

Mitochondria-targeted antioxidant SkQ1 helps to treat diabetic wounds

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Researchers at the Lomonosov Moscow State University used a mouse model of a mitochondria-targeted antioxidant to study treatment of diabetic wounds, and are publishing their results in the journal *Oxidative Medicine and Cellular Longevity*.

Wound [healing](#) is usually compromised in diabetes mellitus type II. Patients often suffer from skin damage on their feet—so-called [diabetic foot ulcers](#). These wounds are hard to treat, and commonly become chronic. At the moment, there are no efficient drugs for [diabetic wounds](#). Frequently, the only treatment option is a surgical procedure that is often ineffective. Diabetes is also accompanied by significant oxidative stress, affecting the vessels of diabetics. Scientists also assume that vessel dysfunction in diabetes, namely diabetic angiopathy, is one of the main reasons for delayed wound healing.

Dr. Roman Zinovkin, a senior researcher at the A.N. Belozersky Institute of Physico-Chemical Biology, a unit of the Lomonosov Moscow State University and a coauthor, reported, "In the current project, we've tested the mitochondria-targeted antioxidant SkQ1 on a [mouse model of diabetes mellitus type II](#). We've found that SkQ1 has significantly enhanced wound healing in these animals, namely, improved wound epithelization and granulation tissue formation. Additionally, it stimulated vascularization thus restoring disturbed blood circulation. The experiments on cell cultures, along with detailed histologic examination of these wounds, show that SkQ1 improves nearly all the major steps of wound healing. It proves that reactive oxygen species produced in

mitochondria play an important role in pathogenesis of diabetic [wounds](#)."

The scientists used a wide range of methods in their project including molecular biological techniques, and biochemical, immunological and histologic approaches.

The scientist concludes: "The current project is both scientifically and practically promising. It's very important to investigate the exact role of mitochondria and mitochondrial [reactive oxygen species](#) in all cell types responsible for diabetic wound healing. Practically, the obtained results could be used for the creation of an effective pharmaceutical drug for diabetic wound healing. This drug could be both in an oral form for systemic use and as a dermal wound dressing gel. We assume that the results, together with the data proving the safety of local use of SkQ1, may help to create an innovative pharmaceutical drug—namely, a wound-healing gel based on SkQ1 for diabetic wound treatment."

More information: Mitochondria-targeted antioxidant SkQ1 improves dermal wound healing in genetically diabetic mice. *Oxidative Medicine and Cellular Longevity*. www.hindawi.com/journals/omcl/aip/6408278/

Provided by Lomonosov Moscow State University

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