Medical Xpress

Garlic extract could help cystic fibrosis patients fight infection

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A chemical found in garlic can kill bacteria that cause life-threatening lung infections in people with cystic fibrosis, research suggests.

The study is the first to show that the chemical - known as allicin - could be an effective treatment against a group of infectious bacteria that is highly resistant to most antibiotics.

Allicin is produced naturally by garlic bulbs to ward off a closely-related group of plant pathogens found in soil and water habitats. In the 1980s, the bacteria - known as the Burkholderia cepacia complex (Bcc) - emerged as a cause of serious and transmissible lung infections in people with cystic fibrosis.

Measures to limit the spread of Bcc infections among people with cystic fibrosis have brought the number of cases down considerably. However, current therapies available to treat infections - that are potentially fatal - are limited and require the use of combinations of three to four antibiotics at a time.

Researchers found that allicin - which can be extracted by crushing raw garlic - inhibits the growth of bacteria and, at higher doses, kills the plant pathogens. The team suggests that allicin kills Bcc bacteria by chemically modifying key enzymes. This deactivates them and halts important biological processes within the pathogens' cells.

The team believes allicin-containing remedies could be used in combination with existing antibiotics to treat Bcc infections. However, the researchers say it is important to pinpoint the mechanisms by which allicin kills the bacteria before the chemical can be incorporated into new treatments.

The Bcc are highly versatile plant and human pathogens that have not been studied to the same extent as other superbugs - such as MRSA - the team says.

The bacteria produce potent antimicrobial agents which kill bacteria and fungi, making them naturally drug-resistant and allowing them to survive in polluted and antibiotic-rich environments.

The team says the Bcc also have a range of potential uses in the

agriculture industry.

The study, published in the journal *PLoS One*, was funded by the University of Edinburgh and the Biotechnology and Biological Sciences Research Council.

Professor John Govan, of the University of Edinburgh's Centre for Infectious Diseases, who co-led the study, said: "At a time when novel antimicrobial agents are urgently required, chemical and microbiological research has the potential to unlock the rich reservoir of antimicrobial compounds present in plants such as garlic. Allicin-containing compounds merit further investigation as adjuncts to existing treatments for infections caused by Bcc."

Dr Dominic Campopiano, of the University of Edinburgh's School of Chemistry, said: "The medicinal power of garlic has a rich history that dates back thousands of years but the chemical structure of allicin was only revealed in the 1940s. Our work suggests that modern methods should be used to further expand our knowledge of this enigmatic molecule and rejuvenate its potential applications."

Provided by University of Edinburgh