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

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SEMINAR

Tues, 11 August 2026 | 4 pm | S3-05-02 Conference Room 1

Hosted by Assoc Prof Liou Yih-Cherng

Molecular Physiology of Lysosomes

Haoxing Xu

Professor,
Qiushi and K.C. Wong Chair Professor, Dean of the School of Basic Medical Sciences, Zhejiang University, China

Dr. Haoxing Xu received his B.Sc. from Peking University, Ph.D. from Georgia State University, and completed postdoctoral training at Boston Children's Hospital, Harvard Medical School. He joined the University of Michigan in 2007, where he became Full Professor, and is currently Qiushi and K.C. Wong Chair Professor, Dean of the School of Basic Medical Sciences at Zhejiang University, a New Cornerstone Investigator, and an AIMBE Fellow.

Dr. Xu is an internationally recognized pioneer in organelle ion channel and lysosomal electrophysiology research. He has discovered 12 previously unknown ion channels, including eight lysosomal ion channels, and published over 90 papers in Nature, Cell, and Science. With an H-index of 70 and over 30,000 citations, he is a Clarivate Highly Cited Researcher and recipient of the U.S. Presidential Early Career Award for Scientists and Engineers (PECASE) and the Sloan Research Fellowship.

Dr. Xu serves as Executive Director of the Biophysical Society of China and Chairman of the Zhejiang Neuroscience Society, and has co-founded biotechnology companies in both China and the United States.

More than 50 human diseases collectively called lysosome storage diseases (LSDs) are the result of problems in trafficking to, degradation within, or export from lysosomes. Emerging evidence suggests that common neurodegenerative diseases such as Alzheimer's disease (AD) and Parkinson's disease (PD) are also lysosomal (dysfunction) disorders. In response to cellular cues in the endocytic and autophagic pathways, lysosomes use H+ flux to establish the working environment for hydrolases, H+, Na+, K+, and Cl+ fluxes to establish the lysosomal membrane potential essential for driving catabolite export, and Ca2+ and H+ channels to carry the signals needed for precise delivery of cargo and hydrolases, as well as timely removal of catabolites.

Dr. Xu has developed a unique research program for understanding the cell biology of lysosomes, and its relationship to lysosomal storage disorders and common neurodegenerative diseases such as AD and PD. This program combines electrophysiological and imaging approaches typically used to study plasma membrane ion channels with molecular and biochemical approaches typically used to understand organelle function. The combined approach has allowed his lab to find eight lysosomal ion channels (Ca^{2+}, Na^{+}, K^{+}, $Fe2^{+}/Zn2^{+}$, Cl^{-}, and H^{+}) and identify the activating cellular cue for each of them. With his unique and combined expertise in both organellar electrophysiology and chemical cell biology, Dr. Xu's work may not only reveal at the molecular level how information exchange occurs rapidly between the lysosomal lumen and cytosol, but also lead to new therapeutic approaches to treating lysosomal diseases.