Announcement:

All interested members of the university community are invited to attend the Final Oral Examination for the degree of Master of Science of

LOVE SANDHU

on Tuesday, February 5, 2019 at 1:30 p.m. in SSC 3317

Thesis Title: Characterization of cardiac actin gene editing in zebrafish using CRISPR-Cas9 technology

Examination Committee:
Dr. F. Brauer, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. J. Dawson, Dept. of Molecular and Cellular Biology
Dr. T. Van Raay, Dept. of Molecular and Cellular Biology
Dr. R. Shapiro, Dept. of Molecular and Cellular Biology

Advisory Committee:
Dr. J. Dawson (Adv)
Dr. T. Gillis
Dr. T. Van Raay

Abstract: Cardiomyopathy is a common cause of heart failure. Two prevalent forms of cardiomyopathy are hypertrophic cardiomyopathy (HCM) and dilated cardiomyopathy (DCM), characterized by changes to the myocardium. The development of HCM and DCM has been associated with mutations found in genes encoding muscle proteins, including cardiac actin (ACTC1). To better understand how these mutations lead to disease my research focused on the development of zebrafish as an in vivo model to study the underlying molecular mechanisms leading to the development of cardiomyopathy. Three zfactc genes have been identified through literature and phylogenetic analysis: zfactc1a, cardiofunk (zfacta1b), and zfactc1c. To validate zfactc genes as cardiac-specific, I used CRISPR-Cas9 to characterize editing these genes in zebrafish embryos. Research about the role of cardiac actin in cardiomyopathy development using zebrafish is translatable to humans because zebrafish and human ACTC proteins share 99 % sequence identity. This work will determine the roles of zfactc genes in cardiac development and for future human ACTC rescue experiments.

Curriculum Vitae: Love obtained her Bachelor Degree (Hons) in Biology at the Wilfrid Laurier University. She began her M.Sc. program in the lab of Dr. John Dawson in the fall of 2016.

Awards: Roche Molecular Biochemical Award of Excellence - April 2017
