# Neural mechanisms of category formation and categorical reasoning

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## 【Outline of survey】

Animals can alter their behavior by learning the relationships of stimuli, reactions, and their consequences through experiences, in order to adapt to the environment. Especially higher animals such as primates can behave appropriately not only in experienced situations but also in unexperienced situations by using reasoning based on their past experiences. Inductive reasoning based on categories, a type of cognitive processes in which animals transfer information from a particular case of a category to another particular case of the same category, is regarded as the most intuitive and simple type of reasoning. The purpose of this study is to examine the neural mechanisms underlying category formation and categorical reasoning. We record brain activities by using electrophysiology and neuroimaging techniques, while subjects are performing a task requiring category formation and categorical reasoning.

## 【Expected results】

We aim to clarify how various brain regions function differently, and how they interact, in order to realize category formation and categorical inference. We are especially interested in functional differences and interactions between the prefrontal and inferotemporal cortex, as well as those between the cortex, limbic system, and basal ganglia.

## 【References】


- Sato Y, Yamada M, Iijima T, Tsutsui KI (2007) Performance of monkeys in a repeated group-reversal task requiring inductive reasoning. 37th Annual Meeting of the Society for Neuroscience Abstract.
- Yamada M, Sato Y, Iijima T, Tsutsui KI (2007) Involvement of the dorsolateral prefrontal cortex in inductive reasoning. 37th Annual Meeting of the Society for Neuroscience Abstract.


**【Term of project】 FY2007－2011**

**【Budget allocation】21,200,000 yen**
(2007 direct cost)

**【Homepage address】**

http://www.lifesci.tohoku.ac.jp/teacher/neuro/ts_tsutsui.html

http://sendaibrain.org/kyoten/tsutsui.html