William H. Bowen Lectureship

October 29, 2009
1:30-2:30 PM
Upper Auditorium, 3-7619

"Catabolite Modification of Gene Expression in *Streptococcus mutans*"

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Rapid and efficient coordination of carbohydrate catabolism is emerging as a critical factor for colonization, persistence and virulence of a spectrum of bacterial pathogens. In Gram-positive bacteria, the sugar:phosphotransferase system, which consists of Enzyme I, the phospho-carrier protein HPr and a panel of carbohydrate-specific Enzyme II permeases, works in conjunction with catabolite control protein A (CcpA) to legislate the uptake and metabolism of a variety of energy sources through transcriptional and allosteric regulatory circuits. The oral pathogen *Streptococcus mutans* is particularly adept at exploiting its ability to acidify the environment by fermenting many different carbohydrates to gain a selective advantage in oral biofilms. Using molecular genetic, physiologic and biochemical approaches, we show here that catabolite-dependent regulation of gene expression and carbohydrate transport in *S. mutans*, while similar in many respects to established paradigms, has fundamental peculiarities that distinguish *S. mutans* from even closely-related species. These critical differences in control of carbon metabolism have global consequences and likely enhance the ability of the organism to thrive under the adverse and continually-fluctuating conditions that occur during caries development in humans.

Please contact Jose_Lemos@urmc.rochester.edu with any questions concerning this presentation.