

# Researchers at Case Western Reserve discover a new way the body fights fungal infection

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A team of researchers led by Amy G. Hise, M.D., M.P.H., assistant professor at the Center for Global Health and Diseases, Case Western Reserve University School of Medicine, is the first to discover how the body fights off oral yeast infections caused by the most common human fungal pathogen, *Candida*.

As [fungal infections](#) become more resistant to current drugs, this groundbreaking research may directly lead to the development of new drugs and therapies that will help limit and/or prevent *Candida* infections in the future for millions of sufferers.

*Candida albicans* is the most common species of the *Candida* fungus and is the leading cause of vaginal and oral yeast infections, including thrush and denture stomatitis. It is the fourth most common hospital acquired bloodborne pathogen in the United States and surprisingly, it is present in the mouths of 30 to 50 percent of healthy adults.

Because of the widespread nature of *Candida*, the potential for overgrowth and infection is common in the young, elderly, immunocompromised and people receiving corticosteroid or chemotherapy treatments.

The findings, published in *Cell, Host and Microbe*, identified the critical role of a protein, interleukin-1 $\beta$  or IL-1 $\beta$ , secreted by a variety of cells in

the human immune system to protect the body from oral colonization by *Candida albicans* and preventing it from spreading to infect host tissue and blood. The study defines the precise mechanism by which the body's immune cells produce IL-1 $\beta$  following contact with *Candida albicans*. Further, it shows that a complex of proteins, collectively termed the NLRP3 inflammasome, function to produce IL-1 $\beta$  from an inactive, precursor form into a form that can be secreted by cells and subsequently function to modulate the immune system and its responses.

This research clarifies a number of mechanisms and pathways that may be therapeutic targets to help alleviate and/or eliminate *Candida* overgrowth and its accompanying symptoms, such as pain and discomfort, swelling, burning sensation of affected area, difficulty swallowing, in individuals suffering from infections.

The findings of Dr. Hise's laboratory will open many new avenues of research in fungal infections. One direction they are pursuing is to identify the way that the fungus activates the inflammasome. This might provide new targets for drug development. Another area of interest is the investigation of how small differences between individuals in immune related genes, called single nucleotide polymorphisms or SNPs, affect susceptibility to fungal and other infections.

"If we can identify patterns of SNPs that make people more likely to develop life-threatening fungal infections, it may be possible in the future to use these as markers to screen patients. For example, patients admitted to intensive care units or needing long-term invasive catheters could be genetically screened to identify who would benefit from preventive anti-fungal treatment," says Dr. Hise.

Source: Case Western Reserve University ([news](#) : [web](#))

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