

## More evidence vitamin D boosts immune response

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Laboratory-grown gingival cells treated with vitamin D boosted their production of an endogenous antibiotic, and killed more bacteria than untreated cells, according to a paper in the June 2011 issue of the journal Infection and Immunity. The research suggests that vitamin D can help protect the gums from bacterial infections that lead to gingivitis and periodontitis. Periodontitis affects up to 50 percent of the US population, is a major cause of tooth loss, and can also contribute to heart disease. Most Americans are deficient in vitamin D.

His interest piqued by another laboratory's discovery that vitamin D could stimulate white blood cells to produce natural proteins that have antibiotic activity, Gill Diamond of the UMDNJ—New Jersey Dental School, Newark, showed that vitamin D could stimulate lung cells to produce LL-37, a natural antibiotic protein, and kill more <u>bacteria</u>. That suggested that , vitamin D might help cystic fibrosis patients. Next, in the new research, he showed that vitamin D has the same effct on gingival cells.

Then, Diamond found that vitamin D also stimulates gingival cells to produce another protein, called TREM-1, which had not been well-studied, but which was thought to be made by white blood cells. He found that it boosts production of pro-inflammatory cytokines.

The new research also showed that vitamin D coordinates expression of a number of genes not previously considered to be part of the vitamin D pathway. Those genes may be involved in additional infection-fighting



pathways. A more comprehensive understanding of how vitamin D carries out this regulation at the molecular level—something Diamond hopes to investigate—will enable targeted therapies using vitamin D, he says.

Interestingly, Diamond also found that lung and <u>gum</u> cells appear to have the ability to activate inactive forms of vitamin D, says Diamond. "This means that we may even be able to use vitamin D therapy topically, if that proves true."

Vitamin D has become a hot area of research in recent years. In addition to infectious diseases, studies suggest that it has protective effects against autoimmune diseases, and certain cancers.

Diamond says that after he began conducting research on vitamin D, he began taking it as a supplement. Since then, "I have had only one cold in four years, and that one lasted only three days," he says. "Other people I've met who have done the same have seen similar results. We are trying to figure out how it's working, and what other infectious diseases can be mitigated by it."

**More information:** L. McMahon, et al., 2011. Vitamin D-mediated induction of innate immunity in gingival epithelial cells. *Infect. Immun.* 79: 2250-2256.)

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