Basis of Immunity to Oral Thrush, Common in AIDS, Identified by UB Researchers

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(PhysOrg.com) -- Oral thrush, a hallmark symptom in AIDS patients, is caused by a type of yeast that grows unchecked in people with weakened immune systems, and appears in colonies of white patches in the mouth.

AIDS is characterized by the progressive loss of T cells -- cells that originate in the thymus and are a critical component of the immune system. A particularly important type of T cell is known as the T helper, or Th cell.

Research carried out at the University at Buffalo has shown for the first time that a recently identified type of Th cell, known as Th-17, is the principle defense component required for immunity to oral thrush.

"Our studies showed that mice lacking Th-17 cells, but not other types of T cells, develop severe oral thrush," said Sarah L. Gaffen, Ph.D., senior author on the study.

"These TH-17 deficient mice showed a major defect of the early white blood cell, the neutrophil, in the response to yeast infection," said Gaffen. "Moreover, in vitro studies showed their saliva had a reduced ability to kill Candida albicans, the yeast responsible for oral thrush and most HIV-related oral infections."

Results of the research appear in the current online issue of the *Journal of Experimental Medicine*.

"It is unlikely that IL-17 ever could be used therapeutically to treat thrush," noted Gaffen "because it almost certainly would trigger a major deleterious inflammatory reaction in the recipient. We found this to be the case when we tried to do it in mice.

"However, antibodies against IL-17 are in clinical trials for treating psoriasis, rheumatoid arthritis and other autoimmune diseases, so understanding the possible side effects of this treatment, such as thrush, is important."

Heather R. Conti, Ph.D., a student in the Department of Oral Biology at the UB School of Dental Medicine, is first author.

The research was conducted in Gaffen's laboratory and in the laboratory of Mira Edgerton, D.D.S., Ph.D., UB research professor of oral biology. Gaffen has since left UB to take a position at the University at Pittsburgh. The research is continuing at UB under Edgerton, a specialist in C. albicans.

The discovery of TH 17's specific role in oral thrush is an important step in the understanding of autoimmune diseases, said Gaffen.

"Developing knowledge about the molecules that contribute to host defense versus pathology is very important for gaining a fundamental understanding of the immune system, but also because we need to understand the consequences of therapies that target these proteins that serve as messengers between cells and regulate various inflammatory responses."

Studies carried out elsewhere in a rare group of humans with genetic deficiencies in Th-17 cells also get thrush, verifying that the findings in mice also apply to humans, Gaffen noted.

Additional UB contributors to the study were Fang Shen, Namrata Nayyar, Eileen Stocum, Jianing N. Sun, Matthew J. Lindemann, Allen Hoe, Justine Hoda Hai, Ji Won Jung, and Patricia Masso-Welch. Scott G. Filler, from the David Geffen School of Medicine at UCLA, also was a contributor.

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