. Biol. Chem.** 282: 7758-7769.
2. Chabot, C., Spring, K., Gratton, J.P., Elchebly, M., and **Royal, I.** (2009) New role for the protein tyrosine phosphatase DEP-1 in AKT activation and endothelial cell survival. **Mol. Cell. Biol.** 29: 241-253.
3. Caron, C., Spring, K., Laramée, M., Chabot, C., Cloutier, M., and **Royal, I.** (2009) Non-redundant roles of the Gab1 and Gab2 scaffolding adapters in VEGF-mediated signaling, migration, and survival of endothelial cells. **Cell. Signal.** 21: 943-953.

Disciplines/ Qualifications: Candidates should have a formal training in **molecular and cellular biology and in vivo mouse work**, have excellent organizational, interpersonal, and communication skills, and have a strong interest **in the study of the molecular mechanisms regulating angiogenesis.**

Contact: Applicants should submit a resume, university records, a short statement of research interests, TOEFL results and two letters of recommendation to **Dr Isabelle Royal** by email (isabelle.royal@umontreal.ca), if possible in one .pdf document.

Collaboration: Collaboration is also possible with a former supervisor or another researcher in that field.