

Applications

- Tissue and organ engineering
- Vascular Grafts
- Surgical Meshes
- Wound Care
- Hemostatic Bandages

Advantages

- Allows the use of non-volatile solvents
- Allows the use of various polymers with various properties
- Greater efficiency in creating electrospun structures
- Greater flexibility in creating structures with specific properties

Inventors

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Market Need

Electrospinning involves the flow of a polymer solution through a needle or capillary tube from a highly charged source, to a grounded target that draws the polymer solution across open space between the needle and target. Evaporation of the solvent from the solution during the transfer produces polymer fibers. Using this method, electrospun fibers can be used to make a wide range of different structures for various purposes. One of the prime disadvantages with this method is the polymer must be dissolved in highly volatile solvents. Otherwise, the solvent does not effectively evaporate during the transfer and it may arrive at the target as droplets, or just drip from the needle tip. Limiting the use of solvents to only highly-volatile solvents limits the use of types of polymers and thus obtaining specific material properties may not always be possible.

Technology Summary

Researchers at VCU have developed a novel method for the production of fibers for electrospinning that allows for efficient removal of residual solvent from the fiber. This technique provides an opportunity to effectively spin polymer solutions that use a very non-volatile solvent that would not be removed from the fiber under normal spinning conditions. In this process, two different variables can be controlled and with the appropriate choice of operating conditions, most polymer solutions can now be spun into solid polymeric fibers. This allows for greater flexibility in the type of polymer used and allows to create structures with very specific properties for very specific needs.

Technology Status

US Patent Issued: US7935298;

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