

Sleep in a dish

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Tafti lab has established an *in vitro* model of sleep, recapitulating the electrophysiological, transcriptome and metabolome correlates of sleep. We show that cell assemblies of cortical, thalamic, and thalamo-cortical co-cultures mimic oscillatory patterns of the slow oscillation, delta waves, and spindles, respectively, where the slow oscillation travels in cortical cultures and spindles have strong coupling to the slow oscillation in thalamo-cortical co-cultures. Our findings show that NREM sleep with its oscillatory characteristics represents a default mode of thalamo-cortical networks and provide a powerful tool to investigate basic mechanisms of sleep oscillations and to discover their molecular and cellular underlying pathways.