

Reward and Uncertainty in the Prefrontal Cortex

Professor Daeyeol Lee

Department of Neuroscience
Yale University

**July 18 (Tuesday), 2017,
15:00-16:00**

1F Seminar Room, BSI Central Building

Abstract

Uncertainty in the environment affects many aspects of decision making and hence its underlying neural mechanisms. For example, reward from recent actions has a greater effect on subsequent behaviors when the environment is uncertain. Similarly, in social settings, uncertainty in the behaviors of other agents often requires the use of complementary learning algorithms. In our experiments, we found that uncertainty strengthens neural signals related to reward history in the prefrontal cortex during a probabilistic reversal learning task. The results from the same experiment also suggest that the lateral prefrontal cortex might contribute to resolving the curse of dimensionality during reinforcement learning. We also found novel switching signals in the dorsomedial prefrontal cortex related to the deviation from simple reinforcement learning algorithm during competitive interactions with a computer opponent. These results suggest the prefrontal cortex implements diverse computational algorithms for adaptive decision making.