

New drug formulation could treat *Candida* infections

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Candida albicans. Credit: Wikipedia.

With antimicrobial resistance (AMR) increasing around the world, new research led by the University of Bristol has shown a new drug formulation could possibly be used in antifungal treatments against *Candida* infections.

Candida albicans, a well-known yeast usually seen in the mouth, skin, gut and vagina, is reported to form biofilms and cause mild to life threatening infections. Fluconazole, an antifungal drug widely used to treat *Candida* infections is completely ineffective in treating *Candida* biofilms and new drugs are needed to treat them. However, unlike antibiotics, developing antifungal drugs is very challenging because [yeast cells](#) are structurally similar to human cells, as a result, there is a greater chance of unwanted side effects with new antifungal drugs. A better alternative would be to improve the efficiency of currently approved antifungal drugs such as fluconazole but with minimal side effects.

Recent studies have shown that microorganisms can communicate with each other using various chemical signals. Some microorganisms use these

signals to control other competing microorganisms and these signals could potentially be used as antimicrobial drugs.

In the study, published in *International Journal of Pharmaceutics*, the researchers investigated whether using some of these microbial signals from bacteria could improve the activity of fluconazole against *Candida* biofilms.

The research team found that a specific chemical signal released from a major bacterial pathogen can be successfully used to significantly improve the activity of fluconazole against *Candida* biofilms by packaging them to small lipid molecules and delivering them together.

The pioneering research is one of only a few studies to demonstrate the possibility of using naturally existing microbial compounds against other pathogenic microorganisms.

Dr. Nihal Bandara, Lecturer in Oral Microbiology from the Bristol Dental School and corresponding author, said: "It is well known that microorganisms live as "slime" communities, called "microbial biofilms", and are responsible for up to 80 per cent of all infections in humans. These microorganisms are extremely difficult to remove even with the most effective antimicrobial drugs. They can lead to a significant number of deaths and disabilities to patients and can be a healthcare and [financial burden](#) to economies around the world.

"It was really exciting to discover that we can use various signals released by [microorganisms](#) against others to control infections."

The research team would like to develop the technique used in the study and investigate the efficacy of new [drug](#) formulation using an [animal model](#).

In the future, it is hoped researchers and

pharmaceutical industries will explore the antimicrobial properties of microbial chemical signals so they can be developed into cost effective treatments.

More information: H.M.H.N. Bandara et al, A novel, quorum sensor-infused liposomal drug delivery system suppresses *Candida albicans* biofilms, *International Journal of Pharmaceutics* (2020). DOI: [10.1016/j.ijpharm.2020.119096](https://doi.org/10.1016/j.ijpharm.2020.119096)

Provided by University of Bristol

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