



CDB SEMINAR

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Helmholtz Zentrum Muenchen - German Research Centre for Environmental Health (GmbH)

Friday, March 26, 2010

16:00 - 17:00 C1F CDB Auditorium

Identification and analysis of novel Spemann/Mangold organizer genes

The Spemann/Mangold organizer is a transient tissue critical for patterning the gastrula stage vertebrate embryo and formation of the three germ layers. Despite its important role during development, there are still relatively few genes with specific expression in the organizer and its derivatives. *Foxa2* is a forkhead transcription factor that is absolutely required for formation of the mammalian equivalent of the organizer, the node, the axial mesoderm and the definitive endoderm (DE). However, the targets of *Foxa2* during embryogenesis, and the molecular impact of organizer loss on the gastrula embryo, have not been well defined. To identify genes specific to the Spemann/Mangold organizer, we performed a microarray-based screen that compared wild-type and *Foxa2* mutant embryos at late gastrulation stage (E7.5). We could detect genes that were consistently down-regulated in replicate pools of mutant embryos versus wild-type, and these included a number of known node and DE markers. We selected 314 genes without previously published data at E7.5 and screened for expression by whole mount in situ hybridization. We identified 10 novel expression patterns in the node and 5 in the definitive endoderm. The genes identified in this screen represent novel Spemann/Mangold organizer genes as well as potential *Foxa2* targets. We have placed these genes in a *Foxa2*-dependent genetic regulatory network and we hypothesize how *Foxa2* may regulate a molecular program of Spemann/Mangold organizer development. Finally, we have functionally analyzed one of these node-specific genes and defined it as a novel developmental regulatory factor involved in ciliogenesis.

Host:

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