

Network dynamics in Alzheimer's disease

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This project will investigate changes in rodent hippocampal network activity during Alzheimer's disease. It is well established that there are changes in electroencephalogram (EEG) in Alzheimer's disease, with an increased incidence of seizures and a slowing of scalp EEG at later stages. We have set up a system to acquire continuous EEG from freely moving mice using a wireless telemetry system (Chang et al., 2011; Wykes et al., 2012). These recordings will be used to acquire EEG data of mice over approximately one week, in both waking and sleep. The project will compare EEG data from transgenic mice with familial AD mutations and controls. It will require development of methods for analysis of large data sets of EEG (possibly in combination with EMG and/or video) for example, to detect seizures, changes in EEG spectrum, EEG coherence/synchronisation and sleep EEG. There will also be the opportunity to learn in vivo EEG recordings. These data will be related to in vitro experiments that probe the network structure, which will open up possibilities to investigate the effects in network models.