DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

AARHUS UNIVERSITY

DANDRITE Lecture

Tuesday 20 November 2018 | 15:30 – 16:30 | Auditorium A (build. 1162 – 013)
Ole Worms Alle 4, 8000 Aarhus C

Antoine Adamantidis

Prof. Antoine Adamantidis is an Associate Professor in the Dept of Neurology at the University of Bern and holds a joined appointment in the Dept of Clinical Research. He is the co-director for the Zentrum for Experimentale Neurologie (ZEN labs) at the Inselspital. He also has an Adjunct Professor position in the Dept of Psychiatry at McGill University, Montreal, Canada. He obtains his pre- and postdoctoral education at the Universities of Liege, Belgium, and at Stanford Medical School, USA, respectively.

Thalamic dual-modulation of sleep and wakefulness

Slow-waves (0.5 - 4 Hz) predominate in the cortical electroencephalogram during non-rapid eye movement (NREM) sleep in mammals. They reflect the synchronisation of large neuronal ensembles alternating between active (UP) and quiescent (DOWN) states and propagating along the neocortex. The thalamic contribution to cortical UP-states and sleep modulation remains unclear. Here we show that spontaneous firing of centromedial thalamus (CMT) neurons in mice is phase advanced to global cortical UP-states and NREM–wake transitions. Tonic optogenetic activation of CMT neurones induces NREM–wake transitions, whereas burst activation mimics UP-states in the cingulate cortex (CING) and enhances brain-wide synchrony of cortical slow-waves during sleep, through a relay in the antero-dorsal thalamus (AD). Finally, we demonstrate that CMT and AD relay neurones promote sleep recovery. These findings suggest that tuning of CMT neuronal firing can modulate brain-wide cortical activity during sleep and provides dual control of sleep-wake states.

Host: DANDRITE Affiliated Researcher Marco Capogna, Dept. Biomedicin, Aarhus University