New compounds may control deadly fungal infections

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An estimated 25,000 Americans develop severe fungal infections each year, leading to 10,000 deaths despite the use of anti-fungal drugs. The associated cost to the U.S. health care system has been estimated at $1 billion a year.

Now two Syracuse University scientists have developed new brominated furanones that exhibit powerful anti-fungal properties.

The most virulent fungus is *Candida albicans*, which is carried by about 75 percent of the public. Typically the fungus is harmless but, in individuals with HIV or otherwise compromised immune systems, it can cause candidiasis, which has a high mortality rate. The fungi can also form biofilms that attach to surfaces and are up to 1,000 times more resistant to anti-fungals.

"These new furanones have the potential to control such infections and save lives," says assistant professor Dacheng Ren of the Department of Biomedical and Chemical Engineering in SU's L.C. Smith College of Engineering and Computer Science. "In our tests, they reduced fungal growth by more than 80 percent, and we hope to improve on that going forward."

Ren and his collaborator, chemistry professor Yan-Yeung Luk of SU's College of Arts and Sciences, have filed a non-provisional patent application. They have also published related results in the *Journal of Applied Microbiology and Biotechnology*.

Over the past 20 years, pathogenic fungi have developed growing resistance to anti-fungal drugs. This stimulated a strong demand for more effective drugs and led to the successful research at Syracuse. The researchers' genomic study suggests that furanones have different genetic targets than current anti-fungal agents and thus may avoid drug resistance acquired in the past.
The research team has also shown previously that these furanones inhibit bacterial biofilm formation; thus they may help control chronic infections where biofilms often appear, on surgical, dental and other implants.

Ongoing furanones research at Syracuse University will investigate a broad spectrum of other potential capabilities, ranging from diverse medical uses, such as controlling bacterial and fungal biofilms, to anti-fungal wood preservatives for the building materials market.

Provided by Syracuse University