



Spinal cord repair from endogenous stem cells in the spinal niche, (NEURONICHE)

Project Coordinator: Prof. Catherina G. Becker, The University of Edinburgh, Centre for Neuroregeneration, MRC, Edinburgh, United Kingdom

Project Partners: Dr. Jean-Philippe Hugnot, INSERM, U1051- Université de Montpellier Institute for Neurosciences of Montpellier, ANR, Montpellier, France

Dr. Michell M. Reimer, TU Dresden, DFG-Center for Regenerative Therapies Dresden Cluster of Excellence, BMBF, Dresden, Germany

Dr. Matthias Kirsch, TU Dresden, Dept. of Neurosurgery, Carl Gustav Carus Universitätsklinikum Dresden, BMBF, Dresden, Germany

Dr. Serge Muyldermans, Vrije Universiteit Brussel, Cellular and Molecular Immunology, FWO, Brussels, Belgium
PhD Urszula Sławińska, Polish Academy of Science, Nencki Institute of Experimental Biology, Laboratory of Neuromuscular Plasticity, Department of Neurophysiology, NCBR, WARSAW, Poland

Spinal cord injury in humans leads to permanent loss of function. This is despite the presence of stem cell like cells in the spinal cord. In contrast, the zebrafish regain full swimming capacity after a lesion and its spinal stem cells make new neurons that contribute to the repair.

Here we plan to identify the signals acting on the stem cells in the fish to then use them to improve the reaction of stem cells of humans (in a dish) and spinal cord repair in rat models. In the course of the project, we will develop tools that will aid our research, but also contribute to the work of our colleagues in the community: We will develop small proteins that can be used to drive stem cells into a repair type, we will adapt a new microscopy technique to monitor repair in live fish and rats as it happens, and we will develop new stem cell lines directly from human spinal cord material. This project will identify repair factors that could then be taken into clinical trials. Our team comprises colleagues from the UK, Germany, Belgium, France and Poland, among them basic neuroscientists and neurosurgeons.