Sirt1 Gene Therapy For Improved Wound Healing

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Technology description

Short Description
Novel gene therapy delivered from a hydrogel wound dressing (NanonetsTM) augments Sirt1 expression to improve wound healing
Background
Chronic wounds such as non-healing diabetic foot ulcers are a great challenge for the physician and contribute to increasing healthcare costs. Others have attempted to improve chronic wound healing by autologous skin transplantation, tissue-engineered human skin equivalents, bone marrow derived cells or lineage commitment of stem cells to the keratinocyte lineage, and delivery of drugs. One currently marketed product delivers recombinant platelet derived growth factor to the wound bed, but it has significant side effects, including cancer.
Abstract
Northwestern scientists have dveloped a novel gene therapy to improve healing of chronic wounds, which combines Sirt1 expressing lentiviruses with a hydrogel wound dressing. Sirt1 is a histone deacetylase whose expression is decreased in the skin of diabetic mice and this phenomenon is thought to contribute to a slow wound healing phenotype. Prof. Ameer and colleagues have combined the NanonetsTM technology with Sirt1-expressing lentiviruses. This composite material was able to significantly improve wound healing in the diabetic mouse model over the course of 21 days, while also reducing inflammation and scarring. Expression of the Sirt1 transgene was sustained over 6 weeks, indicating that this invention has the potential to become a simpler and less labor-intensive alternative to current wound management protocols.

Application area

Diabetic foot ulcer treatment
Vascular graft improvement
Research reagent

Advantages

Inexpensive
Reduced scarring and inflammation

Institution

Northwestern University

Inventors

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