RISE Talks Series

Who? Graham Cousens, Ph.D.

What? The smell of fear: Investigating the role of the amygdala in emotional processing

When? 12:00-1:00 on Friday, December 5

Where? Hall of Sciences, Room 326

The amygdala consists of a heterogeneous collection of nuclei situated within the temporal lobe of the mammalian brain. This region is involved in normal motivational, emotional, and social processes, and amygdala neuropathology is associated with a range of behavioral and affective disorders.

Research in our laboratory is aimed at understanding aspects of information processing in the rodent amygdala, and in particular, how amygdala circuits contribute to fear and anxiety. Most of our work is organized around the rodent's dominant sensory modality, olfaction. This approach enables us to take advantage of both the exceptional ability of rodents to perform odor-guided tasks and the dense, reciprocal anatomical connections between the amygdala and olfactory areas of the brain. These connections are less prominent in humans, but they likely support the ability of certain odors to evoke strong emotional responses.

Here I'll review briefly our current understanding of the role of the amygdala in fear and anxiety, and I'll describe previous findings from our laboratory implicating the corticomedial amygdala (CMe) in olfactory conditioned fear. Also, I'll describe our current research, which is aimed at characterizing how perceptual and affective features of odors may be encoded by single neurons and small clusters of neurons within the CMe and how odor representations may change with experience. This research may provide insight into broader principles of information processing that underlie normal and pathological emotional states.