Chemical & Physical Sciences
UNIVERSITY OF TORONTO
MISSISSAUGA

COLLOQUIUM SEMINAR SERIES

AMINOACYL-TRNA SYNTHETASES - GENETIC CODE INTERPRETATION AND BEYOND

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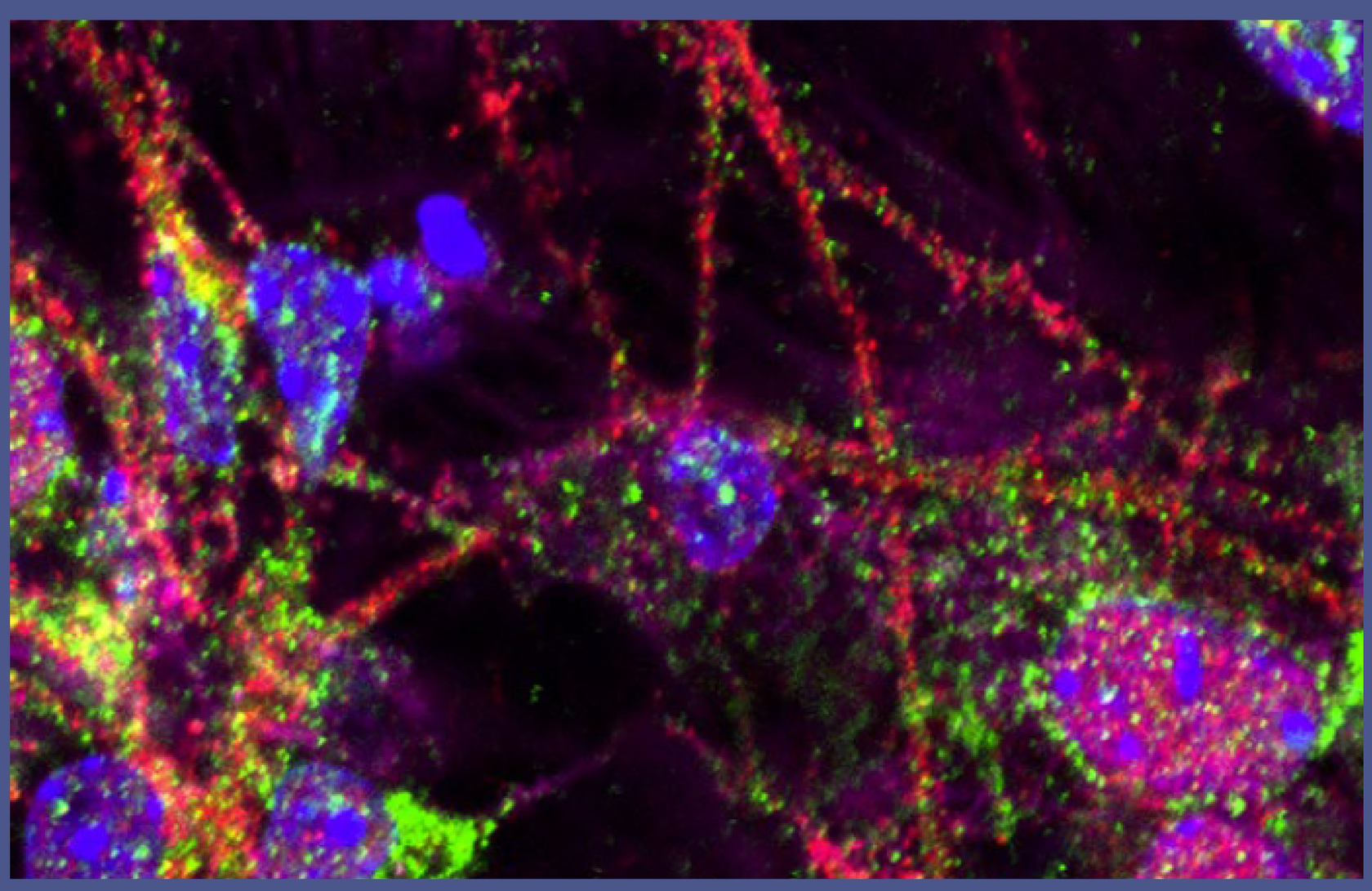

Translation of messenger RNA (mRNA) into proteins is central to all life and of high therapeutic relevance. Aminoacyl-tRNA synthetases assign the correct amino acid to transfer-RNA (tRNA), thereby linking the information encoded in nucleic acids to the building blocks for protein synthesis. I found that a protein complex formed by aminoacyl-tRNA synthetases does not support their enzymatic functions, but instead ensures correct localization within the mammalian cell, with possible relevance for neurodevelopmental disorders. Levels of an aminoacyl-tRNA synthetase in the cell nucleus are responsive to the metabolic modulation of its corresponding amino acid, which is reduced during disease states. In the cell nucleus, the aminoacyl-tRNA synthetase sequesters an mRNA processing factor that modulates nuclear compartmentalization. By hindering the mobility of its interaction partner, the aminoacyl-tRNA synthetase controls protein isoform preference and ultimately communication with immune cells during inflammation. Going forward, my group is going to explore how to visualize aminoacylation reactions in cells to investigate the spatial regulation of genetic code interpretation and to study the consequences of misplaced aminoacyl-tRNA synthetase on neurodevelopment. In addition, we are also further studying the mRNA processing factor that we identified as an interaction partner and the consequences of its mutations for human health.

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featuring

Dr. Haissi Cui

Wednesday, December 7, 2022 | 3:30pm

Location: CCT2150