Drug discovery biologist Steve Trim spent 10 years at the pharmaceutical giant Pfizer, and one of his roles was as the safety officer for the venoms he and his colleagues worked with. After being laid off in 2010, Trim decided to combine his professional training with his personal interest in spiders and snakes and started his own firm, Venomtech. The UK-based company, where Trim now serves as the chief scientific officer, focuses on hunting for new drugs in the venoms of poisonous animals. Dalmeet Singh Chawla spoke with Trim about how making libraries of venom peptides can help with this endeavor. This interview has been edited for length and clarity.

Why did you create a company focused entirely on venom research?

My research has focused on pain and neuroscience, and the problem of drugs being nonspecific or having poor specificity and therefore many side effects. The drug interaction surface in ion channels, which are involved in pain, is quite large; that makes it difficult for the channels to interact with small molecules.

One of the ways around this seems to be to use venom peptides because they have a large interaction surface and have evolved to interact with ion channels. It’s a great way of immobilizing your prey by generating pain signals in them.

The evolutionary benefit of venom peptides interacting with these particular targets led me into thinking about how we can make a druglike molecule from a venom peptide. The human body synthesizes many peptides to kick off a signal and then breaks them down right away, but venom peptides are much more stable. I started Venomtech with...
the aim of solving the major drug discovery problem of getting venom peptides in a usable format.

As a private individual, I also keep nondangerous spiders and snakes. My animal room is now my office.

What distinguishes your company from other firms that work with venom?
We have a handful of competitors around the world. They’re producing large amounts of venom for antivenom production, which is really important work.

We’re not making treatments for bites. We’re drug discoverers. What we’re doing is separating the venom out into its component parts and building compound libraries for specific drug targets.

A lot of what we do is understanding the sequence of the venom peptides that have a particular action.

You can screen these sequences against your drug target to get different potencies and selectivities; then you can put all that data together to build a sequence–activity relationship. This will probably take you to a synthetic peptide that has all the druglike properties of the original venom peptide but in a smaller molecule.

We’ve got about 185 venomous species, and we put venoms from about 10% of those species in any given library designed for a particular drug target. That makes us very different from our competitors.

To generate data to help market the venoms and the compound libraries, we’re doing our own research to prove how venoms work in different targets and to discover new activities of animals.

Have venoms proved themselves to be useful as drugs?
There are drugs on the market that are actual venom proteins that come from rattlesnakes. There’s also exenatide (Byetta), a drug for type 2 diabetes, which is derived from a chemical found in the saliva of a venomous lizard called the Gila monster.

But it is not that the drugs are always from the venom themselves. For instance, captopril was the first antihypertensive. It owes its discovery to snake venom, but the actual drug is a small molecule mimic of the snake venom that binds in the same place the venom peptide usually binds.

What does Venomtech’s future look like to you?
In addition to creating compound libraries, in recent years, we’ve started doing more contract research. We’ve got customers who either don’t have the screening capacity themselves or space within their screening platforms. We end up providing them a data pack where we’ve done the end-to-end research in-house—collecting the venom, building the compound library, screening against the target, and providing the data to the customer.

We are involved in other markets as well. Although drug discovery is our core focus, we also do a lot of work in crop science, pest control, and cosmetics.

Dalmeet Singh Chawla is a freelance contributor to Chemical & Engineering News, an independent news outlet of the American Chemical Society.