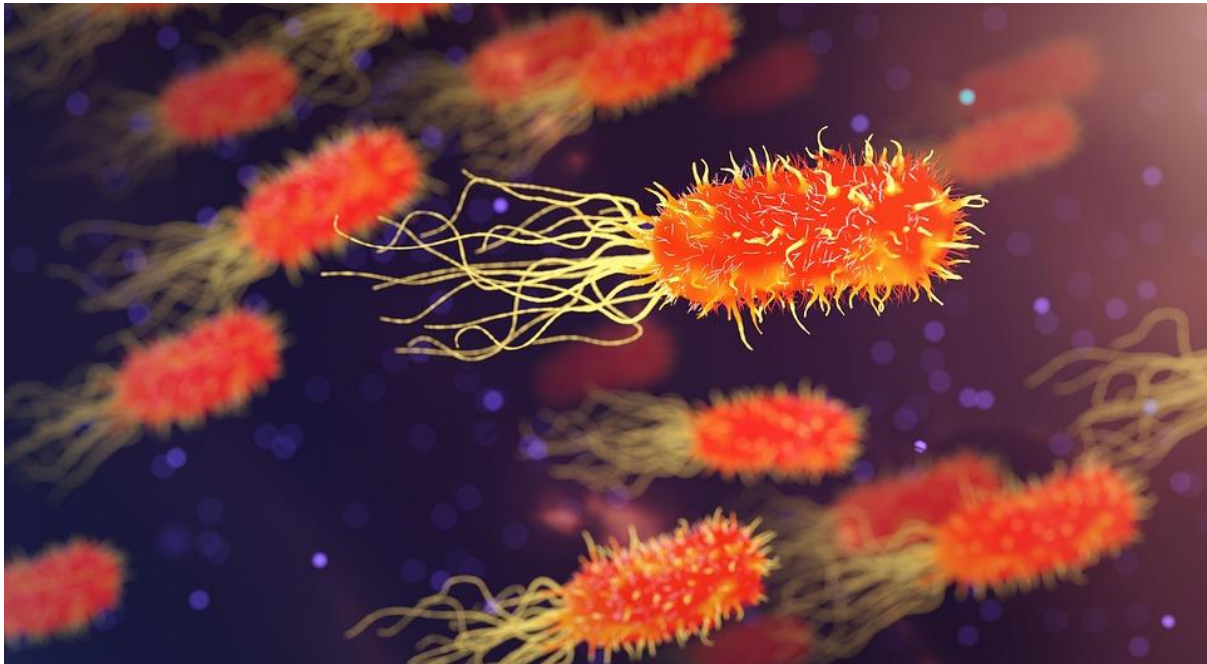


DBT-CDFD researchers gain deeper molecular insight into the working of bacteria



New Delhi, July 07: The modified guanosine nucleotides ppGpp and pppGpp, collectively referred as (p)ppGpp are synthesized across bacteria and are involved in the regulation of multiple functions including virulence in pathogenic bacteria.

The physiological functions modulated by (p)ppGpp, referred to as stringent response, has been the subject of investigation for more than four decades, with the majority of the work carried out using the bacterial model organism, *Escherichia coli*.

These studies have revealed that the changes in the (p)ppGpp pool is broadly associated with growth retardation and alterations in gene expression that vary with the intracellular concentration of (p)ppGpp. The physiological significance of altered expression has not been addressed for a large number of the genes regulated by (p)ppGpp. Studying the phenotypes unique to the strain lacking (p)ppGpp (ppGpp⁰) in unstressed growth conditions can be useful to understand functions regulated by basal levels of (p)ppGpp.

A team of researchers at the Department of Biotechnology's Centre for DNA Fingerprinting and Diagnostics (DBT-CDFD) have uncovered a function modulated by basal levels of (p)ppGpp by screening for genes that confer synthetic lethality (two non-essential gene mutations conferring lethality when present together) in the absence of (p)ppGpp. The results show that basal (p)ppGpp and Lon protease contribute to the robustness of the cell division machinery in *E. coli* under the fast growth conditions. Since biological processes and

molecules are conserved across life forms, findings made in model bacterium such as *Escherichia coli* may be extrapolated to other bacterium, including pathogens.

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