MedicalXpress

Researchers identify what makes MRSA lethal

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(PhysOrg.com) -- Scientists studying the so-called "superbug" MRSA have identified one of the components responsible for making it so deadly.

Staphylococcus aureus is a type of bacteria commonly found on the skin that is relatively harmless unless it gets into the bloodstream, where it can cause blood poisoning and create abscesses in organs such as the heart and brain.

MRSA, or Methicillin Resistant Staphylococcus aureus, can be particularly dangerous because it is resistant to treatment with most antibiotics.

Researchers at the University of Bath, in collaboration with the Universities of York and Gothenburg, investigated how the bug moves from the bloodstream to invade organs in the body.

They studied Fibronectin Binding Protein (FnBP), a protein on the surface of the bacterium that enables it to bind to human cells and infect them.

The Wellcome Trust-funded study, published in the open access journal PLoS Pathogens, proved for the first time this protein is central to the bacteria's ability to invade the organs.

The next step of their research will be to try and stop the bacteria

invading human cells by using antibodies to block FnBP binding.

Dr Andrew Edwards, a postdoctoral researcher from the University of Bath's Department of Biology & Biochemistry, explained: "The 3D shape of FnBP interested us because it contains a portion that's repeated lots of times in the overall structure. We wanted to find out why it needs so many repeats.

"We found that although only one repeat was needed to bind to cells, altering the protein to contain a smaller number of repeats reduced the strength of binding and resulted in a less severe infection."

Dr Ruth Massey, Senior Lecturer from the University of Bath's Department of Biology & Biochemistry, added: "If we can develop a treatment that blocks the binding of FnBP to cells, it could help stop the infection spreading to the major organs in the body.

"Whilst such a treatment wouldn't kill the bacteria, it could be used in parallel with antibiotics to stop the infection becoming more dangerous and spreading to the patient's organs."

The researchers will spend the next three years working to block FnBP binding, and predict that a treatment for patients could be developed in as little as a decade.

More information: Journal paper: www.plospathogens.org/article/info%3Adoi%2F10.1371%2Fjournal.ppat.1000964

Provided by University of Bath