



Institute colloquium

Making a flat leaf: Pre-patterns, small RNA morphogens, and Turing reactions

Marja Timmermans (University of Tübingen)

Host: Eva Benkova

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Development of flat leaf architecture poses an unusual and mechanistically challenging problem; namely, how to create a stable dorsoventral (top-bottom) boundary within the plane of a long and wide, but shallow, structure. The acquisition and maintenance of this polar axis involves an intricate gene regulatory network with several highly conserved transcription factors that promote either dorsal or ventral fate at its core. These are expressed in complementary domains delineating the top and bottom side of the initiating organ, respectively. The positional information needed to define these domains is provided in part by small RNAs that, reminiscent to classical morphogens, generate sharply defined domains of target gene expression through an intrinsic and direct threshold-based readout of their mobility gradients. While the polarity network is sufficient to cleanly separate regions of dorsal and ventral identity, our most recent findings from mathematical modeling predict that additional inputs are needed to maintain a robust, uniformly positioned developmental boundary. Interestingly, anisotropic growth is one such input. The maintenance of a stable dorsoventral boundary during primordium growth may thus rely on the anisotropic nature of that growth.

Monday, June 22, 2020 04:00pm - 05:00pm

IST Austria Campus Raiffeisen Lecture Hall, Central Building



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