CDB SEMINAR

Speaker: Kunimasa Ohta

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Title: " Tsukushi functions as a novel organizer inducer by inhibition of BMP activity in cooperation with chordin "

Date:	Tuesday, September 21
Time:	16:00 P.M.～ 17:30 P.M.
Place:	1F Auditorium of Building C, CDB

Summary:

Classical embryological experiments performed in amphibians revealed the existence of two inducing centers located on the dorsal side of the early embryo, which control induction and patterning of the embryonic axis in vertebrates. In the frog embryo, the Nieuwkoop center is established after fertilization in the dorso-vegetal sector of the blastula, and it induces the Spemann organizer in the overlying dorsal marginal zone. The organizer dorsalizes the adjacent dorso-lateral mesoderm and induces the nervous system in the dorsal ectoderm. This mechanism is largely conserved in other vertebrates. For example, during chick gastrulation, the middle of the primitive streak functions as "the node inducing center" that corresponds to the Nieuwkoop center in *Xenopus.* The node inducing center in turn induces Hensen's node, which corresponds to the amphibian Spemann organizer. It is known that the inhibition of BMP signaling is required for primitive streak formation and induction of Hensen's node.

We have identified a novel secreted protein, Tsukushi (TSK), which belongs to the Small Leucine-Rich Proteoglycan (SLRP) family and is expressed in the primitive streak and Hensen's node. Grafts of cells expressing TSK in combination with the middle primitive streak induce an ectopic Hensen's node, while electroporation of TSK siRNA inhibits induction of the node. In *Xenopus* embryos, TSK can block BMP function and induce a secondary dorsal axis, while it can dorsalize ventral mesoderm and induce neural tissue in embryonic explants. Biochemical analysis shows that TSK binds directly to both BMP and chordin and form a ternary complex with them. These observations indicate that TSK is a novel dorsalizing factor involved in the induction of Hensen's node.

Ref. Ohta et al., Dev. Cell (in press), Kuriyama et al., submitted.

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