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### Research Interests

My research focuses on the neuroanatomy of emotion and the pathophysiology of abnormal emotion in psychosis, depression and anxiety disorders. This work has been carried out with tools provided by neuroimaging (PET and functional MRI) and event-related potentials (ERP collaborating with William Gehring). I co-direct the Psychiatric Affective Neuroimaging Laboratory, in collaboration with Israel Liberzon. While this work is ultimately directed at understanding psychiatric disorders, important groundwork begins with investigations directed at normal physiology relevant to psychiatric illness, with a specific focus on the role of the amygdala, sublenticular region and the dorsal medial prefrontal cortex in processing emotionally salient stimuli. Another interest concerns the interaction between cognition and emotion, an area of central importance for psychiatric illness. For example, the modulation of cortical regions devoted to object recognition by emotional content is an example of the intertwined nature of cognitive and emotional processing. Significant findings suggest that psychosis may involve a dysfunction in limbic brain regions that normally evaluate the emotional salience of stimuli, and this dysfunction likely entails abnormal interaction of limbic/emotional areas with prefrontal/cognitive areas. My work is actively engaged in testing these hypotheses with behavioral probes designed to evaluate dysfunction in persons with schizophrenia, as well as other psychiatric disorders, such as obsessive compulsive disorder.

The translation of our functional anatomic knowledge of psychiatric disorders may be accomplished by device-related neuromodulation. As co-director of the Psychiatric Neuromodulation Program (with Parag Patil of the Department of Neurosurgery), I am interested in using tools such as transcranial magnetic stimulation to probe brain function and treat disorders such as depression. Using



deep brain stimulation, we are also engaged in a multi-disciplinary effort to treat refractory depression and obsessive compulsive disorder.

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