Co-delivery of IL-10 and NT-3 to enhance spinal cord injury repair

17 April 2020

Credit: Mary Ann Liebert, Inc., publishers

Spinal cord injury (SCI) creates a complex microenvironment that is not conducive to repair; growth factors are in short supply, whereas factors that inhibit regeneration are plentiful. In a new report, researchers have developed a structural bridge material that simultaneously stimulates IL-10 and NT-3 expression using a single bi-cistronic vector to alter the microenvironment and enhance repair. The article is reported in *Tissue Engineering*.

In "Polycistronic Delivery of IL-10 and NT-3 Promotes Oligodendrocyte Myelination and Functional Recovery in a Mouse Spinal Cord Injury Model," Lonnie D. Shea, Ph.D., University of Michigan, and coauthors report the development of a new poly(lactide-co-glycolide) (PLG) bridge with an incorporated polycistronic IL-3/NT-3 lentiviral construct. This material was used to stimulate repair in a mouse SCI model. IL-10 was included to successfully stimulate a regenerative phenotype in recruited macrophages, while NT-3 was used to promote axonal survival and elongation. The combined expression was successful; axonal density and myelination were increased, and locomotor functional recovery in mice was improved.

"Inflammation plays a vital role in tissue repair and regeneration, and the use of a PLG bridge to take advantage of the inflammatory response to promote SCI repair is an elegant way to take advantage of these natural processes to improve SCI healing," says *Tissue Engineering* Co-Editor-in-Chief Antonios G. Mikos, Ph.D., Louis Calder Professor at Rice University, Houston, TX.

More information: Dominique R. Smith et al, Polycistronic Delivery of IL-10 and NT-3 Promotes Oligodendrocyte Myelination and Functional Recovery in a Mouse Spinal Cord Injury Model, *Tissue Engineering Part A* (2020). DOI: 10.1089/ten.tea.2019.0321

Provided by Mary Ann Liebert, Inc