CDB SEMINAR

Speaker: David W McCauley

< Division of Biology, Caltech>

Title: "Development and evolution of a vertebrate innovation: The Neural Crest"

Date:	**Friday, April 8**
Time:	**15:00 P.M. - 16:00 P.M.**
Place:	**1F Auditorium of Building C, CDB**

Summary:

Neural crest cells are a defining character of vertebrates and were of prime importance in the evolutionary origin of the vertebrate body plan. This cell population migrates along stereotyped pathways and differentiates into many derivatives unique to vertebrates. In order to understand the conservation of neural crest developmental mechanisms, the agnathan lamprey, a relict jawless vertebrate, provides a natural outgroup to the more fully characterized gnathostome vertebrates and is useful for elucidating key changes in the evolution of this cell type. Cell-labeling experiments, combined with the identification of neural crest molecular markers have proved beneficial in understanding the migration of cranial neural crest cells.Cranial neural crest migration has been described in gnathostomes as occurring in three well-defined streams, from rostral to caudal termed mandibular, hyoid, and branchial arch streams respectively. Using cell-labeling and gene expression studies, we have compared migration of cranial neural crest in the lamprey with gnathostomes to uncover both similarities and differences in the migratory patterns of cranial neural crest between these two groups. These studies were then coupled with a protein knockdown approach to begin to investigate neural crest developmental mechanisms in the formation of the vertebrate branchial arches. The homology of gnathostome and agnathan branchial arches has been questioned based on observed developmental, morphological, and structural differences. Sox9, a member of the SoxE subfamily, has been shown in gnathostomes to play a role in chondrogenesis in the branchial arches. We used a morpholino antisense oligonucliotide approach to perturb function of a SoxE gene in the lamprey. Our results point to the conserved function of lamprey SoxE1 in formation of the branchial arches and provide support for the homology of developmental mechanisms involved in formation of these structures among agnathan and gnathostome vertebrates.

Host ： Shigeru Kuratani <Evolutionary Morphology Biology , CDB>

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