

SCIENCE

IIT Gandhinagar: A new molecule to target H. pylori synthesised



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MARCH 02, 2019 12:29 IST

UPDATED: MARCH 02, 2019 12:31 IST

An indole-based compound could inhibit bacterial enzyme selectively

The bacterium *Helicobacter pylori* which has been recognised as a type 1 carcinogen, is one of the major infection-causing organisms. Scientists have been working to find new compounds that can specifically target the bacteria. Researchers from IIT Gandhinagar have now designed a compound using indole as a building material that can do the job.

Key enzyme targeted

The indole-based compound was found to target an important bacterial enzyme (Hp IMPDH) that is essential for microbial proliferation. “We synthesised over a set of 25 molecules and

tested their activity. The indole-based compound was able to bind to the enzyme very potently and inhibit its function,” explains Sivapriya Kirubakaran from the Department of Chemistry and corresponding author of the work published in *Scientific Reports*. The team is working to make high throughput library of small molecules. This library will be highly useful to screen against various targets that are important in several infectious diseases.

Dr. Kirubakaran explained that unlike the currently used benzimidazole compounds that were metabolically unstable, indole-based compound proved to be stable. By making simple chemical changes to the commercially available indole, they were able to create the compound that can inhibit the bacterial enzyme selectively over human enzyme.

The targeted *H. pylori* enzyme was expressed in *E. coli* and studied. “A detailed enzyme kinetic analysis showed that about 75% inhibition of the enzyme is brought about by the new compound,” adds Vijay Thiruvengatam from the department of Biological Engineering and one of the authors of the paper. “More studies on *H. pylori*-infected cell lines are needed to validate the results.”

“This work is a starting point towards targeted therapy for many infections as the IMPDH enzyme is a potential target in many pathogens like *Mycobacterium*, *Streptococcus pneumoniae*,” adds Kapil Juvale, first author of the paper.

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