



CeNeReg

Enhancing the
regeneration of the injured
central nervous system



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Antibodies against Nogo-A to enhance regeneration of the injured central nervous system

Nerve fibers in the adult central nervous system (i.e. spinal cord and brain) fail to regenerate after injury, and to date there are no therapies for enhancing their repair. Spinal cord injuries affect people's lives in a dramatic and long-term fashion, and the social and economic burden of life-long care is enormous.

For a long time there was a dogma that damaged fiber tracts of the central nervous system could not regenerate. However, there is accumulating evidence that specific inhibitory molecules found in myelin (protective layer around nerve fibers) are responsible for the absence of nerve fiber regeneration and the poor functional recovery after injury. This concept, as well as the most potent currently known growth inhibitor, the membrane protein Nogo-A, were discovered in Zurich by Professor Martin Schwab and his group. His team also demonstrated that antibodies blocking the function of Nogo-A led to long-distance regeneration of injured nerve fibers in the spinal cord of monkeys and rats, and greatly improved their functional recovery.

Based on these promising preclinical results, a phase I (first-in-man) clinical trial in patients with spinal cord injury was conducted, proving excellent safety and tolerability of a human anti-Nogo-A antibody. With the support of the Regenerative Medicine Technologies Platform of Wyss Zurich, the team will now produce a new batch of this therapeutic anti-Nogo-A

antibody. This antibody will enable the critical transition to phase II clinical trials, aimed to determine clinical efficacy of the anti-Nogo-A antibody in patients with spinal cord injury.

Beyond the field of spinal cord injury, these clinical studies will serve as a model for other disorders where nerve fibers of the central nervous system become injured, and may thus have a broad impact for the treatment of neurological diseases in general. A positive outcome of the planned clinical trials would be a real breakthrough in neurology, neuroscience and the field of tissue regeneration and repair.