# Uptake and effects of Quercetin in L929 cells

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My project this summer was focused on the characterization of the glucose transporter protein GLUT1. There are several diseases that can attribute part of their success to compromised glucose uptake. Two of the most debilitating, cancer and diabetes, show significant potential in incorporating glucose uptake treatments into effectively curing these disease. Several of these compounds have been extensively studied by previous members of the Louters' Lab. The compound I worked with this summer was Quercetin. Quercetin is a flavonoid antioxidant naturally found in many fruits and vegetables. A flavonoid is a plant pigment that gives fruits, vegetables and even flowers their potent colors. Antioxidants can neutralize free radicals in the body, which damage cell membranes and DNA and can even cause cell death. There is evidence in the literature that quercetin helps combat many things; these include high cholesterol, heart disease, hypertension, and allergies. My main goal this summer was to document the interaction between GLUT1 and quercetin. I also spent a significant portion of my summer working on the characterization of the relationship between GLUT1 and several other inhibitors, including WZB117 and BAY-876.

The methods I used predominantly this summer were glucose uptakes and flow cytometry. Glucose uptakes, by way of a radioactively labeled analog of glucose, allow us to measure glucose uptake in a population of cells. This allows us to analyze how glucose uptake is affected by the cells being exposed to certain inhibitors. Flow Cytometry on the other hand allows for single cell analysis by way of fluorescence. Quercetin, due to its highly conjugated pi systems, is naturally florescent. After performing experiments, the Flow Cytometer data would allow us to quantify how much quercetin had been transported or bound to the cell surface.

Through my work this summer, I was able to learn a great deal about GLUT1 and its various inhibitors. In the case of Quercetin, I was able to add further to the understanding of its transport. With WZB117, I was able to identify the minimal dose needed to significantly inhibit the transportation of glucose. I was also able to generate evidence for where on the transport protein the compound binds. As with all good research, my experiments answered one or two questions and left me with several more in their place. For quercetin, these questions pertained to being able to distinguish between transport and binding of the compound.

For me personally, this summer of research deepened my love of research. It challenged me intellectually in working on being able to synthesize of raw information from many research papers to thoughtful experiments. Being in a laboratory setting presents an opportunity for dynamic learning, I was able to ask real-time "Why?" questions that lead to a deeper understanding of the work I was doing. That excitement is not easily recreated in a classroom. It is a great privilege not only to be able to work in a research lab but also to work in an environment that is centered on Christ.