



## DISCOVERING THE FUNCTIONS OF THE HUMAN MICROBIOME

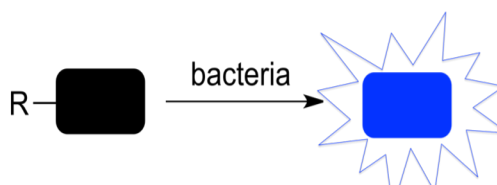
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Humans are a habitat for a fraction of the millions of kinds of bacteria. These bacteria influence many functions of the human body, like the metabolic pathway. Yet, there is little understanding of the chemical activities of the human microbiome. Research has shown that they play a critical role in drug metabolism, predominantly through reductive and hydrolytic reactions. Although bacterial enzyme activity is important in maintaining human health, there is no current way to easily monitor their chemical functionalities in complex microbial samples. In this project, we aim to create a panel of fluorogenic substrates that can be used to identify activities of the bacterial enzymes of the human microbiome.

The panel of substrates is tested with a sample, and against their own set of controls. According to what bacterial enzymes are present, different substrates become fluorescent because their R groups have been hydrolyzed or reduced (Figure 1). Bacterial samples are from Dr. Round's lab from the Department of Pathology at the University of Utah. Unique profiles have already been created for the different bacterial strains tested from this panel.

Figure 1. General scheme for detecting enzyme activity using fluorogenic substrates.



Currently, researchers simply assess what bacteria are present. Thus, adding the ability to detect bacterial enzymatic activities of a complex sample would be complementary to existing methods that identify the strains in a bacterial sample. This will be very valuable to the field of medicine.



