

## Crystallization of two alpha-glucosidases found in *Bacteroides thetaiotaomicron*

Clarisse Reid, Nicole Fraser, and David Rose

University of Waterloo, Waterloo, Ontario, Canada

*Bacteroides thetaiotaomicron* is a dominant member of the colon microbiota that has been used as a model organism of the symbiotic host-organism relationship and the digestive breakdown potential of digested plants. The primary responsibility of *B. thetaiotaomicron* is the hydrolysis of digested polysaccharides. Two enzymes that are crucial in this process are BT\_0339 and BT\_3299. BT\_0339 and BT\_3299 are alpha-glucosidases that belong to the glycoside hydrolase family 31 (GH31). GH31 is a large group of enzymes that hydrolyze the glycosidic bond between two or more carbohydrates or a carbohydrate and a non-carbohydrate moiety. GH31 is one of two major enzyme families (the other being GH13) that contain alpha-glucosidases. Many different enzymes originating from *B. thetaiotaomicron* have been historically crystallized. The focus of this project is to study the crystalline structures of BT\_0339 and BT\_3299 to gain insight regarding enzyme-substrate interactions. Preliminary crystallization conditions have been determined and are currently being manipulated to permit analysis of the enzyme-to-substrate interactions.

### References

- [1] Chaudet, M. M. (2016). *Starch Glycan Utilization by the Colon Microbiota: Structural and biochemical insights into starch digestion and the role of the colon microbiota*. Waterloo: University of Waterloo.
- [2] Chaudet, M. M., Allen, J.-L., & Rose, D. R. (2012). Expression and purification of two Family GH31 alpha-glucosidases from *Bacteroides thetaiotaomicron*. *Protein Expression and Purification*, 135-141.