

## **Abstract [Slide]**

Srinivasan L, Mitter SK, Brown EN, Hatsopoulos N. Structure of delay period target representation in premotor dorsal cortex (PMd). Society for Neuroscience Annual Meeting, Nov. 2006

## **Structure of Delay Period Target Representation in Premotor Dorsal Cortex (PMd)**

Monday, 10/16/06, 10:15 - 10:30 AM, Room B314, Georgia World Congress Center, Atlanta, GA, USA

**OBJECTIVE:** Premotor dorsal cortex (PMd) is believed to be involved in the representation of targets during the enforced delay period prior to visually-instructed reaching movements. We seek to understand the structure of the PMd response and demonstrate the extent to which aspects of the response contribute to target representation. **BACKGROUND:** Because of its extensive connectivity with other cortical and subcortical regions, it is unclear whether the PMd target representation can be adequately described with simple statistical models. Moreover, although various algorithms have demonstrated target decoding from PMd neurons, it remains an open question as to what extent various aspects of the PMd response contribute to the representation of targets. **METHODS:** In this study, we apply generalized linear models based on point process statistical methods to determine how elapsed time (time post-target-onset) and spiking history relate to the PMd response, and the extent to which these factors contribute to target representation. Action potentials are obtained from a population of 61 simultaneously recorded PMd neurons from a macaque monkey during a instructed-delay center out reaching task to 8 targets arranged evenly on a circle of 6 inches radius. **CONCLUSION:** PMd neurons span a diverse set of delay period target representations, of which more than 70% demonstrate both history and elapsed-time dependence. Log-linear point process statistical models adequately describe all target representations in 38 of the 61 recorded cells. Both history and elapsed-time dependencies contribute to faster, more efficient target representations than the average firing rate that is typically summarized in tuning curves.

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