Fighting fungal infections with bacteria

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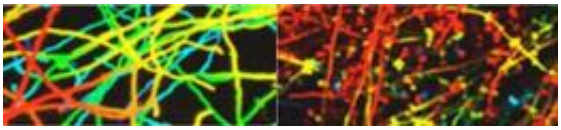

This is a confocal microscope image of fungal biofilm without (left) or with (right) treatment by bacteria. Credit: Gordon McAlester

A bacterial pathogen can communicate with yeast to block the development of drug-resistant yeast infections, say Irish scientists writing in the May issue of *Microbiology*. The research could be a step towards new strategies to prevent hospital-acquired infections associated with medical implants.

Researchers from University College Cork in Ireland studied the interaction between the bacterium Pseudomonas aeruginosa, which is often associated with severe burns, and the yeast *Candida albicans*, which can grow on plastic surfaces such as catheters. Both microbes are very common and although they are normally harmless to healthy individuals, they can cause disease in immunocompromised people.

The team discovered that molecules produced by P. aeruginosa bacteria were able to hinder the development of *C. albicans* 'biofilms' on silicone, when the yeast cells clump together on the surface of the plastic. Interestingly, the interaction between the two organisms did not depend on the well-studied bacterial communication system called Quorum

Sensing, indicating that a novel signalling mechanism was at play.

C. albicans is the most common hospital-acquired fungal infection and can cause illness by sticking to and colonising plastic surfaces implanted in the body such as catheters, cardiac devices or prosthetic joints. This biofilm formation is a key aspect of *C. albicans* infection and is problematic as biofilms are often resistant to the antibiotics used to treat them. Dr John Morrissey, who led the team of researchers, said, "*Candida albicans* can cause very serious deep infections in susceptible patients and it is often found in biofilm form. It is therefore important to understand the biofilm process and how it might be controlled."

Dr Morrissey believes his work may lead to significant clinical benefits. "If we can exploit the same inhibitory strategy that the bacterium P. aeruginosa uses, then we might be able to design drugs that can be used as antimicrobials to disperse yeast biofilms after they form, or as additives onto plastics to prevent biofilm formation on medical implants ," he said. "The next steps are to identify the chemical that the bacterium produces and to find out what its target in the yeast is. We can then see whether this will be a feasible lead for the development of new drugs for clinical application."

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