

Researchers suspect bacterial changes in mouth promote oral disease in people with HIV

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Oral disease occurs commonly and progresses rapidly among people who have HIV, but the process is poorly understood. Researchers suspect that the culprit is a change in the makeup of bacterial communities that live in the mouth.

Through a one-year grant of almost \$330,000 from the National Institutes of Health, researchers at the University of Florida are trying to find out the role of various [pathogens](#) in the progression of oral disease among people infected with [HIV](#).

“The hypothesis is that suppression of the immune system by HIV contributes to changes in the oral biota, which then contributes to [oral disease](#),” said Dr. Gary Wang, an assistant professor of infectious diseases in the UF College of Medicine, and principal investigator of the study. “The whole idea is to be able to understand the microbial signature early — before patients develop disease. That could lead to development of novel molecular tools and biomarkers to screen for disease.”

Estimates vary widely, but up to two-thirds of people who have HIV also have periodontitis, according to a literature review in the journal *Periodontology* 2000.

For patients whose immune system is compromised, periodontitis

further contributes to poor health by hindering proper nutrition. It also affects the ability to derive pleasure from eating.

About 500 to 700 different species of oral microorganisms have been identified, and one person can have up to 100 different species in the mouth. In most cases those bacteria do no harm, and may in fact provide benefit by crowding out disease-causing bacteria. Communities of bacteria thrive in a thin film on the teeth, with different types of organisms clustering together into neighborhoods based on mutual benefit.

“There’s really not a place for an opportunist pathogen to get a foothold,” said Clay Walker, a professor of oral biology in the UF College of Dentistry and co-investigator in the study.

But when the immune response is compromised, as in HIV-infected patients, a shift in the composition of microorganism communities can allow opportunistic pathogens to grow freely.

The UF team will examine those changes through a pilot study of HIV-positive and HIV-negative individuals who have chronic periodontitis.

The work is being carried out in collaboration with the Periodontal Disease Research Center, whose director is study co-investigator Dr. Nils Ingvar Magnusson, a professor of oral biology in the College of Dentistry.

The researchers will use sophisticated DNA sequencing techniques and bioinformatics to classify bacteria and identify differences between those in the two groups of patients. They also plan to track how bacterial composition in the mouth changes as people’s immune status changes.

“We’re interested in getting a definitive answer on whether there are

differences in the bacteria associated with periodontitis in patients with HIV and in patients without HIV,” Walker said.

Previous analyses comparing periodontitis in people with HIV and in people without HIV have found no difference in the bacterial composition in the mouth. But today there are more sensitive molecular tools that have much greater ability to detect subtle differences.

A better knowledge of the microbe population in the mouth would enable the design of antimicrobials that are active against particular species of pathogens.

“If we do find that there are differences between the two, we may be able to use specific treatments to shift the flora or eliminate certain segments that may not be beneficial,” Walker said.

Provided by University of Florida

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