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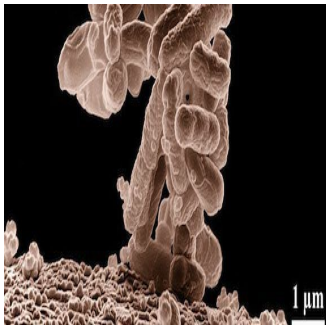
Stubborn Antibiotic-Resistant Bacteria Behaviour Revealed



Researchers at Hebrew University of Jerusalem have successfully been able to reveal the mechanism that allows some bacteria to avoid treatment with antibiotics.

This breakthrough could lead to new methods to control this type of bacteria.

It is known that bacteria are able to achieve resistance to antibiotics via mutation, however there are further types of bacteria labeled ‘persistent bacteria’. Not actually resistant to antibiotic treatment, they present a medical challenge as they manage to survive by entering an inactive or dormant state while exposed to the antibiotic, only to reactivate once the treatment has ended and to resume their bacterial activity.

While scientists have been aware of a connection between these types of bacteria and the naturally occurring toxin HipA within them, research had so far not identified the cellular target of HipA and the method it uses to achieve the bacteria’s dormant behaviour.

Led by Prof. Gadi Glaser of the Faculty of Medicine and Prof. Nathalie Balaban of the Racah Institute of Physics, the Hebrew University researchers have now been successful in unveiling the process.

When attacked by antibiotics, the HipA toxin present in the bacteria interrupts the chemical messaging process necessary for nutrients to build proteins. Research showed that the bacteria interprets this as a ‘hunger signal’, sending them into an inactive dormant state and thus allowing them to survive for the duration of the antibacterial treatment and enabling them to resume their harmful activity thereafter.

Conducted in Prof. Balaban's lab for several years, this research on persistent bacteria has been focusing on the development of a biophysical understanding of the phenomenon. With the objective of finding more effective treatment methods to combat bacterial infections, this research will be combined with other work being done in the same laboratory geared towards persistent bacteria.

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