

Treatments for Spinal Cord Injury: Need for Optimization and Mechanisms

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Rehabilitation approaches aim to engage residual neuronal networks to improve functional recovery after spinal cord injury (SCI). While exercise training facilitates functionally relevant muscle activity below the level of injury, it is clear by now that these gains can be enhanced by combining exercise training with other therapies. During my presentation, I will discuss different neurostimulation therapies used to facilitate recovery in patients with SCI, how these therapies are combined with exercise training (pros and cons), and steps that can be taken for protocol optimization. Our results suggest that protocol optimization can have an impact not only on the strength of functional outcomes but also on providing mechanistic guidance to further recovery. Knowledge gained from non-invasive Hebbian-based stimulation to target multiple upper and lower limb muscles to facilitate recovery in people with SCI will be used during the presentation. Examples on how understanding reorganization of neuronal pathways after SCI can be critical to the design of more effective rehabilitation therapies will be presented.