

## Multifunctional adhesive hydrogel platform for biomedical application

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**Date : 29 December 2025 (Monday)**

**Time : 11:00 – 12:00**

**Venue : P4704, 4/F, Yeung Kin Man Academic Building, CityUHK**

### Abstract

Implantable medical devices and tissue–device interfaces often fail due to poor adhesion, mechanical mismatch, and fibrotic encapsulation. This talk introduces a new class of bio-adaptive adhesive and anti-fibrotic interfaces designed to establish stable, long-term integration with wet and dynamic organs. By combining soft hydrogel adhesion chemistry, immune-informed material design, and organ-specific mechanobiology, these interfaces create rapid covalent bonding while actively preventing fibrosis across the gastrointestinal tract, peripheral nerves, cardiac tissues, and other organs. This platform enables long-term sensing, stimulation, drug delivery, and therapeutic modulation without sutures or rigid fixation, addressing long-standing challenges in biomedical implants and soft bioelectronics. Together, these advances point toward a generalizable strategy for creating fibrosis-free, mechanically compliant, and biologically harmonious medical technologies, opening new opportunities for organ repair, neuromodulation, and regenerative therapies.

### Biography



Dr. Jingjing Wu is a research scientist at Massachusetts Institute of Technology (MIT) with the department of Mechanical Engineering. Dr. Wu received her Ph.D. training at Huazhong University of Science and Technology (China) and the University of Erlangen-Nuremberg (Germany). She then joined MIT (United States) as a postdoctoral associate and has been serving as a research scientist since 2024.

Her research interests focus on the field of (1) fundamental mechanical and biological interactions between biomaterials and biological tissues, especially bioadhesion-driven suppression of fibrotic encapsulation of tissue–implant interfaces; and (2) development of novel soft materials with focus on (i) repair, healing and regeneration of injured tissues; and (ii) long-term functional interfacing between materials and the human body. Dr. Wu has authored and co-authored over 20 peer-reviewed journal articles, including high-impact papers in *Nature*, *Nature Biomedical Engineering*, *Science Translational Medicine*, and *Nature Materials*, and her work has garnered more than 3,500 citations.

Dr. Wu is currently serving as the guest editor of *Frontiers in Bioengineering and Biotechnology*, *Bioengineering* (special issue: Bio-applications of soft materials), review editor in *Tissue Engineering and Regenerative Medicine*, Co-Chair for several international conferences' sessions including 2022 MRS Fall Meeting of symposium SB09, and 2024 world congress-TERMIS for students and young investigators section, and reviewer for more than 10 prestigious journals including *Nature Communication*, *Advanced Functional Materials* and *ACS Nano*, etc.

Dr. Wu is the recipient of many prestigious international awards, including MRS Postdoc Award, Baxter Young Investigator Award (First Tier winner), Rising Stars in Soft and Biological Matter Symposium and Acta Student Award.

### Enquiries:

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All are welcome!