



# Colloquium

## Clinical Colloquium Regenerative Medicine

**Monday, August 26<sup>th</sup>, 13:00 – 14:00**

**Institute for Regenerative Medicine - IREM**

**Wagistrasse 12, 8952 Schlieren**

**Seminar room 9<sup>th</sup> floor**

### **Prof. Martin Schwab**

**Institute for Regenerative Medicine - IREM, University of Zurich**

## **Anti-Nogo-A antibody therapy for spinal cord injury and stroke: From animal to humans**

Following injury of the brain or spinal cord, lesioned nerve fibers can spontaneously grow new branches and form new connections. Specific neurite growth inhibitory factors were found to restrict plastic and regenerative nerve fiber growth in the adult brain and spinal cord. The membrane protein Nogo-A is a well characterized neurite growth inhibitor in the adult CNS. Nogo-A activates an intracellular signalling cascade via multisubunit receptor complexes. Function blocking antibodies against Nogo-A have been applied to rats and macaque monkeys with spinal cord injuries as well as animals with large stroke lesions of the sensory-motor cortex. In the spinal cord, injured fibers showed enhanced regenerative sprouting as well as long-distance regeneration with formation of large terminal arbors. Spared fiber tracts showed enhanced compensatory sprouting, often covering relatively long distances. In animals with cortical strokes, fibers from the intact corticobulbar or corticospinal system crossed the midline, supplying functional innervation to the denervated brain stem and spinal cord under the influence of anti-Nogo-A antibodies. Functional recovery, including bladder function after large, incomplete spinal cord lesions, was improved. Many functions could be further enhanced by intense rehabilitative training. - Antibodies against human Nogo-A were shown to be well tolerated and safe after 4 weeks of continuous intrathecal application into the lumbar liquor space in a clinical Phase 1 trial in tetra- and paraplegic patients. These antibodies are currently entering a Phase 2 multicenter European clinical trial for acute cervical spinal cord injury. A Phase I/II trial for stroke is in preparation.