"Novel Device to Guide and Stimulate Nerve Regeneration" VCU #09-79

VIRGINIA COMMONWEALTH UNIVERSITY

Applications

- Directs and stimulates peripheral and central nerve regeneration
- Regulates nerve architecture
- Addresses complications associated with nerve injury (e.g.inflammation)

Advantages

- Mimics natural nerve structure
- Biodegradable
- Easy to manufacture
- Controlled release of drugs over time
- Concentration and composition of drugs can be tailored
- Regeneration is directed and predictable
- Reproducible manufacturing process
- Seamless

Inventors

David Simpson, Ph.D.
Gary Bowlin, Ph.D.
Raymond Colello, Ph.D.
B. Shekhar Jha
Woon Chow

Contact

Koffi Egbeto, M.S.
Licensing Associate
egbetok@vcu.edu
(804) 827-2213

Market Need

Hundreds of thousands of patients suffer from severed or torn nerves each year. In severe injuries, autologous grafts are the standard of care. Autologous grafts have many disadvantages including donor site morbidity, scarring, and motor loss. Nerve guides are expected to accelerate the regeneration process, and thereby reduce complications and improve the likelihood of functional recovery.

Technology Summary

This is a biodegradable guide that closely mimics the natural nerve. This guide provides two-prong approach to restore the structure and function of a damaged peripheral or central nerve.
First, the guide provides physical guidance cues. It has a seamless, cylindrical structure containing millions of parallel channels in which the nerve tissues can grow in a directed and predictable manner. This increases the likelihood of the nerve reattaching in the correct location.
Second, it contains chemical guidance cues. It has a precise, spatially regulated signal gradient to enhance nerve growth along the length of the implant. Reagents are embedded to address complications associated with nerve injury (e.g., scar tissue, inflammation). Moreover, these reagents can be coated to control their release over time.

Technology Status

U.S. patent pending: 13/394,415

Proof-of-concept studies: Rats treated with guides alone (i.e., sans signal gradient or embedded drugs) were functionally recovered 3-7 weeks sooner than without the guides. It is expected that addition of drugs will speed recovery. This is significant where days can make a difference in functional recovery. See publication: Acta Biomaterialia, 2010 Jul;6(7):2422-33.

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