Polymer Seminar

11:15 am, December 5, 2025

Science 1 - room 1002

Host: Yi Zhang

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Binbin Ying

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Soft Medical Devices for Hard Health Problems in Extreme Body Environments

Abstract: Advances in engineering have enabled a new generation of soft medical robots and devices with unique theranostic capabilities for interfacing with delicate organs. However, challenges remain in achieving spatial and temporal precision in extreme body environments, particularly within the digestive system. This talk will highlight three recent preclinical innovations addressing these challenges: (i) **BIO-SENTER**: a bioinspired soft enteroscopic robot for locomotion, steering, and intervention in the deep small intestine. (ii) **IngRI**: an ingestible, battery-free, tissue-adhering robotic interface for prolonged gut electrostimulation. (iii) **e-GLUE**: an electroadhesive hydrogel interface for enhanced mucosal retention of ingestible devices. These platforms demonstrate significant potential for managing chronic digestive conditions and beyond.

Bio: Binbin Ying is a tenure-track Assistant Professor in the Department of Biomedical Engineering with a secondary appointment in the Division of Digestive and Liver Diseases, Department of Internal Medicine, at UT Southwestern Medical Center. Binbin received his Ph.D. in Mechanical Engineering from McGill University in 2021 and conducted research as a visiting Ph.D. scientist at the University of Toronto from 2018 to 2021. Before joining UT Southwestern, he was a Banting Postdoctoral Fellow in the laboratories of Professors Giovanni Traverso and Robert Langer at the Massachusetts Institute of Technology and Brigham and Women's Hospital.

Binbin's research focuses on the development and clinical translation of soft medical devices to address critical unmet challenges in human health. He has authored more than 20 scientific publications, including over 10 first-author papers in leading journals such as *Science Translational Medicine, Nature Communications,* and *Nature Reviews Materials*, and holds several granted and pending patents. His work has been recognized with numerous honors, including the Banting Postdoctoral Fellowship, the NSERC Postdoctoral Fellowship, and the Chinese Government Award for Outstanding Self-Financed Students Abroad.

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