



CDB SEMINAR

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Monday, September 11

16:00~17:00 A7F Conference Room

Wnt signaling in Neural Crest development: from Induction to Migration

Summary

The neural crest (NC) is a unique and highly specialized population of cells found in all vertebrate embryos that has fascinated generations of developmental and evolutionary biologists. The NC develops at the border between the neural plate and the epidermis, and following closure of the neural tube these cells delaminate from the dorsal neural tube to migrate along different pathways.

I will address here two questions related to NC development: first, how is the NC INDUCED at the border of the neural plate; and, second, once the NC are induced how is the MIGRATION of these cells controlled.

Several inductive signals are required for NC induction, such as BMPs, Wnts, FGFs and RA; however we do not have a clear picture of how the NC is induced in a precise location along the medio-lateral and anterior-posterior axis of the embryo. By performing graft experiments as well as gain and loss of function experiments of different signals, we have shown that dorso-lateral mesoderm induces NC by producing Wnt8; while prechordal mesoderm inhibits NC at the anterior neural fold by secreting Dkk1.

We have shown that migration of neural crest requires the activation of the non-canonical Wnt signalling in *Xenopus* embryos, and recently we have extended our studies to zebrafish embryos. By using different zebrafish mutants of the PCP pathway we have been able to show that this pathway is essential for the early migration of the crest cells. In addition, we have found that Syndecan-4, a new element of the non-canonical Wnt signal, is required for neural crest migration.

Our results shows that Wnt signals are essential for NC development and they suggest that a switch from the canonical to the non-canonical Wnt pathways is required for the transition from NC induction to migration.

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