

# TREATMENT FOR SPINAL CORD INJURY

**Invention:** Peptide enhancing the regeneration of neurites upon injury

**Indication:** Spinal cord injury and traumatic brain injury

**Project phase:** in vivo PoC for the lead compound, SEQ10 in US 9,896,488 exists



A spinal cord injury (SCI) damages any part of the spinal cord or nerves at the end of the spinal canal and often causes permanent changes in strength, sensation and other body functions below the site of the injury. In the US alone, there are an estimated 12,500 new cases of SCI each year, with approximately 260,000 individuals afflicted by SCI.

Recurring annual costs of caring for patients with chronic SCI is a large economic burden on health care system. Direct medical and disability support costs in the US alone are \$14.5 billion per year and the loss of productivity accounts for an additional \$5.5 billion annually. At present there are no known ways to reverse damage to the spinal cord. Our research has focused on extracellular matrix components that are relevant in plasticity and regeneration.

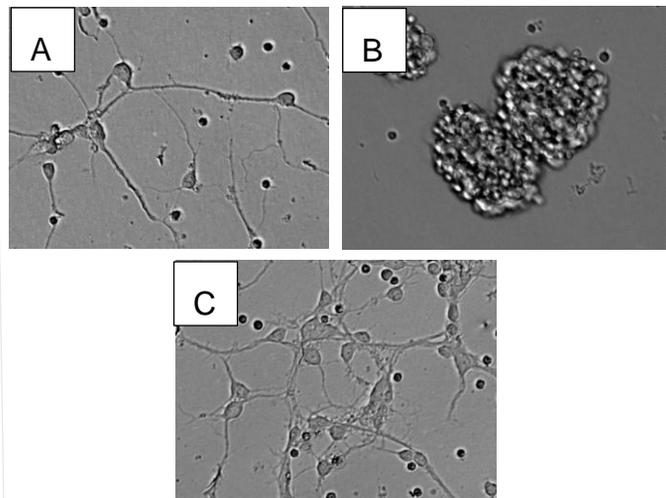
**Heikki Rauvala, Principal Investigator  
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## Overcoming limited regeneration capacity of the CNS

The limited degree of plasticity and regeneration in the adult CNS is reflected in failure to grow neurites (axons and dendrites) across the injured area, which causes a major medical problem in traumas of the spinal cord. The extracellular matrix of the CNS and its chondroitin sulfate proteoglycans (CSPGs) are currently regarded as major inhibitory regulators of plasticity and regeneration. We have demonstrated that certain CSPG-binding peptides can reverse the matrix from inhibition to activation of regeneration. Our invention offers a novel therapeutic approach to treat chronic SCI patients.

## Available data and next steps

- PoC in hemisection and contusion injury models of SCI
- Current lead selected based on in vitro and in vivo potency as well as safety and toxicity profile
- Therapeutic time window and dose-response studies are ongoing.
- Project has won prestigious Wings for Life funding to support further preclinical studies.



*Invented peptides transform CSPG-rich matrix into potent activator of neurite growth. A. Cortical neurons plated on a control well. B. Cortical neurons plated on a well coated with aggrecan (a CSPG). C. Cortical neurons growing on a plate coated with aggrecan in the presence of CSPG-binding peptide*

## Key Publications

- Rauvala et al. Inhibition and enhancement of neural regeneration by chondroitin sulfate proteoglycans. *Neural Regen Res* (2017)
- Paveliev et al. HB-GAM (pleiotrophin) reverses inhibition of neural regeneration by the CNS extracellular matrix. *Sci Rep* (2016)

## Patents

- US granted patent (US 9,896,488)
- EPO patent application is pending

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