University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

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BSc (University of Victoria, 2011)

"Low-frequency Stimulation Inducible Long-term Potentiation at the Accessory Olfactory Bulb to Medial Amygdala Synapse of the American Bullfrog"

Department of Biology (Neuroscience)

Monday, September 28, 2015
10:00 A.M.
Human and Social Development Building
Room A264

Supervisory Committee:
Dr. Kerry R. Delaney, Department of Biology, University of Victoria (Supervisor)
Dr. Gantam B. Awatramani, Department of Biology, UVic (Member)
Dr. Brian Christie, Department of Biology, UVic (Member)

External Examiner:
Dr. Paul Zehr, School of Exercise, Science, Physical and Health Education, UVic

Chair of Oral Examination:
Dr. Ulrich Mueller, Department of Psychology, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

The mitral cells of the accessory olfactory bulb (AOB) of anuran frogs project their axons directly to the medial amygdala (MeA) along the accessory olfactory tract. An *en bloc* preparation of the telencephalon of the American bullfrog *Lithobates catesbeiana* was utilized to study a form of low-frequency inducible long-term potentiation (LTP) expressed at the synapse formed between the terminals of the accessory olfactory tract and the neurons of the MeA. Delivery of repetitive 1Hz-stimulation and sets of 5Hz tetani to the accessory olfactory tract both induced potentiation that was stable for over an hour, as measured by extracellular field recordings. LTP induced by 5Hz tetanus was associated with a decrease in paired-pulse ratio, which would be consistent with an increased probability of release contributing to the increased synaptic strength observed. Blockade of neither NMDA nor kainate glutamate receptors, with AP5 and UBP310 respectively, prevented LTP induction by 5Hz tetanus; however expression of LTP was partially masked in the presence of UBP310. These results suggest that kainate receptors are involved in the expression of LTP at the AOB-MeA synapse, though the means by which LTP is induced remains unclear.