NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

# ON-SITE BIOLOGY COLLOQUIUM

Friday, 15 May 2026 | 4 pm | S3 05-02 Conference Room 1

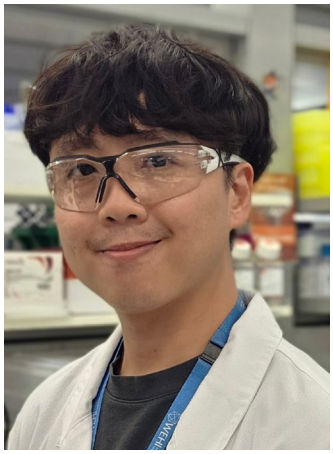
Hosted by Assist. Prof Phua Siew Cheng

Map to Block S3

# Defining the human E3-ome in biology and disease


## Ngee Kiat (Jake) Chua

*Walter and Eliza Hall Institute of Medical Research*


The ubiquitin system is a central regulator of cellular life, controlling processes ranging from protein homeostasis to inflammation and immune signaling. At its core are E3 ubiquitin ligases, which confer substrate specificity and determine the fate of thousands of proteins. These enzymes are increasingly implicated in major human diseases, including cancer, neurodegeneration, and inflammatory disorders, and are emerging as key enablers of therapeutic strategies such as targeted protein degradation.

Despite their importance, the E3 ligase landscape has remained fragmented, with inconsistent definitions and incomplete annotation. Here, I present the E3-ome, a comprehensive, gene-centric compendium defining 672 human E3 ubiquitin ligases within a unified framework. This work resolves longstanding discordance across the field, consolidates disparate annotations into a high-confidence reference set, and identifies previously unrecognized E3 components and candidate ligases.

Systematic classification across E3 families reveals their organizational logic and enables comparison of molecular features, while integration of expression and genetic variation highlights context-dependent regulation and links to disease. The E3-ome provides a foundational resource for prioritizing therapeutic targets and advancing ubiquitin-based drug discovery.


***About the Speaker***

*Dr Ngee Kiat (Jake) Chua is a postdoctoral researcher at the Walter and Eliza Hall Institute of Medical Research (WEHI) and an EH Flack Fellow, with over a decade of experience in ubiquitin biology. He completed his PhD at UNSW Sydney with Andrew Brown and undertook postdoctoral training at WEHI with Rebecca Feltham. His research spans protein quality control and lipid metabolism and now focuses on non-degradative ubiquitin signaling in immune pathways. He has led efforts to define the human E3 ubiquitin ligase landscape, culminating in the E3-ome, a comprehensive framework of human E3 ligases published in Cell. He has also contributed to multidisciplinary studies across cell biology, biochemistry, and structural biology. Beyond research, he is active in science communication, with work featured on platforms such as ASBMB, and has led diversity and inclusion initiatives at WEHI.*