



## Kowa KOIDA

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My research interest lies in the field of systems neuroscience, particularly in the functional relationship between visual perception and neuron activity in the cerebral cortex. The goal of my research is to understand neuronal processes that mediate color perception and object recognition. I have been conducting behavioral and physiological experiments with monkeys trained to perform perceptual tasks. Human psychophysics is also carried out to support correlative evidence between animal behavior and human perception.

### **Theme1 : Understanding neural basis for visual sensation and cognition**

Color is a premier model system for understanding how visual information is processed by neural circuits. Both the physical stimulus for color and the perceptual output experienced as color are quite well characterized, but the neural mechanisms that underlie the transformation from stimulus to perception are incompletely understood.

I am focusing on the inferior temporal cortex (ITC), where many neurons response to visual stimuli as highly selective and sophisticated manner. I found a patch organization of color selective cells in the ITC where clusters of neurons showed strong and fine color responses. To understand higher visual function taking place in the ITC such as effect of task demands, memory and utility, color response in the patch could become a useful target area for single unit recording and electrical microstimulation.

To perform chronological experiment with monkeys in TUT, newly-established floor will kick off soon.

Human psychophysics is carried out to find out new phenomena, visual illusion and critical feature of visual stimuli. Psychophysical measurement is important to supports correlative evidence between animal behavior and human perception.

**REF:** J. Neurosci. (2010) 30, p14955-63.

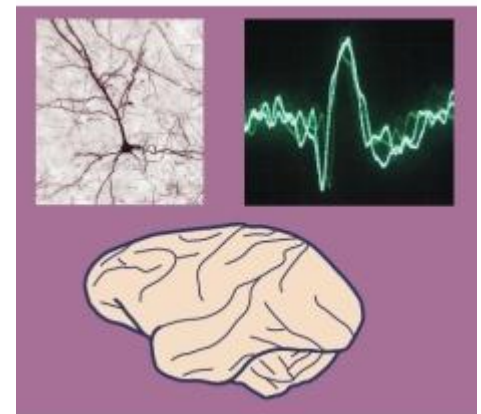
**Keyword:** Electrophysiology, Single-unit recording, Electrical microstimulation, behaving animal. Human psychophysics

Neurons, spiking activities of neuron and schematic illustration of the cortex of monkey.

### **Theme2: Establishing innovative method for neuroscience**

EIRIS have a strong advantage for Development of sensing device such as high density electrode with smart electrical circuits (amplifying, filtering, multiplexing). To test physiological benefit, chronological implanting the device into animal is vital.

**Keyword :** Electrode development



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