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CICLO DE CONFERENCIAS

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Salón de Actos, Edificio D

QUÍMICA ANALÍTICA UCM

DISCOVERY AND TRANSLATION OF THE CELL MEMBRANE COATING NANOTECHNOLOGY

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About the Speaker

Dr. Liangfang Zhang is the Joan and Irwin Jacobs Chancellor Professor and Chair of the Aiiso Yufeng Li Family Department of Chemical and Nano Engineering at the University of California San Diego. Dr. Zhang received his B.E. and M.S. degrees in Chemical Engineering from Tsinghua University and completed his Ph.D. in Chemical & Biomolecular Engineering at the University of Illinois at Urbana-Champaign in 2006 under the mentorship of Prof. Steve Granick. He was a postdoctoral associate in the laboratory of Prof. Robert Langer at MIT from 2006 to 2008. Dr. Zhang joined the Department of Nanoengineering at UC San Diego as an Assistant Professor in 2008, was promoted to Professor in 2014, and became the inaugural Joan and Irwin Jacobs Chancellor's Endowed Chair in Innovations for Engineering in Medicine in 2021. In 2023, he was appointed as Chair of his department, which was renamed and endowed as the Aiiso Yufeng Li Family Department of Chemical and Nano Engineering in 2024. His research focuses on creating innovative biomimetic nanotechnologies for biomedical applications such as countermeasures, drug delivery, vaccines, and diagnostics. He has authored 310 peer-reviewed publications and was recognized as a Clarivate Analytics "Highly Cited Researcher" from 2017 to 2023. Additionally, he holds 135 patents and patent applications worldwide. Dr. Zhang is a Fellow of the American Institute for Medical and Biological Engineering (AIMBE, elected 2015), the American Association for the Advancement of Science (AAAS, elected 2018), and the National Academy of Inventors (NAI, elected 2020). http: //nano.ucsd.edu/~l7zhang/

About his conference

In this talk, he will report on the research discovery and translational progress of the cell membrane coating nanotechnology. By cloaking synthetic nanoparticle cores with the natural plasma membranes of human cells (e.g., RBC, platelet, WBC, cancer cell, etc.), the resulting cell membrane-coated nanoparticles (denoted "CNPs") are demonstrated to possess many surface functions of natural cells. These biological functions include the evasion of the immune system, specific binding with target tissues or cells, and specific interaction with harmful biological agents such as bacterial toxins and viruses. Such multifaceted cell-mimicking interfacial properties are attributed to the presence of cell membrane on nanoparticle surface, which contain a myriad of membrane proteins, lipids, and their associated functions. Besides the use of wild-type cell membranes, CNPs can also be fabricated using genetically engineered cell membranes. By expressing desirable functional proteins on the plasma membrane of source cells, the resulting CNPs can achieve a wide range of therapeutic and drug delivery goals.