

Biology Seminar

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Understanding the temporal and spatial cellular dynamics of making a Left-Right Organizer

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Rab8, Rab11, and Rab35 coordinate lumen and cilia formation during zebrafish left-right organizer development

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Kupffer's Vesicle (KV): The ciliated zebrafish organ of asymmetry

Confocal maximum projection of the zebrafish organ of asymmetry known as Kupffer's Vesicle (KV) during the lumen stage. KV cells are marked using a Sox17: GFP-CAAX zebrafish line (inverted grey LUT) and cilia extending into the KV lumen are marked with an anti-acetylated tubulin antibody (16-color LUT).

Image credit: Julie Manikas and Heidi Hehnly

The Hehnly Lab investigates how cellular and intracellular mechanisms establish the Left-Right Organizer (LRO) in vertebrates, a critical structure for body axis formation. Using zebrafish as a model, the lab explores how motile and non-motile cilia within the LRO generate fluid flow or potentially sense it, impacting asymmetric organ development. Open questions include how cells differentiate to form motile versus non-motile cilia and the roles these cilia play in development. Through live imaging, gene expression profiling, and cytoskeletal analysis, the lab aims to reveal spatial and temporal cellular events essential for LRO maturation, ultimately informing models of ciliated tissue development.