

CCMB SCIENTISTS DISCOVER NEW ENZYME FOR CELL STABILITY

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Centre for Cellular and Molecular Biology

The Centre for Cellular and Molecular Biology (CCMB) scientists here have discovered an enzyme that helps maintain the stability and integrity of cell walls in bacteria such as *Escherichia coli*.

Named 'LdtF', the enzyme plays a vital role in the formation of covalent linkages between the bacterial outer membrane and an inner polymer layer that protects bacteria from environmental stress. This study will help understand the fundamental bacterial cell wall biology and identify alternate drug targets for the development of new antimicrobials.

Cell wall of gram-negative bacteria has an outer membrane and an inner membrane. Sandwiched between these two membranes is a layer of 'peptidoglycan', a polymer of amino acids and sugars that form a protective layer. A lipoprotein is known to link the outer membrane to the layer of peptidoglycan. But, how the linkages between the lipoprotein and peptidoglycan are modified is not known.

CCMB scientists led by Manjula Reddy studied the cell wall biology of a well-studied strain of *E. coli* using genetic and biochemical approaches to identify 'LdtF' which could cleave the lipoprotein from the peptidoglycan. Absence of this LdtF enhanced growth defects and increased the peptidoglycan-lipoprotein linkages in the bacteria.

The presence of this enzyme, however, decreased the levels of peptidoglycan-bound lipoprotein, suggesting its role in modulating the peptidoglycan-lipoprotein linkages. Such LdtF-mediated modulation of the cell wall gives bacteria flexibility and a survival advantage in fluctuating environmental conditions, said Dr. Reddy. The research finding has been featured in the latest Nature India magazine.

LdtF-mediated modulation of the cell wall gives bacteria flexibility and a survival advantage in fluctuating environmental conditions.

Manjula Reddy,

Scientist.

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