ASHBi SEMINAR

2026
March.4 WED
15:00-17:00

Registration

Venue Conference Room ◀◀◀ Onsite Only
B1F, Faculty of Medicine Bldg. B

Lecturer Nobu Hamazaki Ph.D.
Assistant Professor, University of Washington (UW)

Nozomu Yachie Ph.D.
Professor, University of British Columbia (UBC)

"Uncovering the human post-implantation embryonic development at scale"
Lecturer: **Nobu Hamazaki**, Ph.D.

Disruptions during human post-gastrulation development often result in severe pathologies, including anencephaly and cardiac malformations. Despite this clinical significance, research into this stage is severely restricted by the inability to access human in vivo embryos. We address this challenge using human pluripotent stem cell (hPSC)-derived embryo models. Specifically, we have established the RA-gastruloid and AP-gastruloid systems, which successfully mimic broad aspects of human embryogenesis in vitro. This presentation highlights our recent progress in utilizing these models to decode the regulatory logic of early human development. I will also discuss the potential of these systems to uncover the molecular foundations of developmental diseases.

"Capturing mammalian developmental trajectories"
Lecturer: **Nozomu Yachie**, PhD

Biological studies often require destroying samples to observe molecular and cellular details, which hampers our understanding of the dynamic progression of complex systems like mammalian development. To address this, my group is developing two complementary approaches: (1) an intracellular video-camera-like system and (2) a high-performance computing system to co-embed extremely large single-cell genomics data for the genome program and developmental cell trajectory inference. The first, called DNA event recording, stores molecular and cellular events over time in synthetic "DNA tapes" within cells' genomes. We are currently working to obtain the first high-resolution map of the mouse's whole-body development. The second approach hierarchically clusters hundreds of millions to billions of single cells to reconstruct developmental trajectories and model a virtual human cell. I will share our current progress in these three areas, aimed at capturing the spatiotemporal (4D) dynamics of mammalian development and disorders.

Organizer: Institute for the Advanced Study of Human Biology (WPI-ASHBi), Kyoto University

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