

IMPROVING RESEARCH IN EPILEPTOLOGY

Thomas Grunwald

Swiss Epilepsy-Clinic Clinic Lengg AG, Zurich, Switzerland

As recognized by the World Health Organization (WHO) in its „Resolution on the Global Burden of Epilepsy“, epilepsy is „one of the most common serious chronic neurological diseases, affecting 50 million people of all ages globally“. The progress of epileptology during the last decades has made it possible that the majority of patients can be free from seizures if appropriately diagnosed and treated. Nevertheless, about one third of all epilepsy patients suffer from medically intractable epilepsies. The burden of epilepsy therefore necessitates continuing clinical and basic scientific research as well as further efforts to improve epilepsy management in all countries.

The Swiss Epilepsy Clinic, which is part of Clinic Lengg in Zurich and the medical arm of the Swiss Epilepsy Centre, aims at contributing to research in epileptology by developing methods for MR-image processing (1) and by improving the analysis of eeg-recordings from the skull (2) and from within the human brain (3). Moreover, neurophysiological and neuropsychological studies performed during non-invasive and invasive evaluations of patients considered for possible epilepsy surgery can also offer insights into neuropsychological (sub)processes of the human brain mediating e.g. memory, emotions, language, rhetoric and social cognition (4).

These interdisciplinary studies depend on cooperation. We are proud on ours – not least on those with the University Hospital Zurich within the framework of the Zurich Centre for Epileptology and Epilepsy Surgery, with the Institute of the Performing Arts and Film of Zurich University of the Arts and with NeuroPro.

(1) e.g. House PM et al. (2015) Morphometric MRI analysis enhances visualization of cortical tubers in tuberous sclerosis. *Epilepsy Research* 117, 29-34.

(2) e.g. Mothersill IW et al. (2012) A reappraisal of the value of interictal EEG findings in diagnosing epilepsy plus a critical review of controversial “normal variants”, utilising long-term ambulatory EEG recordings. *Schweizer Archiv für Neurologie und Psychiatrie* 163, 11-18.

(3) e.g. Burnos S et al. (2014) Human intracranial high frequency oscillations (HFOs) detected by automatic time-frequency analysis. *PLoS One*. 9(4): e94381. doi:10.1371/journal.pone.0094381.

(4) e.g. Broicher SD et al. (2012) "Tell me how do I feel" – emotion recognition and theory of mind in symptomatic mesial temporal lobe epilepsy. *Neuropsychologia* 50, 118-128. Mecklinger A et al. (2014) Cross-cultural differences in processing of architectural ranking: Evidence from an event-related potential study. *Cognitive Neuroscience* 5, 45-53. Toller G et al. (2015) Right mesial temporal lobe epilepsy impairs empathy-related brain responses to dynamic fearful faces. *Journal of Neurology* 262:729-741. Toller G et al. (2015) Right fronto-limbic atrophy is associated with reduced empathy in refractory unilateral mesial temporal lobe epilepsy. *Neuropsychologia* 78, 80-87.

