

Unusual immune cell needed to prevent oral thrush

September 8 2014

An unusual kind of immune cell in the tongue appears to play a pivotal role in the prevention of thrush, according to the researchers at the University of Pittsburgh School of Medicine who discovered them. The findings, published online today in the *Journal of Experimental Medicine*, might shed light on why people infected with HIV or who have other immune system impairments are more susceptible to the oral yeast infection.

Oral thrush is caused by an overgrowth of a normally present fungus called *Candida albicans*, which leads to painful white lesions in the mouth, said senior investigator Sarah L. Gaffen, Ph.D., professor, Division of Rheumatology and Clinical Immunology, Pitt School of Medicine. The infection is treatable, but is a common complication for people with HIV, transplant recipients who take drugs to suppress the [immune system](#), chemotherapy patients and babies with immature [immune](#) systems.

"In previous work, we found the cytokine interleukin-17 (IL-17), a protein involved in immune regulation, must be present to prevent the development of thrush," Dr. Gaffen said. "But until now, we didn't know where the IL-17 was coming from."

Typically, IL-17 is produced by immune T-cells that learn to recognize and remove a foreign organism after an initial exposure, known as adaptive immunity. But unlike humans, mice do not normally acquire *Candida* during birth and are considered immunologically naïve to it.

When the researchers exposed the lab animals to *Candida*, their IL-17 levels rose within 24 hours despite the lack of a T-cell response. This suggested the [immune activity](#) was innate, rather than acquired.

To find the cell responsible for IL-17 secretion, lead investigator Heather R. Conti, Ph.D., devised a way of applying a scientific technique called flow cytometry to sort for the first time cells gathered from the oral tissues. In the tongue, she identified unusual ones known as natural TH17 cells that looked very much like T-cells but didn't behave like them. Subsequent tests showed that the novel cells did, indeed, make IL-17 when exposed to *Candida*.

"These cells are part of a natural host defense system that is present at birth and does not require a first exposure to be activated," Dr. Gaffen explained. "This study demonstrates for the first time that natural TH17 cells protect against infection."

The researchers speculate that the similarities natural TH17 cells share with T-cells make them vulnerable to HIV, chemotherapy and other agents as well, which could explain why certain people are more susceptible to [oral thrush](#). Also, new drugs that block IL-17 soon will be on the market for treatment of rheumatologic conditions, so it's possible that thrush could be a side effect.

The team plans to examine the factors that influence thrush development within the high-risk groups.

Provided by University of Pittsburgh Schools of the Health Sciences

Citation: Unusual immune cell needed to prevent oral thrush (2014, September 8) retrieved 23 April 2024 from <https://medicalxpress.com/news/2014-09-unusual-immune-cell-oral-thrush.html>

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