UNIVERSITY OF WYOMING
Wyoming Technology Transfer and Research Products Center

Localized Immunosuppression of Peripheral Nerve Allografts

UW ID: 19-030

Inventors:
Jared Bushman

Patent Status:
Patent Pending

Description of Technology

When peripheral nerves (PNs) are bisected from injury or disease, a bridging device is placed into the gap in order to promote regeneration. Allografts of nerves harvested from donors—usually cadavers—work very well as bridging devices and strongly stimulate regeneration of the nerve. Unfortunately, this method is often not used due to the risks of systemic immunosuppressive therapy. Systemic immunosuppression is when the entire immune system of the patient is suppressed, a situation that puts patients at risk for pathogens, nephrotoxicity, and cancers. Immunosuppressive therapy is also very costly.

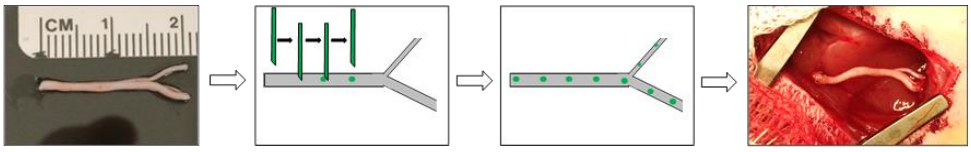
Researchers at the University of Wyoming have created a method to circumvent these risks and expenses by creating a method to localize the immunosuppressive therapy to the immediate area of the tissue graft. The result is a technology that would provide a substantial improvement in patient care within the field of PN repair. Immunosuppression is created by delivering immunosuppressive cell types only to the area of the allografted peripheral nerve by injecting the cells into tissue. The injected cells then provide immunosuppression against the graft by directly contacting and inhibiting immune cells or inhibiting immune cells via factors secreted by the injected cells. The cells could also be injected into the musculature in the vicinity of the nerve graft, but not actually onto the graft itself, which may equally provide localized immunosuppression.

Applications

PN regeneration is often the limiting component of a healthy recovery, and poor regeneration leads to functional motor impairment and alterations in sensory function, ranging from loss of sensation to allodynia (increased pain) and paresthesia (abnormal tingling or prickling). Hundreds of thousands of injuries to PNs occur each year in the US military and civilian population that require surgical intervention; therefore, the significant physical, psychological, and financial aspects of developing this technology to regenerate injured PNs cannot be overemphasized.

Features & Benefits

- Less risk involved than conventional methods that involve systematic immunosuppression
- Less costly than systematic immunosuppression
- Higher chance of the graft succeeding because there is less after-procedure care



1. Nerve graft is harvested from donor
2. Immunosuppressive cells are injected into the nerve graft
3. Nerve graft with pockets of injected immunosuppressive cells
4. Nerve graft containing cells is sutured into the recipient

Contact Us:
Wyoming Technology Transfer and Research Products Center
1000 E. University Ave
Laramie, WY 82071

Tele: 307-766-2520
Fax: 307-766-2530
Email: Wyominginvents@uwyo.edu