Name: Thane Martin

Title: The Effect of Dietary Salt on Vascular Health

Supervisor: Dr. Mark Rakobowchuk, PhD.

Committee Members: Dr. Heidi Huttunen-Hennelly, PhD. , Dr. Laurent Mourot, PhD.

Abstract:

Cardiovascular diseases are the second highest cause of death in Canada. As a result, a lot of research has been devoted to finding the factors behind it. High dietary salt intake has been implicated as a major cause of cardiovascular disease, with most Canadians consuming more than the recommended amount. Linked to increased blood pressure, arterial stiffness and worsened cardiovascular health, there are many possible underlying mechanisms. All cells have a sugar rich layer on their surface called the glycocalyx including the endothelial cells lining blood vessels. This layer can be damaged, leading to the dysfunction of these cells. In addition to influencing blood vessel function, the glycocalyx stores sodium from our diet, meaning damage may lead to issues with sodium regulation and increased risk of cardiovascular disease. Two study phases will be completed, the first examining sodium loading in individuals, followed by an intervention phase which aims to remedy the expected salt induced blood vessel dysfunction. How well vessels dilate with a rapid increase in blood flow, blood markers of glycocalyx breakdown, and how an exercise bout influences these relationships are all examined. The intervention phase also involves salt loading but has participants potentially alter salt interactions through dietary fibre supplementation. The goal of this treatment is to find if the negative effects of high dietary sodium can be prevented. Over 30% of high blood pressure cases in Canada are linked to high sodium intake and expanding our understanding of how it interacts with blood vessels may show potential improvement strategies.