Wound Healing, The Salamander Way

September 08, 2014


AsianScientist (Sep. 8, 2014) - 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. The report documenting these findings has been published in FASEB Journal.

Salamanders may not be the cuddliest of animals, but they can regenerate lost limbs and achieve amazing recovery of seriously damaged body parts. Now, scientists from the Chinese Academy of Sciences (CAS) have identified a small protein 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 Dr. Lai Ren, a researcher involved in the work from the Kunming Institute of Zoology at CAS 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 tylotoin that contained 12 amino acid residues.

The 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. Tylotoin 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. Tylotoin 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 Dr. Gerald Weissmann, 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."

The article can be found at: Mu et al. (2014) A Potential Wound-Healing-Promoting Peptide from Salamander Skin.
Source: Federation of American Societies for Experimental Biology; Photo: SATOSHI TOMIYAMA/Flickr/CC.
Disclaimer: This article does not necessarily reflect the views of AsianScientist or its staff.