

Lizard laboratory

## The 48 uses of dragon's blood

*Komodo dragons could be the source for a new generation of antibiotics*



MYTHOLOGY is rich with tales of dragons and the magical properties their innards possess. One of the most valuable bits was their blood. Supposedly capable of curing respiratory and digestive disorders, it was widely sought. A new study has provided a factual twist on these fictional medicines. Barney Bishop and Monique van Hoek, at George Mason University in Virginia, report in *The Journal of Proteome Research* that the blood of the Komodo dragon, the largest living lizard on the planet, is loaded with compounds that could be used as antibiotics.

Komodo dragons, which are native to parts of Indonesia, ambush large animals like water buffalo and deer with a bite to the throat. If their prey does not fall immediately, the dragons rarely continue the fight. Instead, they back away and let the mix of mild venom and dozens of pathogenic bacteria found in their saliva finish the job. They track their prey until it succumbs,

whereupon they can feast without a struggle. Intriguingly, though, Komodo dragons appear to be resistant to bites inflicted by other dragons.

Most animals—not just Komodo dragons—carry simple proteins known as antimicrobial peptides (AMPs) as general-purpose weapons against infection. But if the AMPs of Komodo dragons are potent enough to let them shrug off otherwise-fatal bites from their fellow animals, they are probably especially robust. And that could make them a promising source of chemicals upon which to base new antibiotics.

With that in mind, and working with the St Augustine Alligator Farm Zoological Park in Florida, Dr Bishop obtained fresh Komodo dragon blood. He examined the blood for peptides with molecular weights, lengths, electrical charges and chemical characteristics that were similar to those from known AMPs. He then analysed the peptides using a mass spectrometer and a combination of commercial and home-brewed software to identify which of the newly discovered peptides were likely to have medicinal potential.

The team identified 48 potential AMPs that had never been seen before. Their initial tests were equally promising. Dr Van Hoek exposed two species of pathogenic bacteria, *Pseudomonas aeruginosa* and *Staphylococcus aureus*, to eight of the most promising peptides they had identified. The growth of both species of bacteria was severely hampered by seven of the eight; the remaining peptide was effective against only *P. aeruginosa*.

These results are noteworthy. Antibiotic-proof bacteria are an increasing problem in hospitals. Such bugs are now thought to kill some 700,000 people each year around the world, and *P. aeruginosa* and *S. aureus* are parental strains for some of the most menacing types. On February 27th the World Health Organisation named both in its first-ever list of “priority pathogens”, for which drug-resistance is a serious problem. Dr Bishop’s findings hint that the blood of dragons may yet prove to be as useful against disease as myths suggest.