CDB SEMINAR

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Thursday, June 4, 2009

16:00~17:00　C1F CDB Auditorium

Regulation of TCF3 Phosphorylation and Function by Wnt Signaling

Summary

T-cell factor 3 (TCF3) plays key roles in cell fate determination in vertebrate embryos and embryonic stem cell differentiation and has been implicated in Wnt signaling. Based on genetic evidence and knockdown experiments, vertebrate TCF3 proteins function largely as transcriptional repressors, although the mechanism of TCF3 regulation and function remains unclear. A commonly accepted model of Wnt signaling in Drosophila and mammalian cells involves target gene activation by a complex of a TCF family member with beta-catenin. Here we demonstrate that Wnt proteins stimulate rapid phosphorylation of TCF3 in Xenopus gastrulae and mouse embryonic stem cells. This phosphorylation event is essential for maintaining ventroposterior fate, involves homeodomain-interacting protein kinase 2 (HIPK2) and beta-catenin and leads to the dissociation of TCF3 from the promoter of Vent2, a Wnt target gene with a pivotal role in ventroposterior development. These results reveal a novel Wnt signaling mechanism operating to control cell fates in vertebrate embryogenesis.

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