

# Protection for stressed-out bacteria identified

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An international team of researchers is a step closer to understanding the spread of deadly diseases such as listeriosis, after observing for the first time how bacteria respond to stress.

The research, published in the October issue of the prestigious international journal *Science*, details how a huge molecule called a stressosome protects bacterial cells from external stress and danger.

Scientists from the University of Newcastle in Australia, and Newcastle University and Imperial College in the United Kingdom, collaborated on the discovery.

Associate Professor Peter Lewis from the Faculty of Science and Information Technology at the University of Newcastle in Australia said until now, researchers had not fully understood how bacteria responded to stress and potential danger.

"It is important to understand the changes that occur when bacteria are under stress as this is the point at which they are likely to become most infectious.

"The protein molecules that make up the stressosome are found in a very wide range of bacteria. Some of these bacteria cause diseases such as listeriosis that has a 30 per cent mortality rate, and melioidosis that has a mortality rate as high as 90 per cent and is a significant health problem in northern Australia and south-east Asia.

"With bacteria becoming increasingly resistant to antibiotics, understanding how the stress response is controlled could lead to the development of drugs that help prevent bacterial infection from occurring."

Lead author of the Science paper, Professor Rick Lewis from Newcastle University in the United Kingdom, said the team used groundbreaking techniques to observe the stressosomes. Electron microscopy techniques were developed by Professor Marin van Heel of Imperial College and Associate Professor Peter Lewis developed the fluorescence microscopy imaging techniques.

"We knew that when bacteria were stressed, a warning signal would be sent from the surface to the inside of the cell. The stressosome would then respond by triggering new proteins in the cell to react to the stress.

"Our latest work has revealed the structure and number of stressosomes per cell. This has helped us understand how quickly the stressosomes respond to external stresses and prepare the cell to adapt to changes in its environment and ensure its survival."

Source: Research Australia

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