

LAY ABSTRACT

A large consensus of research suggests that consumption of a high-intake diet of plant foods, such as fruits and vegetables, is associated with a decreased risk of cardiovascular disease, stroke, and hypertension. Plant foods contain a wide range of cardiovascular-protective nutrients and numerous phytochemicals are present that may influence vascular health. Consumption of diets rich in flavonoids have been inversely associated with cardiovascular disease risk in several epidemiologic studies. One particular class of flavonoids, the flavanols, including their monomers and oligomeric procyanidins, have recently been reported to modulate a number of cardiovascular-related processes, including improvements in vascular reactivity, platelet reactivity, oxidant defenses, and positive modulation of immune indices. Consumption of flavanol-rich foods, such as red wine, grapes, tea, and cocoa, has been associated with positive cardioprotective effects with respect to vascular function in a number of dietary intervention studies.

The major goals of this project are to develop new approaches and test hypotheses related to the study of the actions of flavanols on the composition and conformation of lipids and apolipoprotein E (apoE) in triglyceride-rich lipoproteins (TGRL), and endothelial cell injury. Our previous work has provided key observations and feasibility data leading to the development of this project. We have developed a suite of molecular, cellular, and biophysical methodologies that are particularly well suited to test hypotheses related to TGRL and endothelial cells in response to high and low flavanol intake in postmenopausal women.

The data obtained from these studies will increase our understanding of how flavanols modify TGRL and regulate signaling in endothelial cells. We have an established team that has been working together for a number of years and are well positioned to conduct these experiments. This combination of investigators and approaches provides us a unique platform to pursue the study of lipid and lipoprotein interactions with vascular tissues and their regulation by flavanols, with a goal of achieving better treatments for atherosclerotic cardiovascular disease.