

SFB 680

MOLECULAR BASIS OF EVOLUTIONARY INNOVATIONS

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BMP Morphogen Signaling in Drosophila: From nuclear responses to extracellular regulation

Signaling by morphogen gradients is a key concept in animal development. In most cases, morphogens are secreted ligands that distribute in long-range concentration gradients and instruct cell fates directly and in a dose dependent manner. Despite their importance in tissue growth and patterning, how morphogen gradients are established and maintained and how cells respond to graded signaling remain poorly understood. I will present recent data from our studies on Drosophila BMP morphogen signaling that addresses both gradient interpretation and establishment.

Our efforts in understanding differential gene responses to graded BMP in the larval wing imaginal disc - a classical model of morphogen signaling - culminated in the identification of a simple molecular switch that directly implements signal-dependent transcriptional activation versus transcriptional repression. Importantly, the DNA motifs uncovered in this study can be exploited to detect BMP target genes in a genome-wide manner. I will give examples of *de novo* identified target genes of graded or inductive BMP signaling that help provide the molecular basis of reported BMP phenotypes or uncover novel biological functions of the pathway. I will also emphasize on a specific class of direct BMP morphogen targets that are employed in regulatory feed-back loops to equip the morphogen gradient with robustness and scaling properties. This last category of BMP targets underscores the tight connections between morphogen gradient formation and its cellular interpretation.

May 21, 2012 11:00 am

Institute for Genetics Str. 47a, Room Lecture Hall Ground Floor

Host: Siegfried Roth

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