Department of Molecular and Cellular Biology

Graduate Seminar MCB*6500

Friday, Sept. 14, 2018 in SSC 1511 @ 12 noon

presented by:

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"Molecular characterization of human and mouse neuronal SOCE and its implications in bipolar disorder"

Due to the pivotal role calcium plays as a secondary messenger, the endoplasmic reticulum (ER) sequesters free cytosolic calcium into easily accessible sinks for immediate use. Refilling of these stores once they are depleted is regulated by store-operated calcium entry (SOCE) in non-excitable cells, which has been further shown to shape the activity of many calcium-dependent processes. Because neurons express a wide range of calcium channels other than store-operated channels, SOCE was previously considered to be redundant in this cell types, but recent evidence suggest instead that this pathway is rather active and provides a distinct contribution to neuronal signaling and function. Despite these recent advances, however, many questions about neuronal SOCE remain, in particular relating to the role that co-factor proteins may be playing in modulating this pathway. Another area of interest concerns the possible contribution of SOCE dysregulation to the pathogenesis and/or pathophysiology of certain brain disorders.

My research will explore these two specific topics using a multidisciplinary approach. Precisely, for my first project my plan is to use an RNAi screening approach and mouse primary neurons to identify putative SOCE protein interactors implicated in the activation/deactivation of this pathway. My second project will be to explore the possible role of SOCE in relation with bipolar disorder using patient-derived induced pluripotent stem cells (iPSCs) differentiated into neural precursor cells (NPCs) and cortical-like neurons. Together, these two projects will provide new insights about the role of this calcium pathway to neuron biology in health and disease.