BDR SEMINAR (Kobe & online hybrid)

Kotaro Fujii

The Department of Molecular Genetics & Microbiology, University of Florida

Thursday, October 16, 2025

14:00-15:00

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

※This seminar is open only for BDR Members

The Precision of Mistakes: Dynamic mRNA Translation Fidelity in Development and Disease

Summary

A key question in gene regulation is how information encoded in the genome is expressed with high fidelity and precision to enable cells to adapt to their environment. By developing the first transgenic mouse model monitoring mRNA translation errors in vivo, we delineated the first spatiotemporal landscape of mRNA translation fidelity, indicating brain and muscle tissues with the highest fidelity, which was gradually established across embryonic development. Using brain organoids, we further revealed a significant impact of increasing translation errors on neuron differentiation. We also discovered the regulatory principle of translation fidelity for each transcript through codon optimality. Given the impact of translation errors for protein homeostasis and immune activation through error-containing peptide presentation, we will further discuss the hidden roles of translation fidelity for human health.

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