CDB SEMINAR

Speaker: Chika Yokota

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Title:

The “odd-man out” of nodal-related proteins regulates covergent extension movements via the FGF receptor.

Date:	**Wednesday, June 9**
Time:	**4:00 P.M. – 5:00 P.M.**
Place:	**1F Auditorium of Building C**

Summary:

Xnr3 is a unique member of the nodal sub-family of TGF-β molecules, and is known as a direct target of the maternal Wnt/β-catenin pathway. Xnr3 has different activity from the other five nodal-related genes isolated in Xenopus in several respects. Ectopic expression of Xnr3 in the ventral side of embryos causes finger-like protrusions, which lacks axis structure. Xnr3 cannot induce dorsal mesoderm or endoderm gene expression in presumptive ectoderm, whereas the other nodal-related proteins are known to be meso-endodermal inducers. Nodal-related proteins (Xnr1, 2, 4, 5, 6) induce down stream gene expression via activin receptor-smad2 pathway, but no direct study has been carried out on the Xnr3 signaling pathway.

Using a morpholino oligo to knock-down Xnr3 protein, we show that Xnr3 is required for convergent extension movement through the induction of Xbra expression. We also show that ectopic over-expression of Xnr3 mRNA in presumptive ectoderm causes convergent extension movement, and expression of Xbra, eFGF, and MyoD. These inductions require the FGF receptor FGFR1, since they are inhibited by the antisense depletion of maternal FGFR1 mRNA in presumptive ectoderm and whole embryos. In contrast, induction of neural markers (NCAM and Nrp1) by Xnr3 is not dependent on the FGF receptor. Furthermore, ectopic expression of Xnr3 in presumptive ectoderm activates MAP kinase, showing that Xnr3 activates the FGF signaling pathway. These findings reveal the essential role of Xnr3 during early inductive events, and suggest a novel role for a nodal family member; that of regulating cell movements through the FGF receptor.

Host : Fumio Matsuzaki **Cell Asymmetry, CDB**
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