



CONTACT: [ipm@innovatecalgary.com](mailto:ipm@innovatecalgary.com) • 403.284.6400

## Therapeutic application of alphaB-crystallin promotes recovery from peripheral nerve injury

TECH ID #: 1135.2

### Background

Damage to peripheral nerves often lead to dysfunction of hands, arms and legs because nerve fibers do not regrow completely in humans. Despite being a common injury, current treatment options rely on surgical anastomosis or nerve engraftment often leading to non-optimal outcomes. Moreover, adequate time for a surgery is often missed as surgical treatment decisions are made later after an initial diagnosis of the injury. An effective treatment option is needed for peripheral nerve injury as delayed surgical repair can result in only partial nerve regeneration.

AlphaB-crystallin (HSPB5/CRYAB/ $\alpha$ BC) is a small heat shock protein that enhances survival in response to stress by inhibiting protein aggregation, reducing levels of intracellular reactive oxygen species and inhibiting programmed cell death.  $\alpha$ BC is constitutively expressed by the peripheral nervous system (PNS) axons and Schwann cells. The inventors discovered that loss of the crystallin impaired conduction velocity as well as motor and sensory functions were likely related to deficits in remyelination. Intravenous injections of recombinant human  $\alpha$ BC promoted remyelination and functional recovery in wild-type mice following a sciatic nerve crush injury revealing a therapeutic effect of  $\alpha$ BC.

### Areas of Application

Therapeutic treatment for peripheral nerve damage.

Therapeutic could be administered:

- immediately post-injury
- at time of surgery
- intravenously
- at site of injury using  $\alpha$ BC-infused biodegradable gels or nerve connectors

### Competitive Advantages

There are currently no therapeutic treatments for peripheral nerve injury. Current standard of care is surgical treatment which does not solve the issue of incomplete regeneration of damaged PNS axons in humans.

The use of  $\alpha$ BC has been proven to be safe in humans.

# TECHNOLOGY



## Stage of Development

Pre-clinical data from mouse demonstrating a therapeutic effect of  $\alpha$ BC following a sciatic nerve crush injury. Phase 1 and 2a trials in multiple sclerosis patients demonstrate that alphaB-crystallin is safe in humans<sup>1</sup>.

## Intellectual Property Status

Patent pending

## Publications

Lim EF, *et al.*, 2017. AlphaB-crystallin regulates remyelination after peripheral nerve injury. *Proc Natl Acad Sci*; doi: 10.1073/pnas.1612136114.

---

<sup>1</sup> van Noort JM, Bsibi M, Nacken PJ, Verbeek R and Venneker EH. 2015. Therapeutic Intervention in Multiple Sclerosis with Alpha B-Crystallin: A Randomized Controlled Phase IIa Trial. *PLoS One*. 10(11):e0143366. doi: 10.1371/journal.pone.0143366.