

Unexpected helpers in wound healing

January 24 2018

Nerve cells in the skin help wounds to heal. When an injury occurs, cells known as glial cells change into repair cells and disseminate into the wound, where they help the skin to regenerate, researchers from the University of Zurich have shown.

An essential step in skin wound healing is wound closure, which is why shortly after an injury occurs, blood coagulates and seals the wound. For the injury to be able to heal permanently, however, the affected layers of the skin need to be newly formed. For that to happen, a complex, only partially understood interplay takes place between various cell types in our skin. Together with a team from ETH, Lukas Sommer, a professor in the Institute of Anatomy at the University of Zurich, and his research group have now been able to show that peripheral nerve cells play a central role in this healing process. The research group is part of "Skintegrity," a flagship project of the University Medicine Zurich initiative.

Glial cells change their identity

There have long been indications that for optimal healing to occur, a tissue needs to be innervated (i.e. supplied with nerves). The reason, however, remained unclear. With the help of an animal model, the researchers from Skintegrity discovered that fine nerve bundles change drastically if they are injured when a skin wound occurs. Cells along the injured nerve bundles, known as [glial cells](#), change their original identity and are reprogrammed to "[repair cells](#)." They thereby lose their contact to the nerve bundles and disseminate into the wound bed. "There, they

distribute a diverse cocktail of factors, which support the wound healing," explains Lukas Sommer. Through genetic experiments, he was able to prove that, among other things, these repair cells were important to help the wound close as they support the necessary reconstitution of the dermis.

Healing chronic wounds

In older people or people with diabetes, for example, [wounds](#) often heal slowly or, in some cases, not at all. Such [chronic wounds](#) usually cause serious health problems and treatment is currently unsatisfactory. Interestingly, the researchers from Skintegritiy also found reprogrammed peripheral nerve [cells](#) in human skin wounds. "Now we want to work together with clinicians from the University Hospital Zurich to better characterize the [wound healing](#) factors that are distributed by [nerve cells](#)," says Sommer. "This may lead to an effective treatment for chronic wounds in the future."

More information: Vadims Parfejevs et al. Injury-activated glial cells promote wound healing of the adult skin in mice, *Nature Communications* (2018). [DOI: 10.1038/s41467-017-01488-2](https://doi.org/10.1038/s41467-017-01488-2)

Provided by University of Zurich

Citation: Unexpected helpers in wound healing (2018, January 24) retrieved 18 April 2024 from <https://medicalxpress.com/news/2018-01-unexpected-helpers-wound.html>

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