Gene mapping of 3,000 bacteria to help fight deadly superbugs

Disease control: Researchers can use the database to develop new diagnostic tests, vaccines. | Photo Credit: Special Arrangement

Scientists seeking new ways to fight drug-resistant superbugs have mapped the genomes of more than 3,000 bacteria, including samples of a bug taken from Alexander Fleming's nose and a dysentery-causing strain from a First World War soldier.

The DNA of deadly strains of plague, dysentery and cholera were also decoded in what the researchers said was an effort to better understand some of the world's most dangerous diseases and develop new ways to fight them.

New antibiotics

The samples from Fleming — the British scientist credited with discovering the first antibiotic, penicillin, in 1928 — were among more than 5,500 bugs at Britain's National Collection of Type Cultures (NCTC).

The first bacteria to be deposited in the NCTC was a strain of dysentery-causing Shigella flexneri that was isolated in 1915 from a soldier in the trenches of First World War. "Knowing very accurately what bacteria looked like before and during the introduction of antibiotics and vaccines, and comparing them to current strains, ... shows us how they have responded to these treatments," said Julian Parkhill of Britain's Wellcome Sanger Institute who co-led the research. "This in turn helps us develop new antibiotics and vaccines."

Specialists estimate that around 70% of bacteria are already resistant to at least one antibiotic that is commonly used to treat them. This has made the evolution of "superbugs" that can evade one or multiple drugs one of the biggest threats facing medicine today.

Among the most serious risks are tuberculosis — which infects more than 10.4 million people a year and killed 1.7 million in 2016 alone — and gonorrhoea, a sexually transmitted disease that infects 78 million people a year and which the WHO says is becoming almost untreatable. The genomic maps of the 3,000 strains are to be published on the NCTC's website and made freely available to researchers worldwide to help them in the development of potential new diagnostic tests, vaccines or treatments.

The quadrivalent vaccine will have two A virus strains — H1N1 and H3N2 — and two B virus strains — Victoria and Yamagata

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