

Sleep and Cognition and their alteration by instrumental conditioning

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The suggested functions of sleep are manifold, involving adaptive strategies, physical recovery and more recently "offline" information reprocessing. A growing body of evidence is now supporting the latter role - sleep for memory consolidation. So called "sleep spindles" - oscillatory events in the 12-15Hz range prevailing during light human non-REM sleep - related to these phenomena drew our attention in the last couple of years. Besides studying spindles and their significance for memory processing we recently succeeded in characterizing the cerebral correlates of spindles using simultaneous electroencephalography and functional magnetic resonance imaging (EEG/fMRI) during sleep. We will review this literature and present recent data where we succeeded to modify these typical light sleep patterns by means of instrumental conditioning. Intriguingly, interfering with sleep in that way did have profound effects on memory as well as sleep quality.