Laboratory title : CNRS UMR 5293 - Erwan Bézard

Supervisor

Name : Pierre BURBAUD

Thesis title :
Role of the striatum in the pathophysiology of focal epilepsy: a translational study from non human primate to humans

Keywords : epilepsy, basal ganglia, SEEG, subcortical electrophysiology, Behavior

Contact

Firstname : Pierre                                      Name : BURBAUD

E-mail : pierre.burbaud@u-bordeaux2.fr

phone number : 05 47 30 42 57

Fax :

Abstract

The role of the basal ganglia in the pathophysiology of epilepsy remains a matter of debate. Although a line of evidence obtained in rodent models of epilepsy suggest that they may play a part, at this point no empirical evidence in primate has been documented. The present PhD project is based on a translational approach encompassing an experimental study in non-human primate and electrophysiological recordings in human patients undergoing intracranial evaluation for seizure localization. We plan to induce epileptic seizures by pharmacological manipulations of the GABAergic and cholinergic intrastriatal interneurons in 2 non-human primates and concurrently record neuronal activity within the basal ganglia and primary motor cortex. Subsequently, we will correlate neuronal activity with video recordings of the induced partial motor seizures. For the second part of the study, 20 epileptic patients will be included after having given their informed consent about the nature of exploration. In these patients, SEEG recordings will be performed using intracerebral multiple contact electrodes placed intracranially. Electrode positioning will be established in each patient based on clinical manifestation during seizure onset. When electrodes tracks will allow it, the deepest contacts will be introduced in different parts of the striatum, and globus pallidus. We plan to record neuronal activity both in cortical areas and in the basal ganglia in order to study the possible diffusion of cortical activity the basal ganglia network during epileptic seizures. This translational study aims to provide the first evidence of the involvement of the basal ganglia in the pathophysiology of epilepsy in the primate and consequently may open new avenues for the treatment of epilepsy.

Qualification required

Physiology, Neuroscience or Cognitive Neurosciences background