Enhancing sleep to prevent cognitive decline

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Disturbed slow wave sleep (SWS) has been identified as an early, modifiable risk factor for dementia. SWS is crucial for memory and metabolic clearance functions, and lack of SWS causes these important functions to suffer, which in turn worsens cognitive decline. A vicious cycle forms between cognitive decline and loss of SWS. Improving SWS could be a way to break this cycle by providing the much-needed opportunity for the brain to recuperate and ameliorate cognitive decline. In a series of studies, we aim to enhance slow wave activity in older adults using phase-locked auditory stimulation (PLAS). Our laboratory-based results show that the physiological response to PLAS predicts improvement of memory functions and metabolic clearance in both healthy individuals, as well as individuals with subjective cognitive decline and/or mild cognitive impairment. However, these effects only manifest after repeated stimulation. As laboratory-based studies quickly become economically and logistically unfeasible, we propose a prolonged intervention study at participants’ homes using mobile PLAS-capable devices.

Chair: Prof. Antoine Adamantidis, PhD