



## Molecular Framework for Superbugs

Researchers at the Indian Institute of Technology (IIT) Kanpur and the Lucknow-based Central Drug Research Institute (CDRI) have designed a **novel molecular framework** that would help drugs latch on to the germs and thus prevent them from multiplying.

- It's structure is such that it **stops energy production in the bacteria** for 20 minutes thus preventing it from multiplying.
- The new molecule **targets gyrase B**.
  - A substance called gyrase is essential for bacteria's survival and multiplication.
  - In most organisms, there are two types of gyrases — gyrase A and gyrase B.
  - Almost all of antibacterial drugs in use currently work by targeting gyrase A. The bugs modify gyrase A in such a way that the drugs fail to bind to them.
  - Gyrase B is more conserved in organisms and hence difficult to mutate.
- The new molecule when used in combination with fluoroquinolone drugs, the first line of antibiotic drugs, both gyrase A and gyrase B are attacked, making them more effective. This makes it possible to **destroy the bacteria** with the **same class of drugs** to which they have **developed resistance**.
- The framework is still in a proof-of-concept stage but the scientists have found it to be effective in lab-grown bacterial cells.
- Scientists have also found that the bacteria do not develop resistance to the new molecule that easily.
- This development has come at a time when there is a fear that the **multidrug-resistant superbugs** may kill as many as 10 million people worldwide by the year 2050.

### Note:

- The scientists used **staphylococcus aureus** bacteria frequently found in the nostrils, upper respiratory tract and on the skin of nearly 30% of people for developing the framework.
- While this bacteria is innocuous in healthy people, in those with low immunity levels, it causes many infections, some of them lethal. Over the years, it has become resistant to most drugs that are commonly used in clinics.
- **CDRI** is a constituent laboratory of the **Council of Scientific and Industrial Research (CSIR)**, Ministry of Science & Technology.

**Source:** [HBL](#)