NUS National University of Singapore

Department of Biological Sciences
Faculty of Science

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Tues, 7 Jan 2025 | 10 am | S1A 02-17 Seminar Room

Hosted by Assist. Prof Lin Zhewang

Membrane fusion: from viral infection to fertilization

By **Steven Shaogeng Tang**
Yale University

The Steven Tang lab studies membrane fusion and its inhibition. Membrane fusion of sperm and eggs is pivotal in sexual reproduction. Tmem95 knockout mice produce sperm that can bind to, but do not fuse with, eggs. How TMEM95 facilitates membrane fusion was unknown. We showed that human TMEM95 binds eggs. Our crystal structure of TMEM95 suggested a region where this binding may occur. We developed monoclonal antibodies against TMEM95 that impair sperm-egg fusion but do not block sperm-egg binding. Thus, we proposed that there is a receptor-mediated interaction of sperm TMEM95 with eggs, and that this interaction may have a direct role in membrane fusion. Our work suggested avenues for the identification of the TMEM95 egg receptor and the development of infertility treatments and contraceptives for humans.

About the Speaker

Steven Tang is an Assistant Professor in the Department of Molecular Biophysics and Biochemistry at Yale University. The Tang lab is interested in decoding and rewiring the cell-surface interactomes of cell-cell fusion and signaling, using protein engineering, structural biology, immunology, and cell biology. Supported by an NIH K99/R00 award, Steven's research has focused on cell-surface recognition and sperm-egg membrane fusion in mammalian fertilization. The long-term goal of his lab is to establish the design principles of cell-cell fusion and to inform therapeutic strategies for regenerative medicine and infectious diseases. Before arriving at Yale in 2023, Steven was a Merck Fellow of the Damon Runyon Cancer Research Foundation with Prof. Peter Kim at Stanford University. Previously, Steven completed his Ph.D with Prof. Scott Emr at Cornell University and his B.S. at Peking University.