



Distinguished Lecture Series



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Frontal Cortex and Human Behavior: Insights from Intracranial Recording

Wednesday, April 5th

**1:00-2:30pm, Conrad Prebys Aztec Student Union
Theatre, 2nd Floor**

Neuropsychological evidence documents the critical role of prefrontal cortex (PFC) in goal-directed behavior. Intracranial recording provides unique insights in the role of PFC in human cognition. Neurophysiological dogma classically stated that the human cortex did not generate reliable rhythms above 50 Hz. However, findings over the last decade from intracranial recording report neural activity up to 250 Hz in the human cortex in every cognitive process examined (70-250 Hz, high frequency band; HFB). Importantly, HFB activity has superb spatial localization and task specificity and provides an index of local cortical activation. HFB recording has provided novel insights into language processing, decision making, social cognition, motor control, sensory perception and memory. Importantly, HFB activity is also phase locked to the trough of slower cortical oscillations (theta band 4-8 Hz) with different PFC dependent tasks eliciting unique spatial patterns of HFB-theta inter-frequency coupling. This transient coupling between low- and high-frequency brain activity provides a powerful mechanism for integration and communication in distributed neural networks engaged during PFC dependent cognitive processing. The results obtained from intracranial recording support the proposal that the devastating human frontal syndrome can be viewed as a failure of the PFC control of distributed neural networks subserving human behavior.

[SDSU Center for Clinical and Cognitive Neuroscience](#)

*2:30-3:30pm, Light reception to follow on the 4th floor outdoor terrace Student Union
Paid parking is available in PS6.*