Serpin-based Polypeptide Compositions for Wound Healing

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Technology description

Wound healing, although complex, is a remarkably organized process involving hemostasis, inflammation, new tissue generation and remodeling. However, when wounds cover a large surface area, become infected, or occur in patients with impaired healing capacity, such as diabetics or the elderly, wound healing can be prolonged and result in chronic ulceration and further complications. New research is showing that moderating inflammation may alter the wound healing process through increased regeneration and decreased fibrosis. While there have been many wound management techniques and a few FDA approved therapeutics developed to promote healing, the failure rate is still high, necessitating the development of new and better treatments.

Researchers at the Biodesign Institute of Arizona State University have developed novel topical serine protease inhibitor (serpin) compositions to improve and accelerate wound healing. These compositions act as key regulators in the inflammatory cascade through urokinase-type plasminogen activators, plasmin, factor X and thrombin, making them ideal candidates for wound repair and regeneration. In a full-thickness wound model in mice, these compositions accelerated the time to wound closure by 2-5 days compared to saline alone.

These novel compositions represent a new class of immune-modulating, anti-inflammatory proteins that have the potential to improve wound healing outcomes and reduce associated morbidity and mortality.

Application area

- Wound healing
  - o Burn injuries
  - o Skin lacerations
  - o Diabetic, pressure, or venous ulcers
  - o Trauma wounds
  - o Routine or cosmetic surgeries
  - o Carcinoma related wounds
  - o Bedsores
  - o Atopic dermatitis

o Additional skin disorders

Advantages

• These compositions have minimal side effects
• Low levels of antibodies induced
• High potency – doses in the 100 µg/kg range
• Could improve outcome and reduce morbidity and mortality
• Easy topical application methods

Institution

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