

Scientist at CDFD discovered novel *fabY* gene responsible for fatty acid synthesis in the bacterium *Escherichia coli*

By Dr Bilqeesa Bhat

Cells that make up living organisms are surrounded by a membrane made up of lipids. The lipids are made from fatty acids which are synthesized in the cell. While all organisms have the lipid membrane, the composition of the lipids and fatty acids vary between organisms and different cells within an organism. In bacteria, the fatty acids that make up the lipid membrane have a carbon chain length of 16 or 18. These long chain fatty acids are synthesized starting from the 2 carbon molecule, Acetyl-CoA (initiation) and the chain length is then extended by two carbon units at a time (elongation).

A study carried out at Hyderabad based research institute, Center for DNA Fingerprinting and Diagnostics (CDFD) discovered a novel gene bacterium *Escherichia coli* designated as FabY responsible for supports initiation of fatty acid biosynthesis. Previously reported enzyme which catalyzed the initiation of fatty acid synthesis was called as called FabH.

Evidence obtained in this study indicates that expression of *fabY* gene is dependent on the modification of nucleotides ppGpp and pppGpp. These two molecules found in all bacteria are synthesized from one of the four nucleotides (GTP) that is used for DNA synthesis. The molecules ppGpp and pppGpp are present at low level when the bacteria are dividing fast and its levels increases during different kinds of stress that usually slow down the growth of the bacteria. The mechanism by which *fabY* expression is regulated by the modified nucleotides is currently under investigation. Many biological processes and molecules are conserved across life forms. So findings made in model bacterium such as *E. coli* can have implications in other bacterium, including pathogens.

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