University of Victoria | Graduate Studies

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

of

ANNA EPP

BSc (University of British Columbia Okanagan, 2015)

"Role of a novel C-terminal motif in Pannexin 1 trafficking and oligomerization"

Division of Medical Sciences

Thursday, February 14, 2019
1:00 P.M.
Medical Services Building
Room 210

Supervisory Committee:
Dr. Leigh Anne Swayne, Division of Medical Sciences, University of Victoria (Supervisor)
Dr. Craig Brown, Division of Medical Sciences, UVic (Member)
Dr. Chris Nelson, Department of Biochemistry and Microbiology, UVic (Outside Member)

External Examiner:
Dr. John Burke, Department of Biochemistry and Microbiology, UVic

Chair of Oral Examination:
Ms. Merrie Klazek, School of Music, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Pannexin1 (Panx1) is a metabolite channel enriched in the brain and known to localize to the cell surface, where it is involved in a variety of neuronal processes including cell proliferation and differentiation. The mechanisms through which Panx1 is trafficked or stabilized at the surface, however, are not fully understood. Previous research suggests that a region within the proximal Panx1 C-terminus (Panx1CT) is necessary for cell surface expression of Panx1. Using the ScanProsite tool under high sensitivity settings, I discover a previously unreported leucine-rich repeat (LRR) in the proximal Panx1CT. As LRRs are known to form larger domains that mediate interactions with various ligands – and therefore possibly involved in regulation of protein trafficking – I investigated the involvement of this region in Panx1 localization. Deletion of the LRR or just the highly conserved segment of the LRR resulted in a significant loss of Panx1 cell surface expression. Further, the LRR was required for interactions between the Panx1CT and a number of lipids important for membrane trafficking and endocytosis. Finally, ectopic expression of Panx1-EGFP in HEK293T cells increases cell proliferation, but this is not the case for mutants lacking a full LRR. Overall these findings provide new insights into the interactions and trafficking of Panx1, a fascinating ion channel.