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AI Innovation Brings New Hope in Global Fight Against Snakebites

July 30, 2025

Categories: Breaking News

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Scientists in Denmark are leading a remarkable leap forward in global health by developing artificial intelligence (AI)-driven antivenoms, a breakthrough with the potential to save countless lives. With snakebites affecting over five million people annually and

causing over 100,000 deaths worldwide, this innovation could mark the beginning of a new era in emergency medical treatment.

At the forefront of this research is the Technical University of Denmark (DTU), where a team led by Timothy Patrick Jenkins is harnessing the precision of AI to study and neutralise snake venom toxins. The existing antivenoms, largely based on decades-old methods, are often costly, species-specific, and difficult to produce or store in remote regions. The team's use of AI introduces a more efficient and potentially cost-effective solution, capable of offering broader protection.

Using advanced modelling, AI is being employed to decode the molecular structure of venom, particularly the "three-finger toxins" found in some of the world's most dangerous snakes. These toxins attack muscle and nerve function, often leading to paralysis or death. The researchers aim to design synthetic proteins that can neutralise these effects with greater accuracy than conventional treatments.

"This is a game-changer," Jenkins told Reuters, in a feature released on 29 July 2025. "We can now anticipate venom behaviours and design more effective countermeasures faster and more affordably."

A critical benefit of this approach lies in the development of *broad-spectrum* antivenoms, products effective against multiple snake species. This is especially important in rural and tropical areas, where identifying the snake species is often impossible and access to specific antivenoms is limited.

The World Health Organisation (WHO), which classifies snakebite envenoming as a neglected tropical disease, supports this initiative. The WHO estimates between 81,000 and 138,000 snakebite deaths annually, with around 400,000 victims left permanently disabled. It hopes AI-designed treatments can be integrated into national health frameworks to reduce this toll.

Challenges remain, including regulatory approvals and ensuring fair distribution to low-income nations. However, the momentum behind the project, and the lives it may

ultimately save, underscores the value of combining technology with a humanitarian focus.

This pioneering work by DTU stands as a powerful example of what innovation can achieve when aimed at solving urgent, global problems, especially those that have long been overlooked.