

SMS Fall 2024 O’Keeffe Lecture Seminar

October 18, 2024 | 3pm | PSF-166

“Type IA Topoisomerases – Universal Regulator of DNA/RNA Topology”

Topoisomerases prevent impediments to vital cellular processes from suboptimal supercoiling of double-stranded DNA, and untangle topological barriers generated as replication or recombination intermediates. The subfamily of type IA topoisomerases are the only topoisomerases that can alter the interlinking of both DNA and RNA. Type IA topoisomerase subfamily includes bacterial topoisomerase I enzymes that are essential for the viability of many bacterial pathogens such as *Mycobacterium tuberculosis*. I will present our research on the structure, function and mechanism of bacterial topoisomerase I. The knowledge is being applied in virtual, enzyme-based and bacterial cell-based screening assays to identify inhibitors against this novel target for the discovery of much needed new antibiotics.

Yuk-Ching Tse-Dinh, PhD

Distinguished University Professor

Department of Chemistry and Biochemistry

Florida International University

Prof. Yuk-Ching Tse-Dinh currently holds the position of Distinguished University Professor at the Department of Chemistry and Biochemistry of Florida International University, the public research university in Miami that is among the top 10 largest universities in the nation. Born in Hong Kong, her college education in the United States was funded by the International Institute of Education. She obtained a Ph.D. in Biological Chemistry from Harvard University in 1982, studying under Professor James C. Wang, the discoverer of topoisomerases as enzymes that can control the intertwining of DNA strands and maintain the genome topological state required for essential cellular functions. Her dissertation work included the identification of tyrosine as the catalytic residue responsible for cutting and rejoining of DNA by topoisomerases. After earning her Ph.D., Dr. Tse-Dinh immediately became a principal investigator in the Central Research and Development arm of the chemical company DuPont, where she spent six years in basic discovery research before returning to academia, rising through the ranks to Full Professor at New York Medical College.

She joined Florida International University in 2012 as the Founding Director of the Biomolecular Sciences Institute, a consortium created to facilitate interdisciplinary collaboration among the over 50 faculty members across multiple FIU colleges. She then established the Translational Molecular Discoveries program, an Emerging Preeminent Program at FIU that integrates the basic and translational research efforts of faculty across disciplines for discovery of new therapy and predictive biomarkers. She also initiated an NIH-funded T32 predoctoral training program in Transdisciplinary Biomolecular and Biomedical Sciences at FIU. Her research funded by government, industry, and philanthropy investigates the structure, mechanism and function of DNA topoisomerases as the basis of discovery for drug leads to treat cancers and infectious diseases. She is the inventor of multiple patents on novel small molecule inhibitors with antibacterial or anticancer activity. She served continuously for more than 30 years on numerous NIH grant review panels. She is a member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL).

