

Research holds promise of therapeutic approach for gum disease

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University of Louisville researchers are a step closer to eliminating periodontal disease through their work to develop synthetic molecules that prevent a bacteria responsible for the disease from spreading throughout the mouth.

The discovery could lead to the formulation of a mouth rinse, toothpaste or tooth varnish to prevent the pathogen from establishing itself orally.

Donald Demuth, PhD, associate dean for research and enterprise, UofL School of Dentistry, received a patent today for his work to develop [peptides](#) that inhibit the interaction between *P. gingivalis* and [Streptococcus gordonii](#) and prevent *P. gingivalis* colonization of the mouth. Peptides are molecules formed when two or more [amino acids](#) join together; they are the building blocks of proteins in a cell.

"When *P. gingivalis* enters the oral environment, it seeks out interaction with the bacterium *S. gordonii* – an otherwise benign organism – in order to lay the ground work to propagate and ultimately gain a foothold below the gum line, leading to periodontal disease.

"UofL Oral Health and Systemic Disease Group director Richard Lamont characterized this bacterial interaction and based on those studies, my team developed a series of peptides that prevent *P. gingivalis* and *S. gordonii* from coming together," Demuth said.

Demuth found that administering the peptide in an animal model

prevented *P. gingivalis* related bone loss – the clinical symptom of periodontal disease -- and prevented the spread of the [bacterium](#) in the mouth.

"This is one of the first examples of a potential targeted therapeutic approach that may control [periodontal disease](#)," he said.

Demuth is building his research through collaboration with Frederick Luzzio, PhD, professor, UofL College of Arts & Sciences, Department of Chemistry. They hope to further develop organic molecule structures that mimic the active peptides.

"The molecules must be potent and cost effective to manufacture. We know of no chemical technology on the market that targets specific oral [pathogens](#), and this is an exciting endeavor," Luzzio said.

Luzzio and Demuth have a patent pending on certain discoveries related to this research. The investigators are working with the Office of Technology Transfer at UofL to find an industrial partner to license and commercialize the technology.

Provided by University of Louisville

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