



CDB SEMINAR

Kentaro Abe

Graduate School of Biostudies, Kyoto University
PRESTO, Japan Science & Technology Agency

Tuesday, April 10, 2012
15:00~16:00 A7F Seminar Room

What songbirds can tell us

Summary

Among other animals, humans (*Homo sapiens*) are supposed to possess a unique ability to use languages to communicate with each other. Then, what computational ability differentiates human speech from the auditory communication of other animals? One of the unique features of the human auditory communication is assumed to be the processing of grammars, the hierarchical rules of the ordering of the elements such as words.

The vocal communication of passerine songbirds shares many features with the human speech, in regard to its developmental process and to the neuronal systems involved in handling the information. However, whether songbirds possess similar computational ability to process auditory information as humans is not known. By analyzing the spontaneous discrimination of auditory stimuli of the Bengalese finch (*Lonchura striata var. domestica*), we showed that they can discriminate even a subtle difference of the syllable sequence in their songs, and the processing of the syntactic information of the syllables can be used to discriminate them. We further discovered that this ability was acquired postnatally through the communication with various conspecifics. Recently, we identified the neuronal circuits involved in the postnatal acquirement of the ability to discriminate the vocal information. By using molecular and genetic approaches, such as generating transgenic songbirds, we also identified the signaling molecules involved in the postnatal learning of vocalization in the songbirds.

Our results reveal that songbirds postnatally acquire the ability to discriminate syntactic aspect of auditory information, an ability previously supposed to be specific to humans. Together, these results highlight the songbirds as a promising system to study how environmental factor, such as the education or the parental care, affects the postnatal development of animals.

Host:

Masatoshi Takeichi
Cell Adhesion and Tissue
Patterning, CDB
takeichi@cdb.riken.jp
Tel:078-306-3116
(ext:1321)