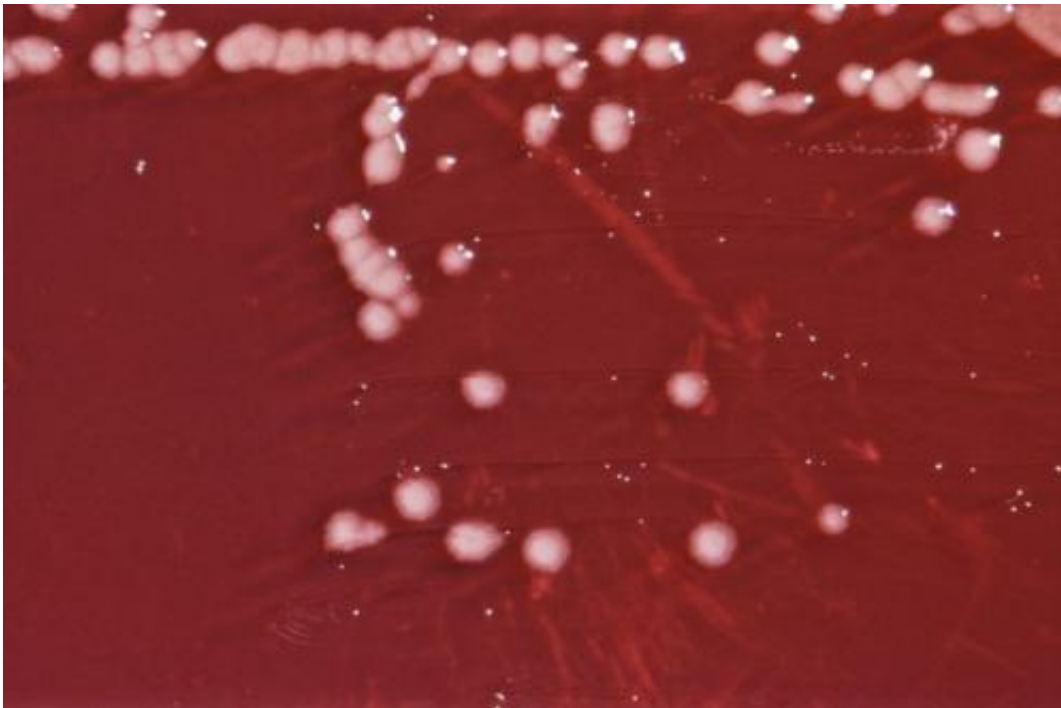


Bid to beat superbugs boosted by immune defence discovery

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Pseudomonas aeruginosa bacterial culture on an Xylose Lysine Sodium Deoxycholate (XLD) agar plate. Credit: CDC/public domain

The fight against superbugs could be helped by the discovery of a potential therapy based on the body's natural immune defences.

Scientists have found that a molecule produced by the body—called LL-37—changes the way cells behave when they are invaded by

bacteria.

The molecule acts like a fire alarm, experts say, warning the body's immune system of the infection and the need for urgent action.

The team, from the University of Edinburgh's Centre for Inflammation Research, focused on lung diseases caused by bacterial infections, which are a major cause of death worldwide.

These infections are increasingly resistant to antibiotics, making them difficult to treat.

Previous studies with mice found that LL-37 instructs cells in an infected lung to call in specialised cells, known as neutrophils, which can destroy bacterial threats.

In tests on human lung cells, researchers found that LL-37 specifically targets infected cells, revealing the danger and producing a signal that summons the neutrophils.

At the same time, this flood of LL-37 into the infected cells causes them to self-destruct, removing the threat to other healthy cells before the bacteria can grow and spread.

Experts say this discovery could lead to new approaches to treat these multi-drug resistant infections.

Dr. Donald J. Davidson from the MRC Centre for Inflammation Research said: "Our search for alternative and complementary treatments for antibiotic-resistant infections is becoming ever more urgent. Trying to boost the best of the human body's effective natural defences, like this, may prove to be an important part of our future solutions."

The study, published in the journal *PLoS Pathogens*, was funded by the Medical Research Council.

More information: Brian J. McHugh et al, Cathelicidin is a "fire alarm", generating protective NLRP3-dependent airway epithelial cell inflammatory responses during infection with *Pseudomonas aeruginosa*, *PLOS Pathogens* (2019). DOI: 10.1371/journal.ppat.1007694

Provided by University of Edinburgh

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