



**Youxing Jiang, Ph.D.**

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Seminar Title:

Structural Mechanisms of Selectivity and Gating of Mitochondrial Calcium Uniporter

Abstract:

Mitochondria can take up large amounts of  $\text{Ca}^{2+}$  from their environment, a process that can modulate ATP production, alter cytoplasmic  $\text{Ca}^{2+}$  dynamics, and trigger cell death.  $\text{Ca}^{2+}$  enters the mitochondrial matrix through the mitochondrial calcium uniporter, a highly selective  $\text{Ca}^{2+}$  channel that is localized to the inner mitochondrial membrane. In humans, the uniporter is a protein complex or uniplex consisting of at least four components: the ion conducting pore MCU, the essential membrane spanning subunit EMRE, and the  $\text{Ca}^{2+}$ -sensing gate-keeping proteins MICU1 and MICU2. While MCU is found in all major eukaryotic taxa, EMRE is metazoan-specific and is required for the conductivity of MCU in these organisms. On the contrary, the pore-forming MCU is the only component of the uniporter in most fungi based on genome sequence analysis and likely represents the minimal channel component of the uniporter for  $\text{Ca}^{2+}$  uptake. My lab aims to address the fundamental questions about the uniporter's assembly, gating, and ion permeation properties by determining the structure of the uniporter, focusing first on the MCU component and then, ultimately, the uniplex.

Biography:

Dr. Youxing Jiang is professor of physiology, Rosewood Corporation Chair in Biomedical Science and W.W. Caruth, Jr. Scholar in Biomedical Research at The University of Texas Southwestern Medical Center (UT Southwestern) in Dallas. In 2008, Dr. Jiang became an investigator of the Howard Hughes Medical Institute. He received his Bachelor of Science degree in 1992 from Peking University and his Ph.D. in chemistry from Yale University in 1997. Dr. Jiang completed his postdoctoral training at Rockefeller University with Nobel Laureate Dr. Roderick Mackinnon, during which time he was at the forefront of groundbreaking research in the ion channel field. In 2003, Dr. Jiang was recruited to the Department of Physiology at UT Southwestern to launch his independent research program. Dr. Jiang was promoted to associate professor with tenure in 2008 and full professor in 2012. Dr. Jiang is a recipient of the Searle Scholar Award, the David and Lucile Packard Fellowship, and the Edith and Peter O'Donnell Award.