Keynote Speaker: Jackie Y. Ying
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Biography

Prof. Jackie Ying was Professor of Chemical Engineering at MIT (1992-2005), Founding Executive Director of Institute of Bioengineering and Nanotechnology, Singapore (2003-2018), and Director of A*STAR's NanoBio Lab (2018-2023). She is currently Chair of the Department of Bioengineering and Nanomedicine of King Faisal Specialist Hospital & Research Centre. Her interdisciplinary research in nanomaterials and nanosystems is directed towards applications ranging from battery and fuel cells, catalysis and green chemistry, nanomedicine and targeted delivery of drugs, cell culture substrates and biomaterials, *in vitro* toxicology and drug screening, to biosensors and diagnostics.

Prof. Ying has received numerous awards, including ACerS Purdy Award, David and Lucile Packard Fellowship, ONR Young Investigator Award, NSF Young Investigator Award, Dreyfus Teacher-Scholar Award, ACS Solid-State Chemistry Award, *Technology Review*'s TR100 Young Innovator Award, AIChE Colburn Award, and World Economic Forum Young Global Leader, IUBMB Jubilee Medal, Mustafa Prize, Turkish Academy of Sciences Academy Prize in Science and Engineering Sciences, Lifetime Achievement Award of *Journal of Drug Targeting*, and King Faisal Prize in Science. She is elected to the German National Academy of Sciences - Leopoldina, U.S. National Academy of Inventors, and U.S. National Academy of Engineering. She is a Fellow of MRS, RSC, AIMBE, and AAAS. She is recently granted with Saudi Arabia citizenship by royal decree.

Prof. Ying was the Founding Editor-in-Chief of *Nano Today*. She serves on the Board of Trustees of Princeton University, and Board of Directors of Saudi Arabia's Research, Development and Innovation Authority. She has authored 390 journal articles (*h* index: 106, 51,500 citations), and 200 primary patents (42 of which have been licensed). She has served on the Board of Directors and/or Advisory Boards of 10 start-up companies and 2 venture capital funds. One of the spin-off companies that she co-founded, SmartCells, Inc., has developed a technology platform that is capable of auto-regulating the release of insulin

therapeutic depending on the blood glucose levels. Merck acquired SmartCells, Inc. in 2010, with milestone-based aggregate payments in excess of US$500 million to further develop this nanomedicine for clinical trials. Prof. Ying also co-founded Curiox Biosystems, which successfully miniaturized high-content drug screening assay in the form of droplet microarray. Curiox went IPO on KOSDAQ in 2023.

Title of Keynote Lecture:
Design and Synthesis of Nanomaterials for Biomedical and Energy Applications

Abstract:

Nanostructured materials can be designed with sophisticated features to fulfill the complex requirements of advanced material applications. Our laboratory has developed organic and inorganic nanoparticles and nanocomposites for advanced drug delivery, antimicrobial, stem cell culture, and tissue engineering applications. In addition, we have nanofabricated microfluidic systems for drug screening, *in vitro* toxicology, and diagnostic applications. The nanosystems allow for the rapid and automated processing of drug candidates and clinical samples in tiny volumes, greatly facilitating drug testing, genotyping assays, infectious disease detection, point-of-care monitoring, as well as cancer diagnosis and prognosis.

We have also synthesized metallic, metal oxide and semiconducting nanoclusters, nanocrystals and nanosheets of controlled dimensions and morphology. The nano-sized building blocks are used to create multifunctional systems with excellent dispersion and unique properties. Nanoporous materials of a variety of metal oxide and organic backbone have also been created with high surface areas and well-defined porosities. These nanostructured materials are successfully tailored towards energy and sustainability applications.