



Principal Investigator Grant

Project

«Noradrenergic control of mammalian sleep architecture and arousability – towards novel sleep biomarkers for preclinical stages of Alzheimer’s disease»

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Main applicant

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Gaining insight into the roles of sleep for neuronal function

Various sleep problems arise at preclinical stages of Alzheimer’s disease (AD). Understanding their origins bears the potential for directed therapeutic management. Histopathological findings implicate the noradrenergic locus coeruleus (LC) at preclinical stages of AD. We found recently that the LC is a central focal point of fragile sleep patterns in the healthy brain. To connect AD and sleep research, we propose that abnormal noradrenergic signaling during non-rapid-eye-movement sleep (NREMS) causes specific forms of sleep fragmentation at early AD stages.

Through combining sleep monitoring with on-line fiberoptic measures of noradrenaline dynamics and LC activity, causal mechanistic links between altered LC activity and physiological correlates of spontaneous arousability from NREMS in a mouse model of AD prior to, at the onset, and during the disease can be established. Through deciphering the fine signatures of LC-related sleep disruptions, propositions for specific sleep assessments in patients at risk for AD will become possible