

Salamander skin peptide promotes quick and effective wound healing in mice

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Credit: Martha Sexton/public domain

Move over antibiotic ointment, there might be a new salve to dominate medicine cabinets of the future, and it comes from an unlikely place—the lowly salamander. Salamanders may not be the cuddliest of animals, but they can regenerate lost limbs and achieve amazing recovery of seriously damaged body parts. Now, a new report published in the

September 2014 issue of *The FASEB Journal*, identifies a small protein (called a "peptide") from the skin of salamanders that may be the key to unlocking the secret of this amazing wound healing trick in humans.

"This research takes a step toward an understanding of the cellular and molecular events that underlie quick [wound healing](#) in the salamander by the discovery of a potential wound healing promoting peptide," said Ren Lai, Ph.D., a researcher involved in the work from the Kunming Institute of Zoology at the Chinese Academy of Sciences in Yunnan, China.

To make this discovery, Lai and colleagues collected skin extract from salamanders and separated it by gel filtration and high performance liquid chromatography. The skin component from salamanders was subjected to keratinocyte cell proliferation and endothelial cell tube formation assay to evaluate possible wound healing potential. This component was further subjected to structure and functional analysis, which pointed toward a short peptide called tylotoxin that contained 12 amino acid residues. This peptide was found to exert the ability to promote wound healing with epidermal growth factor (EGF) in a murine model of a full thickness dermal wound. Tylotoxin directly enhances the motility and proliferation of keratinocytes, [vascular endothelial cells](#) and fibroblasts, resulting in accelerated re-epithelialization and granulation tissue formation in the wound site. Tylotoxin also promotes the release of transforming growth factor beta1 and interleukin 6, which are essential in the wound healing response.

"Until now, rapid wound healing has been the stuff of superheroes and science fiction," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "Scientists have always wondered how some 'lower' animals heal wounds that would be mortal to humans. Now, we are taking concrete steps to mimic this ancient – and forgotten – healing process in our own bodies."

More information: Lixian Mu, Jing Tang, Han Liu, Chuanbin Shen, Mingqiang Rong, Zhiye Zhang, and Ren Lai. A potential wound-healing-promoting peptide from salamander skin. *FASEB J.* September 2014 28:3919-3929; DOI: [10.1096/fj.13-248476](https://doi.org/10.1096/fj.13-248476)

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