



PhD Positions

Position: Two (2) PhD positions are currently available to study Leydig cell differentiation and function.

Description: Steroid hormones regulate essential physiological processes and inadequate levels are associated with various pathological conditions including hormone-dependent cancers, PCOS, and autoimmune and inflammatory diseases. Life-threatening conditions such as atherosclerosis, metabolic syndrome and diabetes have also been linked to testosterone deficiency. Steroid hormone synthesis in Leydig cells is finely regulated to avoid conditions of hormone insufficiency or excess. Although signals controlling Leydig cell differentiation and function have been characterized, the intracellular signalling pathways and the molecular mediators/transcription factors downstream of these pathways remain poorly understood.

Our work revealed the existence of two pathways that are instrumental for LH responsiveness. First, an activating pathway requiring CAMKI, and second a cell autonomous repression pathway involving AMPK. We have also identified several novel transcription factors (MEF2A/D, COUP-TFII, FOXA3, NUR77) that regulate key genes required for steroid hormone synthesis and Leydig cell function. Various projects are available involving the characterization of the CAMKI and AMPK signalling pathways and the roles and mechanisms of action of these transcription factors in testis formation, male sex differentiation and Leydig cell differentiation and function.

The projects will involve molecular and cellular biology approaches (cell lines and primary Leydig cells, immunohistochemistry, siRNA, promoter analysis, DNA-protein and protein-protein interaction, intracellular signalling), gene editing (CRISPR/Cas9), animal models (transgenic mouse, cre-lox KO), and proteomic (TAP-LC-MS/MS) and genomic (ChIP-Seq, microarray/RNA-Seq) approaches.

This work is supported by a grant from the Canadian Institutes of Health Research.

Prerequisite: Hold a BSc or MSc degree in biochemistry, microbiology, biology, biotechnology, or any related discipline. Experience in cell biology and molecular biology techniques is an asset. Applicants should have a strong motivation for basic biomedical research and good communication skills (English, French). All those interested should send their CV along with contact info for 2 references by email to Jacques-J.Tremblay@crchudequebec.ulaval.ca. Only selected candidates will be contacted.

Beginning: Winter and/or Summer 2016

Duration: Studentships are available for a period of 4 years (Ph.D.).

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