THE GIS
SPEAKER SERIES

Genome Institute of Singapore
A*STAR GIS

Engineering RNA and RNP Functions to Program Cellular Behaviors

Professor Hirohide SAITO

Institute for Quantitative Biosciences, The University of Tokyo;
Center for iPS Cell Research and Application, Kyoto University

Host: Mile SIKIC

Monday, 5 October 2026
10am – 11am

GIS L2 – Seminar Room
60 Biopolis Street, Genome,
Singapore 138672

About The Speaker

Hirohide Saito is a Professor at the Institute for Quantitative Biosciences, The University of Tokyo, and is also affiliated with the Center for iPS Cell Research and Application, Kyoto University. His research focuses on RNA and RNA-protein (RNP) synthetic biology, with the goal of engineering functional RNA molecules that can precisely control gene expression, cellular behavior, and cell fate. His laboratory integrates molecular design, artificial intelligence, high-throughput screening, and experimental evolution to develop programmable RNA technologies. Recent work includes miRNA-responsive RNA switches for cell-selective regulation and purification, as well as AI-driven approaches for generating functional RNAs with programmable properties. These technologies are being explored as foundations for next-generation diagnostic, therapeutic, and regenerative applications.

About The Seminar

RNA molecules and RNA-protein (RNP) complexes play central roles in gene regulation, cellular identity, and disease, creating opportunities to engineer these systems for research and therapeutic applications. In this seminar, Prof Saito will present his efforts to develop synthetic RNA technologies that use endogenous cellular information for precise and programmable control of gene expression. He will discuss miRNA-responsive OFF and ON switches that enable selective regulation of translation, purification of target cell populations, elimination of unwanted cells, and control of transgene expression. He will also describe his recent efforts to integrate AI-driven RNA design, high-throughput screening, and evolutionary engineering to generate functional RNA molecules with programmable properties. By combining these approaches with RNA-based cellular engineering, he aims to develop new strategies for controlling cell fate, inducing cellular reprogramming, and creating next-generation therapeutic platforms.