



Health, Medicine and Biotechnology

Electroactive Material for Wound Healing

Wound healing facilitated by electrical activity

This technology is a device that uses electrical activity to facilitate the wound healing process while protecting the wound. The bandage is made of an electroactive material (pictured above) that is stimulated by the heat of the body and the pressure of cell growth, thus no external power source is required.

BENEFITS

- ➔ Speeds the wound healing process
- ➔ Combines active healing and wound protection into one
- ➔ Slim, self-contained alternative to electrical stimulation devices for accelerated wound healing
- ➔ Minimizes infection and related complications (e.g., illness, amputation)

APPLICATIONS

- ➔ Military personnel wounded in the field
- ➔ Hospital patients who have undergone surgery
- ➔ General patients who have suffered a serious wound
- ➔ Astronauts in space

technology solution



NASA Technology Transfer Program

Bringing NASA Technology Down to Earth

THE TECHNOLOGY

An electroactive device is applied to an external wound site. This method utilizes generated low level electrical stimulation to promote the wound healing process while simultaneously protecting it from infection. The material is fabricated from polyvinylidene fluoride, or PVDF, a thermoplastic fluoropolymer that is highly piezoelectric when poled. The fabrication method of the electroactive material is based on a previous Langley invention of an apparatus that is used to electrospin highly aligned polymer fiber material. A description of the fabrication method can be found in the technology opportunity announcement titled "NASA Langley's Highly Electrospun Fibers and Mats," which is available on NASA Langley's Technology Gateway.



PVDF scaffold close-up. Image credit: NASA



db/db mouse. Image credit: NASA

PUBLICATIONS

Patent Pending

National Aeronautics and Space Administration

The Technology Gateway

Langley Research Center

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