

Virtual DANDRITE Lecture

Wednesday 27 April 2022

11.30 – 12.30 (CET)

Online via Zoom

Please find Zoom link via the Outlook calendar invitation. If you have not received this, please write an e-mail to Astrid Munk, asmu@dandrite.au.dk



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Role of amygdala and dopamine in the mechanism of REM sleep initiation

Mammalian sleep is characterized by alternating periods of NREM and REM sleep, with REM sleep, the stage in which vivid dreams usually occur, occurring after stages of NREM sleep. However, how the brain regulates sleep and the cycle between sleep states has been poorly understood. While pharmacological studies have indicated that DA can modulate REM sleep, the neurotransmitter, which is most associated with pleasure and addiction, is absent in most commonly used REM sleep models. We found that a transient increase of dopamine (DA) in the basolateral amygdala (BLA) during NREM sleep terminates NREM sleep and initiates REM sleep. DA acts on dopamine receptor D2 (Drd2)-expressing neurons in the BLA to induce the NREM-to-REM transition. This mechanism also plays a role in cataplectic attacks—a pathological intrusion of REM sleep into wakefulness—in narcoleptics. These results show a critical role of DA signaling in the BLA in initiating REM sleep and provide a neuronal basis for sleep cycle generation.