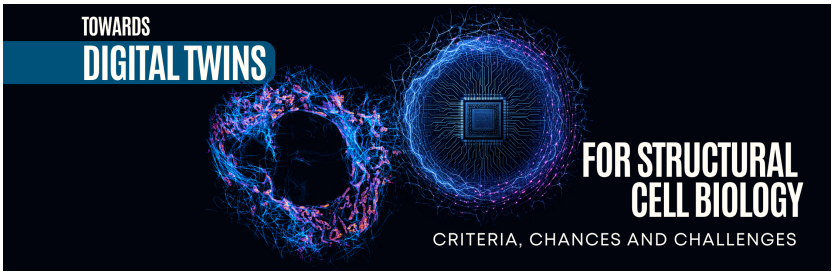

Contribution ID: **13** Type: **not specified**

Building a Virtual Embryo - A Single Cell At a Time.

Wednesday, 4 March 2026 16:45 (45 minutes)

Imagine having an interactive digital twin of a developing embryo —one you could pause, rewind, or zoom into, exploring how every cell divides, moves, and differentiates. To make this vision real, we created Zebrahub, a dynamic atlas of zebrafish embryogenesis that combines cutting-edge microscopy, powerful computational lineage tracking (Ultrack), and precise molecular mapping into an interactive resource. Our journey begins with advanced multiview light-sheet microscopy, capturing millions of cells in living zebrafish embryos over days of continuous development (DaXi). Next, our uncertainty-aware cell tracker, Ultrack, transforms these enormous terabyte-scale datasets into coherent cellular histories, reconstructing precise lineages even in challenging imaging conditions. Combining these detailed lineages to single-cell transcriptomes, Zebrahub enables users not only to visualize developmental events in unprecedented detail but also to explore the molecular decisions underlying them.

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Session Classification: Invited Talks