Master position:

Role of Slow Wave Sleep Delta Power on Amyloid Beta Clearance and Accumulation in a Mouse Model of Alzheimer Disease

Recent evidence from murine models of Alzheimer's disease (AD) suggests that chronic sleep induction significantly decreases amyloid beta (Aß) accumulation in the mouse brain, whereas chronic sleep restriction has an opposite effect. In recent studies, our group showed that delta-rich slow-wave sleep (SWS) induction after traumatic brain injury in rats or during the course of Parkinson's disease (PD) progression in mice reduces the accumulation of amyloid precursor protein (APP) in injured rat brains and cortical alpha-synuclein (α-syn) in PD mouse brains, respectively. However, the mechanism by which sleep reduces aberrant protein deposition in neurodegenerative diseases is still elusive.

We aim at examining whether enhancing slow oscillations during SWS has an impact over Aß and clearance rates, and consequently on its deleterious accumulation and the concomitant onset of behavioral phenotypes observed in a mouse model of AD. For that, we use pharmacological interventions or a titrated time-locked acoustic stimulation to modulate SWS. We target short and long treatments either early or late in the pathological progression, and perform cognitive testing to assess phenotypic recovery and, subsequently, determinations of the amount of accumulated protein by biochemical and histochemical analyses in several areas of the mouse brain.

Your tasks:

- Literature research.
- Record keeping.
- Sectioning, mounting and staining brain tissue of mice, microscopy and stereology, genotyping and phenotyping of mutant subjects.
- Treatment interventions.
- Scientific presentations.

Your opportunities:

- Gaining various experimental skills.
- Development of time and responsibilities management.
- Working within an international team.
- Improving oral and written scientific communication skills.

You must be:

- Currently enrolled in a Master's degree program.
- Available for 6 months – 1 year thesis period in 2019/2020.
- Fluent in English language. German is a plus.

Would help if you are:

- Experienced in rodent handling.
- Knowledgeable in neuroscience.
- Specially interested in neurodegenerative diseases.

INTERESTED?
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