

# Scientists unlock secrets of protein produced by disease-causing fungus

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A team that includes scientists from the School of Medicine at The University of Texas Health Science Center at San Antonio, Johns Hopkins University and St. Mary's University reported the structure of a protein that helps a common fungus to infect the body.

The fungal pathogen *Candida albicans* causes [yeast infections](#), diaper rashes and oral thrush, and is the most common [fungal pathogen](#) to infect humans. It can also cause a life-threatening infection of the blood called disseminated candidiasis.

"In this study, we determined the three-dimensional structure of a never-before-seen cell wall [protein](#) called SOD5 that the organism uses as a defense against the human immune system," said P. John Hart, Ph.D., the Ewing Halsell-President's Council Distinguished Professor of biochemistry at the UT Health Science Center and Research Scientist in the South Texas Veterans Health Care System.

"SOD5 is a copper-only protein that exhibits significant structural differences from copper/zinc superoxide dismutases (SODs)," Dr. Hart said. "Because SOD5 molecules are widespread throughout fungi, including *C. albicans*, but are not found in humans, the structural differences can be exploited to develop compounds that specifically target SOD5 to treat a number of widespread fungal infections."

Current conventional antifungal treatments such as fluconazole can be toxic to the liver in certain individuals, he noted.

"SOD5 is an unprecedented, very powerful antioxidant protein that enables *C. albicans* to ward off [free radicals](#) of the host immune response," said study senior author Valeria Culotta, Ph.D., professor of biochemistry and molecular biology and environmental health sciences at the Johns Hopkins University Bloomberg School of Public Health. Free radicals are highly reactive molecules that can cause oxidative damage.

The finding was published April 7 online ahead of print by the journal *Proceedings of the National Academy of Sciences*.

Provided by University of Texas Health Science Center at San Antonio

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