

Title: Establishment of Visuoauditory Associative Memory in the Auditory Cortex

Speaker:

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Abstract:

One important aspect of memory is association of different modality components/inputs. Associative memory is reflected in neuronal activities in different cortices after intensive training. This paper presents most direct evidences of the establishment of associative memory traces in the rat auditory cortex. We produced a conditioned association between cortical electrical activation and a visual stimulus, visualizing the physiological memory traces, i.e., auditory neuronal responses to the visual stimulus after conditioning. To confirm the visuoauditory memory behaviorally, we first associate the sound with the visual stimulus. The sound stimulus was then associated with the reward, and the establishment and recall of the associative memory was proven when the rat successfully secured the reward after the sound stimulus was replaced by the visual stimulus for the first time. The early and lasting appearance of memory traces indicates that the neocortex is involved in memory storage earlier than the hippocampus-neocortex transfer model suggested.

Biography of the speaker:

Prof. He obtained a B.Eng. and M.Eng. degree in Engineering at the Harbin Institute of Technology, a Doctoral Degree in Medical Science at the University of Tokushima, and a second Doctoral Degree in Engineering at the University of Tokyo, Japan. Before joining the Department in September 1998, Dr. He had worked at RIKEN

(Japan), the University of Tokushima, and Advanced Research Laboratory, HITACHI Ltd, Japan. Dr. He developed the first telemetric system for measuring blood flow velocity and ECG from human subject during exercise. Recently he developed an electronic "bat ear" for people with visual impairments.

Prof. He's main research interest is in systems neuroscience. He combines electrophysiological, anatomical and engineering approaches to investigate the fundamental questions of hearing, sleep, and learning and memory. Another line of his study lies on functional substitution for people with disabilities using electronic devices and neurorehabilitation.

Organizer: Prof. E.X. Wu