

Development of a universal snake antivenom

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Snakebite is a global problem affecting more than 5 million people annually. It is estimated by the World Health Organization that approximately 200 to 300 people die every single day from venomous snakebite. Antivenom is often unavailable or unaffordable to those who need it most in sub-Saharan Africa, South Asia, and Southeast Asia where most of the world's population lives. Our research was sparked to address the needs of this neglected tropical disease by developing a novel antivenom that is fast and inexpensive to manufacture, and that has wide-efficacy against various snake venoms.

Our research began by investigating how various species of reptiles and mammals can safely hunt and eat venomous snakes, even when the risk of becoming envenomated is high and occurs. These venom-resistant animals create neutralizing antibodies and proteins that are expressed in their plasma. We harvest these proteins from the plasma of venom-resistant snakes and use them to make antivenom. We conducted a two-year clinical trial in dogs naturally envenomated by rattlesnakes in southern California. Our data suggest that the antivenom is both safe and efficacious. To continue our investigation, we are building a laboratory in South Africa where we intend to evaluate safety and efficacy in animals envenomated by native African venomous snakes. Ultimately, we hope to progress towards clinical trials in humans who have been envenomated.

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