

PROJECT FACT SHEET

Understanding bacteria involved in periodontal disease

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Enzyme inhibitors are types of molecules that can decrease enzyme activity. Inhibiting enzyme activity achieves a number of effects that are beneficial in medicine including complementing the action of antibiotics.

Recently, Stephen Bearne, a member of the faculty in the Department of Biochemistry & Molecular Biology at Dalhousie University, conducted a proteome survey (survey of proteins) and mass spectrometry analysis (molecular study) to look at the glucose and amino acid metabolism in *Fusobacterium varium* (a bacterium found in the human gut and related to *Fusobacterium nucleatum*, an organism that plays a role in periodontal disease). Such research aims to understand metabolism in this bacterium, with the goal of understanding its role in the ecosystem of the human gut.

Dr. Bearne's team found that *F. varium* can simultaneously use both glucose and L-glutamate as energy sources but the sugar, and not the amino acid, is the preferred growth environment. Not only did concentrations of the six identified enzymes increase in response to the presence of glucose, but concentrations of other enzymes also rose when L-glutamate was the major energy source.

"These studies provide the first evidence for the presence of a nutrient-responsive mechanism governing gene expression in *F. varium*," said Dr. Bearne.

The study also looked at the changes in the soluble proteome accompanying the use of other amino acids as the major growth substrates. Evidence for an additional pathway for glutamate utilization induced by L-glutamate was also obtained.

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