IMPROVED GENE TRANSFER AND WOUND HEALING
Tech ID: 19060 / UC Case 2001-078-0

FULL DESCRIPTION

Chronic non-healing wounds pose a serious health concern for the elderly, diabetics, immobilized individuals, and those with burns and inherited skin disorders. For example, of the 21 million diabetics in the US, approximately 15% are expected to develop a chronic wound in their lifetime, often leading to limb amputations. Currently, the cost of treating all types of chronic wounds is estimated to be over $7 billion per year in the US alone. However, with the expansion of diabetic and elderly populations in the coming years, demand for products to treat chronic wounds is expected to increase. Therefore, improving the healing of diabetic and other types of chronic wounds is a significant unmet medical need.

Description: Using a novel, methylcellulose-based delivery method, UCSF investigators discovered that Homeobox (Hox) transcription factor genes significantly improve healing of chronic wounds. A single application of one of three related Hox genes (Hox A3, Hox B3 and Hox D3) in plasmid form enhances closure of wounds in both diabetic mice and aged mice than would otherwise occur in the absence of treatment. Hox genes facilitate wound healing by increasing angiogenesis and promoting crucial extracellular matrix interactions (e.g. via upregulation of collagen). HoxA3 appears to be the most potent as it also accelerates healing by directly promoting re-epithelialization, or the migration of new skin cells into wounds.

FEATURES/BENEFITS

▶ Stable formulation
▶ Easy topical application
▶ Inexpensive to manufacture
▶ Could be used in combination with existing gene, protein, or cell therapies for wound healing
▶ Few side-effects anticipated due to the transient expression of plasmid DNA
▶ Can be used in protein or DNA form
▶ Gene therapy approach would circumvent some problems associated with peptide-based therapies such breakdown and denaturation of proteins at the wound site

APPLICATIONS

▶ Promote and accelerate wound healing in humans with chronic wounds

REFERENCES


PATENT STATUS

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