

## **CONSIDERATION ON PHARMACOLOGICAL NEUROMODULATION FOR NEUROPROTECTION AND NEUROREGENERATION IN A RAT MODEL AFTER GRAFTING OF THE SPINAL CORD**

**Klaus von Wild**

*Medical Faculty University Münster, CEO kvw neuroscience Münster, D*

*In cooperation with*

*Tobias von Wild\*, Dafin Muresanu\*\*, Cornel Catoi\*\*\*, and Giorgio Brunelli\*\*\*\**

*\*Department of Plastic Reconstructive & Hand Surgery, Univ. Hospital UK--SH, Luebeck, D*

*\*\*Director Centre of Neuroscience & Neurology, University of Medicine and Pharmacy, Cluj, RO*

*\*\*\*Faculty of Veterinary Medicine, Univ. of Agricultural Science and Vet. Med. Cluj-Napoca, RO*

*\*\*\*\*Giorgio Brunelli, Facoltà di Medicina Università di Brescia, Fondazione Giorgio A. Brunelli, I*

**Objective:** Pharmacological neuroprotection and neurorecovery is crucial in restorative neurosurgery after spinal cord injuries and brachial plexus avulsion. Consideration on the unexpected beneficial pharmacological effects of Cerebrolysin® with regard to CNS plasticity and pharmacological neuromodulation of neuroprotection and neuroregeneration supporting neurorecovery.

**Methods:** Cerebrolysin® (FPF 1070 EVERS) is a combination of active fragments of neurotrophic factors of lipid-free pig brain-proteins that has been shown experimentally and clinically to modulate CNS nerve cell regeneration and neuroprotection. Systemic administration of Cerebrolysin was prospectively analysed in the modified *BRUNELLI'S Paradigm* (outgrowth of the 1<sup>st</sup> motor neuron into peripheral nerve) in rats: 3 groups of 10 each: double-blinded Cerebrolysin® and placebo (phsiolog, NaCl) administration( 5ml/kg i.p.) and controls over 14 days after positioning the sural nerve graft within the right lateral spinal cord funiculus with co-adaption to a distal motor nerve stump.. Objective analysis after three months (emg, nct, fast blue retrograde tracer, neurohistopathology (in Cluj).

**Results:** Re-innervation was confirmed within the anterior cervical spinal cord (ventral horn) and sensory cells dorsally when Cerebrolysin® caused a marked neuroprotection and neuroregeneration within the I cord, around the lesions (implantation) and inside the graft.

**Discussion:** Pharmacological neuromodulation is possible. This is crucial in human restorative cord and brachial plexus surgery.

**Conclusion:** Cerebrolysin® has been shown to modulate CNS plasticity in *Brunellis Paradigm*.

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