

# Bacterium that causes gum disease packs a 1-2 punch to the jaw

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The newly discovered bacterium that causes gum disease delivers a one-two punch by also triggering normally protective proteins in the mouth to actually destroy more bone, a University of Michigan study found.

Scientists and oral [health care providers](#) have known for decades that bacteria are responsible for periodontitis, or gum disease. Until now, however, they hadn't identified the bacterium.

"Identifying the mechanism that is responsible for periodontitis is a major discovery," said Yizu Jiao, a postdoctoral fellow at the U-M Health System, and lead author of the study appearing in the recent issue of the journal *Cell Host and Microbe*.

Jiao and Noahiro Inohara, research associate professor at the U-M Health System, worked with William Giannobile, professor of dentistry, and Julie Marchesan, formerly of Giannobile's lab.

The study yielded yet another significant finding: the bacterium that causes gum disease, called NI1060, also triggers a normally [protective protein](#) in the oral cavity, called Nod1, to turn traitorous and actually trigger bone-destroying cells. Under normal circumstances, Nod1 fights harmful bacterium in the body.

"Nod1 is a part of our protective mechanisms against bacterial infection. It helps us to fight infection by recruiting neutrophils, blood cells that act as bacterial killers," Inohara said. "It also removes harmful bacteria

during infection. However, in the case of periodontitis, accumulation of NI1060 stimulates Nod1 to trigger neutrophils and osteoclasts, which are cells that destroy bone in the oral cavity."

Giannobile, who also chairs the Department of Periodontics and Oral Medicine at the U-M School of Dentistry, said understanding what causes [gum disease](#) at the molecular level could help develop personalized therapy for dental patients.

"The findings from this study underscore the connection between beneficial and [harmful bacteria](#) that normally reside in the [oral cavity](#), how a harmful bacterium causes the disease, and how an at-risk patient might respond to such bacteria," Giannobile said.

**More information:** [www.cell.com/cell-host-microbe/abstract/S1931-3128%2813%2900147-9?switch=standard](http://www.cell.com/cell-host-microbe/abstract/S1931-3128%2813%2900147-9?switch=standard)

Provided by University of Michigan

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