

# 脑与认知科学国家重点实验室学术报告

## Vigor and choice in the smooth pursuit eye movement system

报告人: **Dr. Mati Joshua**

报告时间: 2017年10月20日 (周五) 上午10:30 am

报告地点: 中科院生物物理所6737会议室

主持人: 杨艳研究员



### Experience

- |              |   |
|--------------|---|
| 2015-current | Senior lecturer, The Edmond&Lily Safra Center for Brain Sciences. The Hebrew University of Jerusalem. |
| 2010-2015    | Post-doc, Lab of Dr. Stephen G. Lisberger, in UCSF and Duke University.                               |
| 2004-2009    | PhD. Hebrew University of Jerusalem, Interdisciplinary Center for Neural Computation.                 |
| 1998-2001    | B.Sc. in Math and Computer Science, Israel Institute of Technology graduated summa cum laude.         |

### Publications

1. 2017 Dissecting patterns of preparatory activity in the frontal eye fields during pursuit target selection. *Journal of Neurophysiology*.
2. 2016 Signal, Noise, and Variation in Neural and Sensory-Motor Latency. *Neuron*.
3. 2012 Reward action in the initiation of smooth pursuit eye movements. *Journal of Neuroscience*.
4. 2009 Synchronization of midbrain dopaminergic neurons is enhanced by rewarding events. *Neuron*.

### Abstract

Expectation of reward has a powerful influence on motor behavior. To probe how and where reward systems alter motor behavior, we studied smooth pursuit eye movements in monkeys trained to associate the color of a visual cue with the size of the reward that is issued at the end of the target motion. We recorded neural activity in the Frontal eye field and found that reward had a multiplicative effect on the direction tuning of the cell. We then leverage our ability to control smooth pursuit speed by manipulating target motion and found firing rate modulation that can be attributed to reward exceed modulation that can be attributed to the eye movement parameters. We conclude that the reward is represented through the motor circuitry in ways that are not directly reflected in the behavior. We suggest that the effect of reward on behavior must be understood at the network level as an interaction between different pathways. We propose a framework for studying how the distributed representation of reward is linked to action.