
Presentation Abstract

Session: 160-Poster Session - Thursday

Thursday, May 14, 2015, 5:00 PM - 7:00 PM

Presentation: 349 - Neurophysiological Mechanisms Supporting Flexible, Context Specific, Emotional Regulation

Location: Concert Hall - Convention Floor

Pres. Time: Thursday, May 14, 2015, 5:00 PM - 7:00 PM

Keywords: Electrophysiology; Amygdala; Prefrontal cortex; Hippocampus; Emotion

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Abstract: **Background:** In everyday life the same stimulus can lead to different rewarding or aversive outcomes depending on the situation. Subjects must therefore recognize a stimulus and the situation, or context, in which it appears to predict outcome accurately and regulate emotions appropriately. Contexts may be defined by abstract factors, like knowledge of a social situation. We sought to identify where and how neural representations of abstract contexts emerge in the brain.
Methods: Two rhesus monkeys performed a task analogous to the Wisconsin Card Sorting Test, switching back and forth several times between two un-cued contexts where different rules must be applied to the same stimuli to maximize reward. During task performance, single neuron activity was recorded simultaneously in the amygdala and prefrontal cortex.
Results: Behavioral evidence indicated that monkeys understood that temporally contiguous events defined each context and therefore the set of rules-in-effect for stimuli. Moreover, all task-relevant variables, including stimulus identity, context, operant action, and expected reinforcement were encoded in each area. The representation of abstract context information was especially strong in the anterior cingulate cortex (ACC), which is prompting us to explore the relationship between ACC and hippocampus while monkeys learn new abstract contexts.
Conclusions: Neural representations of abstract cognitive information are likely important for updating representations of the emotional significance of stimuli. Information about abstract contexts emerges in same neural structures that orchestrate emotions, suggesting that the convergence of cognitive and emotional information in these areas underlies the regulation of emotion.

Disclosures: **S. Bernardi:** None.