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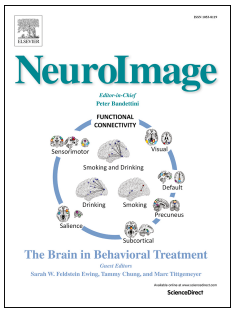

Theta band network supporting human episodic memory is not activated in the seizure onset zone

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Title: Theta Band Network Supporting Human Episodic Memory is Not Activated in the Seizure Onset Zone

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Abstract

Episodic memory, everyday memory for events, is frequently impaired in patients with epilepsy. We tested patients undergoing intracranial electroencephalography (intracranial EEG) monitoring for the treatment of medically-refractory epilepsy on a well-characterized paradigm that requires episodic memory. We report that an anatomically diffuse network characterized by theta-band (4-7 Hz) coherence is activated at the time of target selection in a task that requires episodic memory. This distinct network of oscillatory activity is absent when episodic memory is not required. Further, the theta band synchronous network was absent in electrodes within the patient's seizure onset zone (SOZ). Our data provide novel empirical evidence for a set of brain areas that supports episodic memory in humans, and it provides a pathophysiologic mechanism for the memory deficits observed in patients with epilepsy.

Keywords: episodic memory, coherence, theta band, seizure onset zone, electrocorticography