"Method for Crosslinking Nanofiber Scaffolds and Introducing Bioactive Molecules to Scaffolds" VCU #10-109

Applications

- Platform for delivery of therapeutics and antimicrobials during wound healing
- Provides a framework for tissue regeneration

Advantages

- Control for physical and biological properties of the scaffold
- Scaffolds maintain integrity and functional properties, despite manipulations
- Uses existing technologies and materials in a novel way
- Can be formed of composites of natural and synthetic biopolymers

Inventors

Hu Yang, Ph.D
Gary Bowlin, Ph.D
Alpana Dongargaonkar

Contact

Afsar Mir
Licensing Associate
miraq@vcu.edu
Direct 804-827-2213

Market Need

While electrospinning nanofiber scaffolds for potential applications in tissue engineering continues to be of interest, the lack of structural stability of these scaffolds has limited further development and practical application. Methods that support the manufacture of crosslinked nanofiber matrices with a wide range of physical and biological properties are needed to utilize electrospun nanofiber scaffolds for tissue engineering and wound healing.

Technology Summary

This is a unique method of crosslinking electrospun nanofiber scaffolds in such a way as to establish a matrix with a variety of attributes including being able to manipulate chemical, mechanical and biological properties. Scaffold characteristics, including morphology, fiber diameter, tensile strength, porosity, permeability and swelling ratios can be manipulated by changing the composition of the scaffold. This method can allow for the construction of a wide range scaffold compositions with the noninvasive introduction of bioactive molecules and therapeutics, including dendrimers, into the nanofiber scaffold so as not to compromise its structure or function.

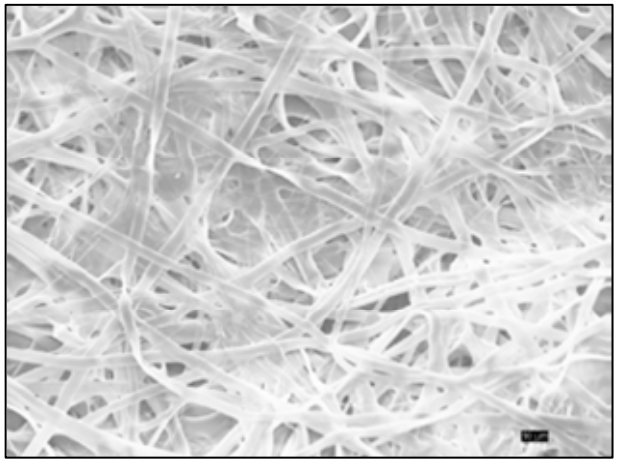

Figure 1SEM image of crosslinked gelatin nanofiber construct, which keeps individual nanofibers and possesses similar structure characteristics to non-cross-linked nanofiber construct. Scale bar: 10 µm.

Technology Status

Stable crosslinked electrospun nanofiber scaffolds have been created and studied under a variety of conditions. In vitro studies and antimicrobial assays indicate that this technology inhibits bacterial growth during wound healing.

Patent pending: U.S. and foreign rights are available

This technology is available for licensing to industry for further development and commercialization