Unlocking bacteria's survival aid

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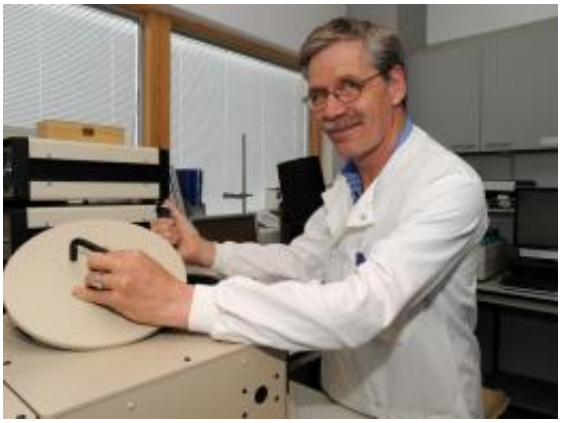

(PhysOrg.com) -- Scientists have worked out how to control a protective mechanism found in many bacteria that helps them grow and stay alive.

In a finding that is hoped will help the future development of new antimicrobial drugs, researchers have revealed they are able to manipulate the protein or channel that protects *E.coli,* Salmonella, Legionella, which causes Legionnaires' disease, and *Pseudomonas*, which can affect cystic fibrosis patients and sufferers of other chronic lung conditions.

All bacteria have channels that aid their survival by protecting them when they are threatened or under attack.

Last year Ian Booth and Tarmo Roosild at the University of Aberdeen, Nevada Cancer Institute in Las Vegas and the Salk Institute in San Diego published a paper that explained the mechanics of these channels, which stay shut if all is normal, but spring open to help protect bacteria against potential toxins.

Now these scientists, in collaboration with Stuart Conway at the University of Oxford, have taken their findings another step forward.

In a new study, which appears in the journal Proceedings of the National Academy of Sciences USA, they describe how a synthetic chemical can force the channel to stay open — which then stunts the bacteria's growth.

The researchers were also able to test their ideas by modifying the channel so that it could be opened or closed by other chemicals.

Both studies have been supported by the Wellcome Trust, which has now awarded £1.5 million to the Universities of Aberdeen, Oxford and St Andrews to further develop these findings.

Professor Ian Booth, Professor of Microbiology at the University of Aberdeen's Institute of Medical Sciences, has been researching *E.coli* for more than 30 years.

He said: "After discovering last year how these protective channels in bacteria worked, our next goal was to devise chemicals that could trick the channel in the bacterium into staying open, slowing its growth, or force it to remain closed, which undermines its defences.

"We have been able to achieve this in a move that is really significant as we see these channels, found in many pathogenic bacteria, as a target for the development of new antimicrobial drugs.

"With new funding from the Wellcome Trust we will develop our understanding of these channels with the aim of creating potential new drugs to tackle a range of bacteria which has become more resistant to antibiotics."

Dr. Stuart Conway, from the Department of Chemistry at the University of Oxford, said "We are very excited about applying our chemical tools to the study of fundamental biological problems, which may ultimately allow us to develop new leads for novel antibiotic drugs."

Professor James Naismith from the Biomolecular Sciences Building at the University of St Andrews said: "The Wellcome Trust Grant is a real boost as it allows us to continue this very productive collaboration. It is an exciting combination of chemistry, biology and structural biology."

Provided by University of Aberdeen