Researchers at the University of South Florida have developed polypeptide and organic polymer based nanofibers that can be used to produce materials for medicine and tissue engineering.

Over eight million surgical procedures are performed each year involving replacement organs or tissues. The cost of these procedures exceeds $400 billion annually, which indicates the great size the novel biomaterials market. In addition, the medical device industry tops $50 billion yearly in sales. More than 10 million Americans have at least one medical implant. These implanted medical devices are typically comprised of materials such as stainless steel, chromium, ceramics, industrial plastics, and metal alloys. These materials often elicit a foreign-body response at the implant site, because they are not recognized by the immune system. Thus, the implant may be rejected and require removal in order to protect the patient. This highlights the need for biocompatible and bio-absorbable materials to replace the traditional materials used to produce these products.

USF researchers have developed homogeneous nanofibers of pure synthetic polypeptides that may be used to construct medical implants. These novel biomaterials are absorbable, biodegradable, and they are less likely to provoke an immune response, making them advantageous for replacing traditional materials in medicine and tissue engineering. Possible applications of the technology include the production of better surgical sutures, wound dressings, tissue engineering scaffolds, medical textile materials and drug delivery depots.

ADVANTAGES:
- Biodegradable and absorbable
- Low risk of immune response
- High tensile strength
- Simple and versatile

USF Available Technologies

Polypeptide Electro-Spun Nano-Fibrils of Defined Composition

ADVANTAGES:
- Biodegradable and absorbable
- Low risk of immune response
- High tensile strength
- Simple and versatile

A Novel Biomaterial Made From Polypeptides and Electro-Spun Nano-Fibrils

Microscopic Image of the Electro-Spun Nano-Fibrils

850 x 30 kV 20µm

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