

## Poster Presentation

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### *SusD-like protein from the human gut bacterium *Bacteroides thetaiotaomicron**

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Nutritional research is continually demonstrating the strong interaction between the human colon microbiota and a healthy digestive system 1. It has been shown that this intestinal microbial population can influence our state of health including our metabolism, nutrient production and absorption, and the development of our immune system<sup>2</sup>. These symbiotic organisms have an important role in the metabolism of human dietary carbohydrates and exist by utilizing these sugars, which are not readily digested by upstream human enzymatic mechanisms. The ability of these microbes to utilize these sugars can also impact digestive disease states that include obesity, irritable bowel disorder, colonic cancer and Type 2 diabetes<sup>3</sup>. A dominant member of this environment is the bacterium *Bacteroides thetaiotaomicron* and has been characterized as efficiently utilizing carbohydrates in the colon. This symbiont has been shown to have a large repertoire of proteins and enzymes that have been predicted to be strongly involved in the capture and degradation of dietary sugars. In this study we focused on assessing the impact of a specific SusD-like protein on the utilization of dietary sugars. Biochemical evidence, as well as preliminary structural data provides support that this carbohydrate binding protein is capable of binding various dietary sugars. These interactions enable this bacterium to capture sugars derived from the colon and provide an available substrate for membrane bound glycoside hydrolases. The information gathered in this study can shed light on a part of digestion that is unclear at this point in time and create a connection between diet composition and its affect on a dominant member of the gut microbiota.

[1] X. He, M.L. Marco, and C.M. Slupsky, *Perspectives of food and nutrition on gut microbiota*, *Journal of agricultural and food chemistry*, 2013, 61, 9559-9574., [2] J.C. Clemente, K.L. Ursell, L.W. Parfrey, et al. *The impact of the gut microbiota on human health: an integrative view*, *Cell*, 2012, 148, 1258–70., [3] V. Tremaroli, and F. Bäckhed, *Functional interactions between the gut microbiota and host metabolism*, *Nature*, 2012, 489, 242–9.

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