



Bioinspired Drug Delivery Cells and Devices



Zhen Gu, Ph.D.

Distinguished Chair Professor and Associate Vice President,
Zhejiang University

Director, National Key Laboratory of Advanced Drug Delivery and
Release Systems

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Time : 11:30 am

Venue : Room 1122, William M W Mong Engineering Building, CUHK

Abstract

We have long been interested in the design and delivery of intelligent therapeutics based on bioinspired strategies, particularly through engineered cells and cell-inspired systems. The precise regulation achieved by genetic circuits and mechanical/electronic devices often provides inspiration and stimulates new imagination. In this lecture, I will introduce our lab's recent innovations and translational efforts in intelligent drug delivery systems that can be triggered by disease-associated physiological and pathological signals. First, I will present biomimetic platforms based on cell-drug conjugates, including platelet-drug conjugate and mast cell-mediated delivery technique for targeted cancer therapy, and cell- /tissue-based drug release systems enabled by "cryogenic inactivation" strategies. In addition, I will discuss progress in glucose-responsive smart insulin and related controlled-release devices, as well as our recent advances in the development of long-acting drug delivery formulations and device-integrated platform technologies. I will also highlight AI technologies for augmenting performance of drug delivery devices.

Biography

Dr. Zhen Gu is Qiushi Distinguished Chair Professor and Associate Vice President at Zhejiang University. He also serves as the Director of the National Key Laboratory of Advanced Drug Delivery and Release Systems, and Deputy Director of the Drug Delivery Committee of Chinese Pharmaceutical Association. Dr. Gu was elected to the College of Fellows of the Controlled Release Society (CRS, 2025), Chinese Society for Biomaterials (CSB, 2025), Chinese Biomaterials Academic Advisory Committee of Chinese Academy of Medical Sciences (CAMS, 2024), International Academy of Medical and Biological Engineering (IAMBE, 2021) and American Institute for Medical and Biological Engineering (AIMBE, 2019). Dr. Gu received his B.S. degree in Chemistry and M.S. degree in Polymer Chemistry and Physics from Nanjing University. In 2010, he obtained Ph.D. from the Department of Chemical and Biomolecular Engineering at the University of California, Los Angeles (UCLA). He was a Postdoctoral Associate working with Dr. Robert Langer at MIT and Harvard Medical School. Before he moved to Zhejiang University in 2020, he was a Full Professor in the Department of Bioengineering and Director of the NIH Biotechnology Training in Biomedical Sciences and Engineering Program at UCLA. From 2012 to 2018, he was working in the Joint Department of Biomedical Engineering at the University of North Carolina at Chapel Hill and North Carolina State University, where he had been appointed as a Jackson Family Distinguished

Professor. Dr. Gu's group studies controlled drug delivery, biomaterials, drug delivery devices, and cell therapy. As a lead contact, he has published over 300 research papers in high-profile journals, including *Cell* and *Nature*. He has also applied over 200 patents (issued: 75) that have been licensed to over 10 companies. He is the recipient of the National Innovation Competition Award (2026), National Natural Science Award (second place) in China (2024), Felix Franks Medal of the Royal Society of Chemistry (2020), Young Investigator Award of Controlled Release Society (2017), Sloan Research Fellowship (2016), Pathway Award of the American Diabetes Association (2015), and MIT Technology Review TR35 (35 Innovators under 35) award (2015). His major inventions include glucose-responsive insulin, transdermal microneedle patch and platelet-drug conjugate, which are under clinical trials. He serves as the Executive Editor of *Engineering* and Associate Editor of *Biomaterials*, *Nano Research*, and *Regenerative Biomaterials*.

***** ALL ARE WELCOME *****

For enquiries, please contact Ms. Joyce Chan, Department of Biomedical Engineering at 3943 8278