Preface

The National Centres of Competence in Research (NCCRs) were set up as a research promotion tool of the Swiss government and realized by the Swiss National Science Foundation. By promoting the NCCRs, Switzerland intends to strengthen research in strategically important areas, such as innovative technologies or diseases of major societal impact. Federal support of an NCCR lasts around 10 years. The currently ongoing NCCRs were rigorously selected among hundreds of applications and were considered as being of nationwide importance, high quality with a particular emphasis on interdisciplinary and innovative approaches within the disciplines.

Each NCCR consists of a 'leading house' and a network of partners from the university or extra-university spheres. Zurich took such a lead successfully for the NCCR 'Neural Plasticity and Repair' (NCCR Neuro). Diseases of the central nervous system (CNS) are among the most debilitating illnesses, putting an enormous strain on both social and health care budgets in Switzerland. To date, only limited help is available to patients suffering from disorders such as Alzheimer's disease, stroke, epilepsy, multiple sclerosis or traumatic CNS injury, which affect more than 200,000 patients in Switzerland. Altogether, the underlying aetiologies are still poorly understood. There are currently no treatments available that can halt or prevent, let alone reverse nerve cell degeneration. The NCCR Neuro was designed to improve our molecular understanding of the aforementioned devastating diseases to develop better treatments or even

cures. In particular, the NCCR has two principal tasks: to develop innovative treatments and new forms of rehabilitation in order to significantly improve the quality of life of the patients affected, and to train recruits for the research professions to an internationally recognized level. Scientists from the domains of basic and clinical research work together towards this goal in a total of 53 research groups. At present, the NCCR Neuro consists of eight projects: (1) Neural Stem Cells: An Integrated Approach to Basic Knowledge and Therapeutic Applications; (2) Alzheimer's Disease; (3) Functional Recovery after Stroke; (4) Epilepsy: New Models and Therapeutic Strategies; (5) Cortical Plasticity; (6) Infection and Immunity of the Central Nervous System; (7) Spinal Cord Repair; (8) Rehabilitation Technology Matrix. Additional support is provided from four 'Centers of Technical Expertise' with the topics 'Novel Transgenic Systems', 'Advanced Assessment of Animal Behaviour', 'Proteomics' and 'Animal Imaging'.

This special issue has selected a few highlights from this programme demonstrating the progress made in the fields of Alzheimer's disease, stroke, epilepsy, spinal cord injury and brain inflammation. Particular emphasis is placed on innovative therapeutic strategies including the use of stem cells, rehabilitation technologies and mechanisms of neuronal plasticity. It is hoped that such integrated endeavours will help to identify novel avenues for treatment and prevention of CNS diseases in the future.

Paul Herrling, Christoph Hock, Roger M. Nitsch