

## **BCHM 421/422 – 2018/2019**

**Project Outline:** Our long-term research goal is to understand the *molecular, regulatory, and functional properties of key enzymes of plant carbohydrate and phosphate metabolism*. Current objectives include assessing the influence of seed development or environmental stressors such as nutritional phosphate deprivation on the function, regulation, post-translational modifications, protein:protein interactions, and subcellular targeting of key enzyme proteins. BCHM421/422 projects may involve enzyme purification and characterization, metabolite quantification, immunological tools (western blotting &/or co-immunoprecipitation using specific antibodies), or molecular/genomic approaches such as mRNA profiling, recombinant enzyme expression and analysis, and studies of transgenic plants in which key enzymes we have characterized have been ‘knocked out’ or overexpressed. All of these approaches are highly relevant to a wide variety of careers in the biological sciences and ag-biotech industry. Full time summer 2018 employment as research assistant may be available for well qualified students who are interested in completing BCHM421/422 research projects with us beginning next Sept. (for more info please visit the Plaxton Lab website at: <http://post.queensu.ca/~plaxton/> ).

**Supervisor:** William Plaxton (Biosciences Complex, room 3513)

**Project Title:** Plant Biochemistry & Molecular Biology

### **Keywords (3-5):**

- 1. Metabolic control**
- 2. Protein kinase**
- 3. phosphoenolpyruvate carboxylase**
- 4. Purple acid phosphatase**
- 5. Post-translational modification**

**Project Goals:** specific goals/objectives for BCHM 421/422 project will be developed by summer of 2018

**Experimental Approaches:** Phosphoprotein purification, immunoblotting, enzymology, cDNA cloning and transcript profiling

### **References:**

- 1.** O'Leary B, Plaxton WC (2017) Mechanisms and Functions of Post-translational Enzyme Modifications in the Organization and Control of Plant Respiratory Metabolism. In. "Plant Respiration: Metabolic Fluxes & Carbon Balance" (G Tcherkez & J Ghashghaie, Eds.). Advances in Photosynthesis and Respiration. Springer. (DOI: 10.1007/978-3-319-68703-2)
- 2.** Plaxton WC, Shane MW (2015) The Essential Role of Post-translational Enzyme Modifications in the Metabolic Adaptations of Phosphorus-Deprived Plants. Chpt. 4 of "Phosphorus Metabolism in Plants" (WC Plaxton & H Lambers, Eds). *Annual Plant Reviews*. Vol. 48, Wiley; pp. 99-123 (DOI: 10.1002/9781118958841)