# Enzymatic Treatment to Increase Peripheral Nerve Regeneration

Published date: May 24, 2013

## Technology description

**Market Summary**

Peripheral nerve injury can occur in a variety of ways. They can be severed or crushed during traumatic injury, or degenerate as a symptom of progressive diseases such as diabetes. Loss of peripheral nerve function can lead to poor motor control of limbs and/or abnormal pain sensations. Currently only surgical intervention exists as a treatment for peripheral nerve injury. However, full recovery of function is often not achieved, even after this treatment. Therefore, adjunct or new treatments for peripheral nerve injury are needed.

**Technical Summary**

Axons in peripheral nerves are capable of regeneration, but restoration of normal function following peripheral nerve injury is poor. The principle growth inhibitory molecules in the distal stumps of injured peripheral nerves are members of three groups of proteoglycans distinguished by the composition of their glycosaminoglycan (GAG) side chains. Previous studies have shown that enzymes to dissolve GAGs containing chondroitin sulfate (CSPGs) increase nerve regeneration after injury, however this regeneration is incomplete suggesting other inhibitory molecules are involved. Emory researchers have developed a combination treatment of four enzymes to target the three groups of side chains, CSPGs, heparin sulfate polysaccharides (HSPGs), and keratin sulfate polymers (KSPGs). This enzyme cocktail has shown to stimulate regeneration at rates greater than the summation of the four enzymes used separately.

## Application area

Combination treatment of four enzymes to block nerve growth inhibitory molecules in peripheral nerve injury.

## Advantages

Enzymes degrade all three families of growth inhibiting molecules in peripheral nerve injury.
Combination treatment shows synergistic, not additive effect.

## Institution

Emory University

## Inventors

Robert Mckeon
Assoc Professor
SOM: Cell Biology
Arthur English
Professor
SOM: Cell Biology: Admin
Erica Werner
Assistant Professor
SOM: Rad Onc: Admin