MPI-NAT SEMINAR SERIES

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Diffusion-based gradient in epithelia: formation and spatial limits

In a first part of my presentation, I will review our evidence that signalling proteins can spread by diffusion in epithelia, contrasting Dpp, a soluble morphogen of the BMP class and Wingless, a Wnt, which is rendered insoluble by post-translational palmitoleoylation. I will briefly provide an overview of our published evidence and then dwell on recent unpublished results that highlight the role of glycosaminoglycan chains in planar diffusion of Wingless. In diffusion-based exponential gradients, the dwindling number of morphogen molecules far from the source is expected to constrain the useful range. I will describe a genetic circuit that counteracts this limitation in developing wings. I will show that this circuit, which involves Brinker-mediated feedback on pMad, boosts Dpp signalling at the distal end of the gradient without amplifying the signal near the source. I will then provide experimental and genomic evidence that this circuit is not operational in apterygotes and suggest that it specifically evolved in winged insect.

Thursday, 07.11.2024, 13:00 pm

Host: Jochen Rink / Melina Schuh

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