CDB SEMINAR

Jochen Wittbrodt

Developmental Biology Unit, EMBL

Monday, March 20
16:00~17:00
C1F CDB Auditorium

In silico Identification And in vivo Validation of an Ath5 Regulated Target Gene Battery

The increasing number of completely sequenced vertebrate genomes provides a unique resource to unravel conserved non coding elements involved in controlling cellular differentiation programs. Here we present a hybrid bioinformatics and experimental approach to predict and validate the targets of the transcription factor atonal homologue 5 (Ath5), a gene crucially involved in retinal ganglion cell (RGC) differentiation. The direct bio-computational identification of transcription factor target sited is usually obscured by “noise” masking relevant motifs in complex genomes. We eliminated that noise applying a novel double phylogenetic filtering approach and identified a battery of genes directly controlled by Ath5 in vivo with an efficiency that very well compares to microarray studies. We show coexpression with and transactivation by Ath5 for a subset of the predicted target genes. Chromatin immuno-precipitation demonstrates the occupancy of the target gene promoters by Ath5 during retinal differentiation, unambiguously validating the in silico prediction in vivo. Thus our double filtering approach provides a highly efficient in vivo validated tool for the rapid in silico prediction of target gene batteries.

Dr. Jochen Wittbrodt is a group leader at EMBL. He has been studying the molecular mechanisms underlying eye development during vertebrate embryogenesis by using medaka and zebrafish as model animals. His group demonstrated the roles of many molecular players (transcription factors Rx, Six, and etc.) and signaling pathways in the fish eye development. His research group participated in a medaka mutant hunting, which was done in collaboration with Japanese medaka researchers. He has also been involved in inventing novel technologies, such as for transgenesis and bio-imaging.

Host: Masahiko Hibi
Vertebrate Axis Formation, CDB
hibi@cdb.riken.jp
Tel: 078-306-3134
(ext: 1402)