

Nóra Pető

Project title: *Epileptic Arousals*

Duration	6 months
Short Bio	I am a certified neurologist and a trainee in clinical neurophysiology at the National Institute of Mental Health, Neurology, and Neurosurgery in Budapest, Hungary. During my training, I have taken part in the non-invasive and invasive presurgical evaluation of pharmacoresistant epileptic patients at the Epilepsy Monitoring Unit. I gained some experience in intraoperative neuromonitoring and -beforehand - in the field of somnology in the sleep laboratory of the Hungarian Defence Forces Health Care Center. So far, my work has involved the sleep microstructure of ANT DBS implanted epileptic patients, the safety and efficacy of our patients treated with the novel ASM cenobamate, epidemiology and clinical phenotype of narcolepsy, screening of obstructive sleep apnea (validating a new questionnaire for drivers). Lately, my main interest is the relationship between sleep and epilepsy along with the differentiation of nocturnal events with various etiologies.
Home Institution	National Institute of Mental Health, Neurology and Neurosurgery, Department of Neurology and Epileptology
Host institution	Uniklinik Freiburg, Department of Presurgical Epilepsy Diagnostics, Epilepsy Center
Project description	Epileptic activity might manifest without any significant semiological feature, the only sign of it being the arousal or awakening from sleep. These epileptic arousals (EAs) are rarely investigated events and are not listed as a distinct seizure type in the ILAE classification. Our objective was to identify and analyze epileptic arousals of patients with temporal or frontal lobe epilepsy. We reviewed the EEG recordings of patients undergoing long-term video EEG monitoring at the Epilepsy Centre of the Freiburg University Clinic. The first part of the study comprised the evaluation of 52 scalp EEG recordings. We aimed to evaluate the minor behavioral characteristics and heart rate increase accompanying the ictal events and compare them with the same patients' physiological arousals (PAs). Distinguishing ictal patterns was necessary, but often difficult due to artifacts. Thus, epileptic arousals may falsely appear as PAs. However, simultaneous intracranial and scalp EEG recording technique can immensely increase the sensitivity. So, we evaluated the EEG recordings of patients who underwent invasive stereo EEG investigation with simultaneous use of scalp electrodes. After detecting the EAs and PAs manually, we intended to measure the differences in the heart rate increase. The fact that almost two-thirds

	of EAs were undetectable by surface-EEG, underpins the need for a non-invasive biomarker.
Personal statement	I believe that I learned a lot during my fellowship about the ways of planning and conducting a long-term research project, advanced methodologies, and the subtle characterization of EEG patterns, even on intracranial EEG. Besides, I gained insight into the clinical practices of non-invasive and invasive presurgical evaluation at this cutting-edge center, which should be useful for my institute, too.