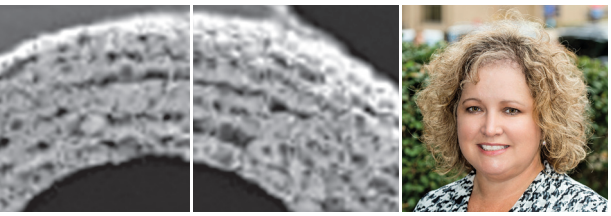
A Novel Conduit for Enhanced Nerve Repair



KACEY MARRA, PHD
University of Pittsburgh

"This technology has the potential to revolutionize treatment of long gap nerve repair."

https://www.mirm.pitt.edu/our-people/faculty-staff-bios/kacey-g-marra-phd

CLINICAL NEED

Injuries resulting in facial paralysis significantly affect a patient both physiologically and psychosocially. The standard of care for nerve injury requiring surgical repair is nerve autograft, which is suboptimal for various reasons. While several nerve guides are commercially available for regeneration of nerve gaps <3cm, those for use in large nerve gaps (>3cm) are not. Furthermore, despite the available interventions, current cases of nerve autografting or allografting result in insufficient functional recovery, where ~50% of patients are unable to return to pre-injury employment 1 year post-operation.

SOLUTION

Kacey Marra, PhD, and her team at the University of Pittsburgh have developed a novel conduit for long-gap nerve repair which consists of a degradable poly(caprolactone) nerve guide capable of controlled local delivery of drugs for nerve regeneration. Evaluation of the novel nerve guide in a 5cm median nerve defect model showed ~80% return to function after one year.

COMPETITIVE ADVANTAGE

Unlike decellularized technologies, our nerve guide elutes factors essential to nerve growth for several months, rendering it biologically similar to an autograft, the standard of care, without the need for a surgery to harvest the graft, thereby avoiding comorbidities associated with such procedures. The elimination of the harvesting procedure spares the patient from lifelong loss of sensation, as well as operating room time, saving an excess of 60 minutes per case.

ITP SUPPORT

With the ultimate goal of commercialization of our nerve guide for bridging craniofacial nerve defects, the work supported by the ITP program includes continued market validation and biocompatibility testing in support of a Q-submission to the FDA.

CLINICAL TRANSLATION PATHWAY

Publications:
Incorporation of double-walled microspheres into polymer nerve guides for the sustained delivery of glial cell line-derived neurotrophic factor. Biomaterials, 2010.

Sustained Growth Factor Delivery Promotes Axonal Regeneration in Long Gap Peripheral Nerve Repair. Tissue Eng Part A. 2011.

Intellectual Property:
US 9,498,221
Implantable medical devices having double walled microspheres.

Regulatory Pathway:
Anticipated: Device, 510(k), then IDE to enable PMA

Commercialization Strategy:
Technology licensed by Nerve Guide Technologies, Inc., a start-up company founded to advance our nerve guide

Product Launch Strategy:
In development with the MPWRM Commercialization/ Market Needs Core

Michigan-Pittsburgh-Wyss Regenerative Medicine Resource Center is supported in part by the National Institute of Dental & Craniofacial Research of the National Institutes of Health under Award Number U24DE026915. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.