

# Modulation of the sensorimotor transformation by the higher brain function

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## **【 Outline of survey 】**

One of the important neural functions in living organisms is the translation of sensory information to motor command. The basis of this information translation is a simple reflexive response. However, much of the sensorimotor reflexes in natural conditions do not necessarily evoke the same motor behavior to the same sensory stimulus. In higher primates, animals might respond differently to the same stimulus depending on the circumstances. They carry out movements and behaviors appropriate to each and every condition. In such circumstances, translation from sensory to motor information is modified by higher brain functions, and appropriate behaviors in line with the conditions are executed. In this project, we will focus on visual tracking responses of the eyes to study the translation of sensory to motor information, and in particular on the open-loop control in which the information translation is relatively simple. We will record neuronal activities of monkeys performing experimental tasks in which the gain of the initiation of visual tracking responses is modulated depending on the context, and study the functional roles of different parts of the brain under various conditions.

## **【 Expected results 】**

By studying the short-latency ocular tracking responses, a further understanding of the translation of sensory to motor information is expected, revealing the mechanism of how the translation is modified by higher brain functions and how appropriate responses are executed

## **【 References by the principal researcher 】**

Miura, K., Suehiro, K., Yamamoto, M., Kodaka, Y., Kawano, K., Initiation of smooth pursuit in humans: Dependence on target saliency. *Exp Brain Res.* 141, 242-249, (2001)  
Takemura, A., Inoue, Y., Gomi, H., Kawato, M., Kawano, K., Change in neuronal firing patterns in the process of motor command generation for the ocular following response. *J. Neurophysiol.* 86, 1750-1763, (2001)

**【 Term of project 】** F Y 2004 - 2008

**【 Budget allocation 】** 87,200,000 yen

**【 Homepage address 】** under construction