



increasingly turned to other sources, one of which are [peptides](#) (compounds consisting of two or more amino acids linked in a chain) found in many plants and animals, which have been shown to be effective in killing bacteria.

In this new research, the team shaved the skin off the backs of several test mice, cut the skin and then infected them with several different types of bacteria. Once the infections were raging, the team applied an ointment containing the peptide Kn2-7 which was a modified form of another peptide BmKn2 that had been extracted from [scorpion venom](#). After watching to see what would happen, the team found that the ointment killed a whole variety of bacteria allowing the wounds to heal naturally thereafter. Those infections in control groups on the other hand, continued to fester.

In looking closer to find out how the peptides killed the bacteria, the researchers found that it bound itself to their cell walls, coating them with microspheres, eventually causing them to burst. Unfortunately, they found that the natural peptide found in the scorpion venom tended to do the same thing to the host's red blood cells. To get around that problem, they modified the peptide in such a way as to keep its ability to coat bacteria cells, while lessening its tendency to do so with red blood cells. The end result might just be one of the new tools given to medical professionals in the near future to replace existing bacterial treatments.

**More information:** Cao L, Dai C, Li Z, Fan Z, Song Y, et al. (2012) Antibacterial Activity and Mechanism of a Scorpion Venom Peptide Derivative In Vitro and In Vivo. *PLoS ONE* 7(7): e40135.  
[doi:10.1371/journal.pone.0040135](https://doi.org/10.1371/journal.pone.0040135)

### **Abstract**

BmKn2 is an antimicrobial peptide (AMP) characterized from the venom of scorpion *Mesobuthus martensii* Karsch by our group. In this

study, Kn2-7 was derived from BmKn2 to improve the antibacterial activity and decrease hemolytic activity. Kn2-7 showed increased inhibitory activity against both Gram-positive bacteria and Gram-negative bacteria. Moreover, Kn2-7 exhibited higher antibacterial activity against clinical antibiotic-resistant strains such as methicillin-resistant *Staphylococcus aureus* (MRSA). In addition, the topical use of Kn2-7 effectively protected the skin of mice from infection in an *S. aureus* mouse skin infection model. Kn2-7 exerted its antibacterial activity via a bactericidal mechanism. Kn2-7 killed *S. aureus* and *E. coli* rapidly by binding to the lipoteichoic acid (LTA) in the *S. aureus* cell wall and the lipopolysaccharides (LPS) in the *E. coli* cell wall, respectively. Finally, the hemolytic activity of Kn2-7 was significantly decreased, compared to the wild-type peptide BmKn2. Taken together, the Kn2-7 peptide can be developed as a topical therapeutic agent for treating bacterial infections.

© 2012 Phys.org

Citation: Study finds scorpion venom able to heal bacterial infections in mice (2012, July 13) retrieved 20 September 2024 from <https://phys.org/news/2012-07-scorpion-venom-bacterial-infections-mice.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.