The 46th Global and Local Infectious Diseases Research Seminar

RCGLID
OITA UNIVERSITY

April 23rd , 2026
16:30-17:30

FREE
REGISTRATION ▶
https://x.gd/z8qHQ

Presenter : Kaisar Dauyey

Postdoctoral Researcher Hokkaido University

Venue: OITA Univ. RCGLID Meeting Room & Teams

This seminar will be held in English.

Application of AI and Machine Learning in Single-Cell RNA-Sequencing

Recent advances in single-cell RNA sequencing (scRNA-seq) have enabled unprecedented resolution in understanding cellular heterogeneity, but the complexity and scale of these datasets demand new analytical approaches. In this seminar, I will introduce how artificial intelligence (AI) and machine learning are transforming the analysis and interpretation of single-cell transcriptomic data.

A central focus will be on transformer-based foundation models, particularly Geneformer, which leverages large-scale transcriptomic data to learn biologically meaningful representations of gene expression. I will discuss how such models enable tasks including cell type classification, gene regulatory network inference, and perturbation prediction, often with minimal task-specific training.

The seminar will also cover key concepts such as embeddings, transfer learning (zero-shot and few-shot applications), and the integration of multi-modal biological data. Practical examples will be presented to illustrate how AI-driven approaches can uncover novel biological insights that are difficult to achieve with traditional methods.

Finally, I will discuss current limitations, challenges in model interpretability, and future directions for applying foundation models in biomedical research. This seminar is intended for researchers interested in computational biology, genomics, and the application of modern AI methods to complex biological systems.

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