Alyssa A. Brewer, MD, PhD

Associate Professor, Departments of Cognitive Sciences and Linguistics, Centers for Cognitive Neuroscience & Engineering and Hearing Research,

University of California, Irvine

Neuroimaging approaches to measure pain representations in human cortex and subcortex

Abstract:

One of the fundamental properties of mammalian brains is that sensory regions of cortex are organized into multiple, functionally specialized cortical field maps (CFMs). An individual CFM is composed of two orthogonal topographical representations, reflecting two essential aspects of a sensory feature space. This organization provides a basic framework for the complex processing and analysis of input from sensory receptors. Each CFM is thought to subserve a specific computation or set of computations that underlie particular perceptual behaviors by enabling the comparison and combination of the information carried by the various specialized neuronal populations within this cortical region. Emerging evidence from several labs is now demonstrating that multiple adjacent CFMs, in turn, are organized into a macrostructural pattern called the cloverleaf cluster in both human and macaque cortex. CFMs within cloverleaf clusters tend to share properties such as receptive field distribution, cortical magnification, and processing specialization. It is likely that such similar, efficient organization not only allows for a common reference frame throughout the processing hierarchy within each sense, but is also ideal for combining multi-modal information into a single percept. Dr. Brewer will review the evidence for CFM and cloverleaf cluster organization across human sensory cortex and the use of computational neuroimaging methods to investigate what changes occur in topographically organized cortex following various types of neurological trauma or disease. She will draw upon her work in the human visual and auditory systems to discuss the utility of using these approaches to investigate the structure and function of the cortical and subcortical pain matrix.

Gulf Coast Consortia
QUANTITATIVE BIOMEDICAL SCIENCES

Keck Seminar

Friday, April 6, 4pm

BioScience Research Collaborative

Auditorium

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