



Early mechanistic BIOmarkers for late Epilepsy and long-term Brain Injury Outcome (EBio2)

Project Coordinator: Prof. Dr. med. Jens Dreier, Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Center for Stroke Research Berlin (CSB), BMBF, Berlin, Germany

Project Partners:

Prof. Alon Friedman, Dalhousie University, Department of Medical Neuroscience, CIHR-INMHA, Halifax Nova Scotia, Canada

Dr. Annamaria Vezzani, Mario Negri Institute for Pharmacological Research IRCCS, Department of Neuroscience, MOH, Milano, Italy

Ischemic and hemorrhagic stroke and traumatic brain injury (TBI) are leading causes of death and disability, imposing a burden on patients, their families, and society. Through a combinatorial approach based on improved and novel analyses of electrocorticography (ECoG), brain magnetic resonance imaging (MRI) and selected blood molecules, we will search for common fingerprints of neuro-vascular-astrocytic network dysfunction reflecting early lesion progression and late epilepsy. Retrospectively, we will identify the most promising biomarker combination exploiting our prospectively collected database of 200 patients with aneurysmal subarachnoid hemorrhage (SAH) who underwent 14-day neuromonitoring, had MRIs at 4 different time points, and were evaluated for outcome at 6 months and for epilepsy at 3 years. In a lateral translation approach, we will test the predictive value of the proposed biomarkers for neurological outcomes with a focus on epilepsy in 3 animal models of brain injuries. We envision a revolution in real-time monitoring of post-injury brain dynamics that will allow novel personalized treatments.