

Gingivitis bacteria manipulate your immune system so they can thrive in your gums

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A new research report published in the *Journal of Leukocyte Biology* shows how the bacteria known for causing gum disease—*Porphyromonas gingivalis*—manipulates the body's immune system to disable normal processes that would otherwise destroy it. Specifically, the report shows that this pathogen prompts the production of the anti-inflammatory molecule Interleukin-10 (IL-10). This, in turn, inhibits the function of T-cells, which would otherwise help to protect the host from this particular microbial infection.

"Since greater than 50 percent of the U.S. population over 50 years-of-age develop adult periodontal disease, we hope that the results of our study will ultimately help in the development of novel treatments that could prevent or ameliorate the chronic infection caused by the pathogen *P. gingivalis*," said Jannet Katz, D.D.S., Ph.D., a researcher involved in the work from the Department of [Pediatric Dentistry](#) at the University of Alabama in Birmingham.

To make this discovery, scientists used cells from mice that were exposed to *P. gingivalis*. One portion of the cells was treated with an inhibiting antibody against IL-10 and the other portion of cells was not treated. All of the cells were then tested for interferon gamma production. An increase of [interferon gamma](#) production was seen in the treated cells, but no increase was found in the untreated cells. These findings suggest that the damage done by *P. gingivalis* happens when the [immune cells](#) of the host are first exposed to this pathogen, and further implies that for treatment to be successful, it must be started as early as

possible. This study highlights the mechanism by which *P. gingivalis* can establish a chronic infection in the form of periodontal disease and provides insight into how the disease develops. Results also demonstrate the importance of very early intervention either by eradication of the bacterium with specifically designed therapeutics or by prevention via the development of an effective vaccine.

"Gum diseases and the infections that cause them can be incredibly stubborn and difficult to treat," said John Wherry, Ph.D., Deputy Editor of the [Journal of Leukocyte Biology](#). "What isn't as well known is why these infections are so difficult to eradicate. These new studies now demonstrate that these bacteria go beyond merely evading our body's defenses and actually manipulate our immune systems for their own survival."

More information: Dalia E. Gaddis, Craig L. Maynard, Casey T. Weaver, Suzanne M. Michalek, and Jannet Katz. Role of TLR2-dependent IL-10 production in the inhibition of the initial IFN- γ T cell response to *Porphyromonas gingivalis*. *J. Leukoc. Biol.* January 2013 93:21-31; [doi:10.1189/jlb.0512220](https://doi.org/10.1189/jlb.0512220)

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