

NEWS FROM THE PIT

Arizona Poison and Drug Information Center



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Don't Try This at Home

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It's not often that my mom asks me about updates in antivenom. So, I was surprised the other day when she wondered what I thought about the amazing new breakthrough in snake antivenom because a guy was bitten by snakes over 200 times and injected himself with venom. I hadn't heard about it. Have I been living, like a rattlesnake, under a rock?

A quick search found several related articles in major media outlets like the New York Times, BBC, and NPR. I also read the research paper published in the journal Cell by Jacob Glanville and others from the San Francisco Based biotech company Centivax. It's a wild story, but I don't expect radical changes in how we take care of snake bites at the Arizona Poison and Drug Information Center any time soon.

NEWSLETTER HIGHLIGHTS

Can self-inflicted snakebites lead to venom immunity?

Image 1: Monocled Cobra

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The researchers extracted two antibodies from the blood of Tim Friede, a self-taught snake enthusiast who, after nearly dying from self-inflicted bites from two cobras, went on an 18 year mission to develop immunity to snake venom. His endeavor included direct bites from his pet snakes as well as a program of injecting himself with extracted venom. You can find some compelling videos online of Friede presenting his arm directly to the mouths of a variety of deadly snakes. The researchers extracted two antibodies from Friede's blood with potential for binding and neutralizing snake venom. They combined these two antibodies with Varespladib, an experimental drug which inhibits phospholipase A2 toxins found in many snake venoms. Incidentally, our group ran one of the study sites for clinical trials of Varespladib in humans. The antibodies + Varespladib cocktail was able to prevent mice from dying when injected with elapid venom.

Despite the excitement surrounding the Cell study, it's good to understand its limitations and the long road ahead before these findings translate into tangible changes in clinical practice, particularly for us in Arizona.

- Elapids vs. Vipers: There are two main types of venomous snakes, Elapids and Vipers. This research focuses specifically on elapids, a family that includes cobras, mambas, and kraits. In Arizona, however, the concern is envenomation by rattlesnakes, which are vipers. The only elapid of concern in the USA is the coral snake. In Arizona, we have the Sonoran coral snake, but bites are extraordinarily rare and those that do occur are rarely of medical significance.
- Early-Stage Research: This is research conducted in mice. While promising, this isn't a cure for humans and there are many scientific, logistical, and economic hurdles along the way to saving human lives. Early science is like all those adorable baby turtles rushing to the water line; unfortunately, only a fraction will make it to maturity. Not to be a buzzkill, but when you read a newspaper headline that say's ABC might do XYZ, it's a good idea to also try saying ABC might not do XYZ.
- Hype: This early-stage research might not be getting popular press attention if it didn't involve extracting antibodies from the blood of a colorful character with an unusual personal story. Additionally, some of the coverage overstated the novelty of this strategy. You might get the impression that universal antivenom was entirely different from how we currently treat snakebites and that currently we need to identify individual species to select the proper antivenom to match. However, this is not the case with rattlesnakes in Arizona or anywhere in the USA. All North American Pit vipers from the Mojave to the Water Moccasin can be treated with either of two FDA approved antibody-based medications; Crofab or Anavip.

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Image 2: Arizona Coral Snake

A final issue to touch on is how we understand the contributions of Mr. Friede. In her article in *Nature*, author Katherine Bourzac notes that “reliance on material from a person who performed dangerous experiments on himself makes it ethically murky.” She goes on to quote the paper’s co-author Jacob Glanville saying, “We did not advise Friede to do this and no one else needs to do this again — we have all the molecules we need.”

I think it’s great that this news cycle highlighted the need for snakebite care as a global health problem and I’m excited about developments in antibody technology. But I also think we should remain cautious of “don’t try this at home” high-risk self-experimentation. We at AZPDIC will continue to keep an eye on the latest developments in the prevention and treatment of snakebites with a celebration of both innovation and safety.



Image 3: Western Diamondback Rattlesnake