

MURC 2019

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Presentation Format: 10-Minute Oral Presentation

Presentation Title: Orbitofrontal interactions with the amygdala differentially influence efficient risk/reward decision-making

Weighing the value of a reward against the likelihood of its delivery in order to optimize long-term gain is a fundamental component of adaptive decision-making. Both animal and human studies have implicated both the orbitofrontal cortex (mOFC) and the amygdala (BLA) in this form of cognition. Specifically in rats, inactivating either the mOFC or the BLA alone increases risky choice, raising the intriguing possibility that these two regions form a functional circuit that regulates efficient risk/reward decision-making. To address this, rats were well-trained on a probabilistic discounting task where they choose between a small, certain (1 pellet) and a large, uncertain (4 pellet) reward option, the odds for which decrease systematically across five blocks of trials (100% to 6.25%). An initial experiment used a chemogenetic approach to selectively inhibit neural activity within the mOFCBLA pathway. Disruption of this pathway increased risky choice in the later blocks of trials when it was no longer advantageous. This could reflect an inability to update or access the previously learnt value representation of the risky option as the odds of winning decreased across a session. In contrast, there was no effect among rats treated with a control virus. There remains a possibility that the opposing pathway projecting from the BLA to the mOFC is also involved in value-based decision-making, and results from this second experiment will also be discussed. Together, understanding how these complimentary pathways transmit information about risk/reward decision-making can provide insight into the neural circuitry underlying healthy and maladaptive choice behaviours.

Themes:

Check (highlight) the most applicable theme according to the abstract.

<input type="checkbox"/> Innovation and Technology	<input type="checkbox"/> Health and Wellness	<input checked="" type="checkbox"/> Culture and Society	<input type="checkbox"/> Sustainability and Conservation
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Comments: Very interesting study and well written abstract!