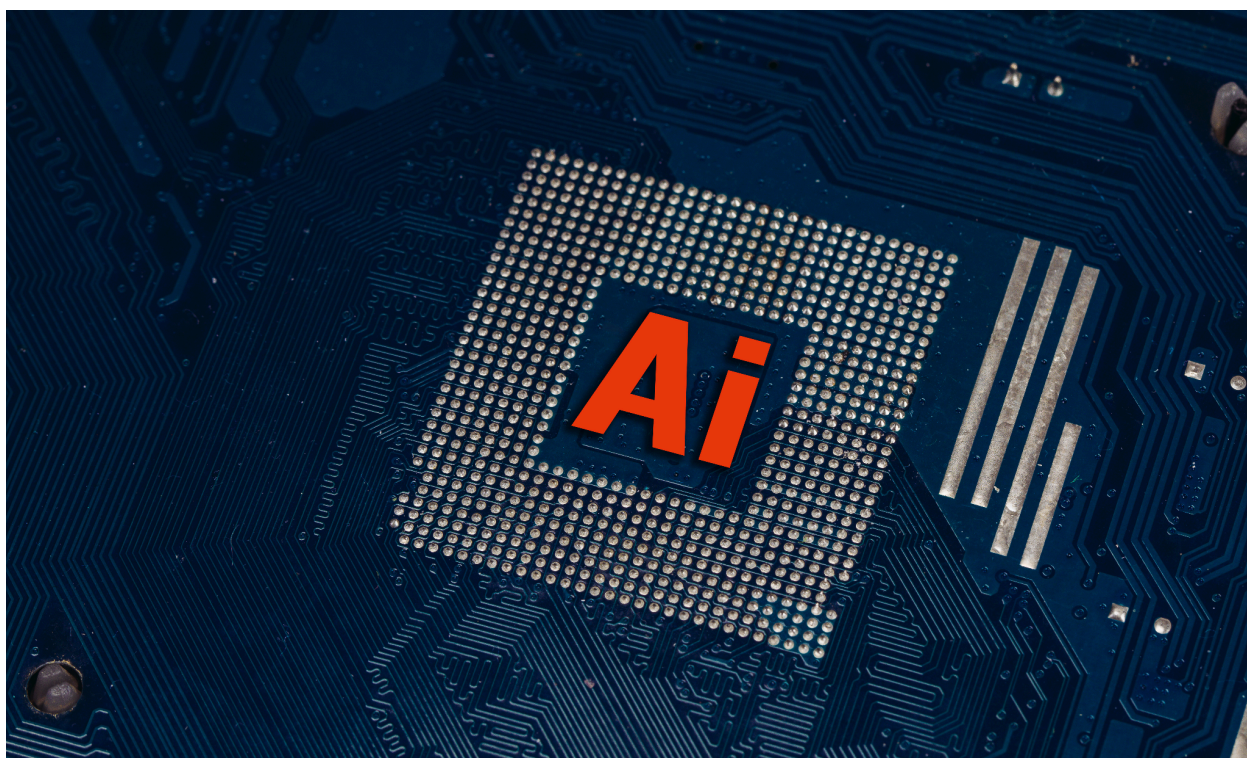


AI Assists Researchers in Synthesizing Safer Antibiotics



by [Arjun Desai](#) on August 28

The applications of AI are seemingly endless, growing more vast with every day, and it has now made its way into the world of pharmaceuticals. Recently at the University of Texas at Austin, scientists have used the power of AI to turn a previously harmful antibiotic, to a helpful one.

Scientists at the University have applied large language models to pharmaceutical research, which were previously used to generate sequences of text. Due to the nature of proteins, they are structured like sentences but, rather than words, they are created using amino acid chains.

Using AI, the team of scientists were able to pinpoint exact areas of the antibiotic, Protegrin-1, that they were attempting to reengineer. Though it is naturally found in pigs, Protegrin-1 is effective in fighting and killing bacteria in the human body, while still being toxic. Protegrin-1 is a part of a group of antibiotics, known as antimicrobial peptides. These antibiotics are known to work by disrupting the cell membrane of the targeted bacteria, but often disrupt the human cell membrane as well.

At first, researchers utilized a high-throughput method that they had previously developed to create over 7000 different variations of Protegrin-1 to display the changeable areas without losing its antibiotic properties. After they trained an LLM based on these findings, it generated millions of different variations based on three key factors: targeting bacterial membranes selectively, killing bacteria effectively, and not harming human red blood cells. With all of these new findings, a new more selective antibiotic called Protegrin-1.2 was created.

Currently, the new antibiotic is being put through the animal testing phase. When compared with those who were not treated, mice that have experienced Protegrin-1.2 were much less likely to have detectable amounts of bacteria six hours after being infected. If the rest of the animal trials yield positive results, this group of researchers are excited to bring an AI-informed antibiotic into human trials.

Journal References:

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