

BDR SEMINAR (Kobe & online hybrid)

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Monday, July 28, 2025

14:00-15:00

1F Auditorium, DB Building C, Kobe / Broadcast online via Zoom

Zoom meeting URL will be announced on the event day by e-mail.

※Non-BDR members: Please register from the following link.

<https://krs2.riken.jp/m/bdrseminarregistration> (Registration deadline: July 24)

What do we do with 5322 mammalian brain cell types?

Summary

A fundamental challenge in neuroscience is our limited understanding of the cellular composition of the human brain: the genes that define these cells, how they form functional circuits, their varying susceptibility to disease, and how they compare to cells in model organisms used in biomedical research. A key insight from single-cell genomics is that cell types are largely conserved across mammals—from mice to humans—with greater similarity generally following evolutionary closeness.

The Human and Mammalian Brain Cell Atlas (HMB) consortium is a US BRAIN Initiative-supported effort to create a comprehensive cell atlas of the human, macaque, and marmoset brain using high-throughput single-cell molecular, spatial, and phenotyping assays. This effort leverages single-cell transcriptomics, epigenomics, and spatial transcriptomics to classify and map cell types across the entire brain, guided by structural and functional imaging.

I will describe how we are generating cross-species alignments of homologous cell types in mice, marmosets, macaques, and humans to enable comparative analysis of cellular properties. All data are integrated into common coordinate frameworks, creating new atlases that combine structural, functional, cellular, and molecular information. The project – now at a midway point - makes its data, analyses, and visualization tools freely available to the research community, including a formal cross-species cell ontology to support broad scientific collaboration.