ANNOUNCEMENT

Interested Members of the University community are invited to attend the Final Oral Examination for the degree of Master of Science of

**Ashutosh Patel**

of the Department of Biomedical Sciences (Ontario Veterinary College) on Tuesday, August 21st at 9:00am in Biomedical Sciences Room 1642 (Seminar); and OVC Main Building Room 3648 (Examination)

**Muscarinic Receptor Isoforms Differentially Regulate the Excitability of Medial Prefrontal Cortex Layer 6 Pyramidal Neurons in CD-1 mice**

**Examination Committee**
- Dr. Craig Bailey, Advisor
- Dr. Tarek Saleh, Committee Member
- Dr. Jibran Khokhar, Graduate Faculty
- Dr. Glen Pyle, Exam Chair

**Advisory Committee**
- Dr. Craig Bailey
- Dr. Tarek Saleh
- Dr. Neil MacLusky

**ABSTRACT**

Cholinergic signalling within the medial prefrontal cortex (mPFC) plays an important modulatory role in mPFC-dependent cognitive functions. This role is mediated by acetylcholine (ACh) activation of nicotinic (nAChR) and muscarinic (mAChR) receptors, which work together to regulate neuron function within the mPFC. Although pyramidal neurons in mPFC layer 6 express nAChRs that have been characterized thoroughly, they also express mAChRs that have not yet been investigated in detail. Using whole-cell electrophysiology in mouse brain sections, this thesis describes a physiological and pharmacological characterization of mAChR function in mPFC layer 6 neurons. ACh activation of
mAChRs mediates a transient inhibitory response that is strongest in young postnatal life and mediated by M1, M2, and M3 isoforms, and a prolonged excitatory response that is not developmentally regulated and mediated primarily by M1 and M3 isoforms. To our knowledge, this work describes the first detailed characterization of mAChRs in mPFC layer 6.

PRESENTATIONS

Patel AV, and Bailey CDC (2017) Muscarinic Receptor Isoforms Differentially Modulate the Excitability of Medial Prefrontal Cortex Layer VI Neurons. Southern Ontario Neuroscience Association (Provincial)

PUBLICATIONS


Patel AV, and Bailey CDC. Transient Muscarinic Inhibitory Responses are Mediated by Excitatory M1 and M3 Muscarinic Receptor Isoforms Within the mPFC Layer 6 Neurons. Manuscript in preparation.

BIOGRAPHICAL DATA

Ashutosh Patel graduated from the University of Toronto in 2015 with an Honours Bachelor of Science degree specializing in Neuroscience with a double major in Psychology and Human Biology. His interest in research developed while completing two undergraduate research projects with investigators at the University of Toronto and the Centre for Addiction and Mental Health. Ashutosh enrolled in the Master of Science program in Biomedical Sciences and Neuroscience with Dr. Craig Bailey in January 2017. His research focuses on elucidating the molecular mechanisms underlying acetylcholine signalling within the developing prefrontal cortex.

AWARDS RECEIVED

Lyle and Louise Rea Graduate Entrance Scholarship in Pharmacology (W2017)