Faculty of Science

Dayong Jing Student Fellowship

IBMD Research Projects Available – 2025 Summer Round

- Energy Migration in Lanthanide Nanomaterials for Photonic Applications
- Develop Nanothermometers to Unlock Secrets in Living Cells
- Fluorescent Polymer-based Nanothermometer for Intracellular Sensing
- Microfluidic droplet technology for high-throughput cell encapsulation and sorting
- Exploring the fundamental influence of nanocrystal size in modulating upconversion and downconversion luminescence
- Tracking SARS-CoV-2 virus spikes within lung cells
- Oligo-based biosensors for quantification of cancer-associated microRNAs
- AI-Enhanced Organelles Segmentation and Organelle Interaction Network Analysis

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IBMD Project Supervisors

Professor Jiajia Zhou

Prof. Jiajia Zhou is an internationally recognised leader in single particle spectroscopy at the University of Technology Sydney (UTS), where her work focuses on making nanoparticles even smaller while preserving their useful optical properties for applications in biomedical sensing, imaging, display technology, and security inks. A recipient of major awards and grants such as the prestigious David Syme Research Prize, ARC Future Fellowship and NHMIC Investigator Grant, Prof. Zhou has driven innovations in rapid COVID-19 testing and protein detection and she has published extensively in high-impact journals including Nature and Nature Photonics.

Dr. Guocheng Fang

Dr. Guocheng Fang is a Cancer Institute Early Career Fellow at the School of Biomedical Engineering, University of Technology Sydney (UTS). He is also a visiting Fellow at the Institute for Biomedical Materials and Devices (IBMD), School of Mathematical and Physical Sciences. Prior to joining UTS, he was a Presidential Postdoctoral Fellow (PPF) at the Nanyang Technological University, Singapore (2022-2024). Dr. Fang envisions harnessing engineering innovations to address critical medical and clinical challenges, ultimately advancing human health and well-being. Currently, his research focuses on intelligent organoid-on-chip systems, aiming to establish reliable and responsive platforms for disease modeling, drug screening, and man–machine interfacing.

Dr Yuyang Gu

Dr. Yuyang Gu is a Postdoctoral Research Fellow at the University of Technology Sydney (UTS) and an incoming ARC DECRA Fellow (2025). His research bridges chemistry, nanophotonics, and super-resolution imaging, with a focus on lanthanide-based nanomaterials for advanced biophotonics. After earning his Ph.D. in Chemistry from Fudan University and completing postdoctoral training at the National University of Singapore, he has published over 20 papers in leading journals such as Nature Photonics and ACS Nano. He now leads projects using nanomaterials and nanochips to drive breakthroughs in imaging and intracellular biology.

Dr Yee Yee Khine

Dr Khine is a Postdoctoral Research Associate in the School of Mathematical and Physical Sciences at the University of Technology Sydney (UTS) and a core member of the Institute for Biomedical Materials and Devices (IBMD). She holds an MEngSc in Chemical Engineering (2014), an MSc in Chemistry by Research (2016), and a PhD in Polymer Chemistry (2021) from the UNSW, where she received the University International Postgraduate Award. She has conducted research at UNSW (Australia), Indiana University (USA), and the Karlsruhe Institute of Technology (Germany), and has collaborated extensively with industry partners worldwide. Her expertise lies in the design and development of polymeric materials for biomedical applications, with a current focus on engineering polymer-based nanothermometers for intracellular temperature sensing.

Dr Ajaykumar M P

Dr. Ajaykumar M P is a Postdoctoral Research Associate working with Prof. Jiajia Zhou at the Institute for Biomedical Materials and Devices (IBMD), School of Mathematical and Physical Sciences, at the University of Technology Sydney. His research focuses on the design and characterisation of lanthanide doped nanocrystals for photon bunching measurements. Prior to joining UTS, he was a research fellow at the Indian Institute of Science Education and Research (IISER) Thiruvananthapuram, India. He received his PhD in chemistry from IISER Thiruvananthapuram in 2024.

Dr Martin Sadraeian

Dr Martin (Mohammad) Sadraeian is a core member of the Institute for Biomedical Materials and Devices (IBMD). Dr. Sadraeian completed his PhD in Biomolecular Physics with key contributions on Anti-HIV immunoconjugates. As a postdoc researcher, he conducted projects on anti-viral photo-immunotherapy and virus photoinactivation. He is already working on photo-diagnostics for detection of miRNA and viral RNA. The major interest of the Sadraeian's project is the bio-molecule manipulation, including the designing and production of novel synthetic RNA and DNA molecules, and conjugating them with antibodies and upconverting nanoparticles (UCNP). The final products will be biosensors for photo-diagnostics of cancer or virus infection.

Dr Le (Leo) Zhang

Dr Zhang serves as a Postdoctoral Research Fellow at UTS and plays a pivotal role as a core member of the UTS Institute for Biomedical Materials and Devices (IBMD). He completed his PhD in Biomedical and Microbiology at UTS in 2021, under the guidance of Distinguished Professor Dayong Jin. Emerging as an international leader in antimicrobial resistance (AMR), his primary focus lies in exploring the mechanisms behind bacterial evolution of antibiotic resistance through a variety of interdisciplinary approaches. These methods include single-molecule microscopy, whole-genome sequencing, and global transcription analysis. Dr Zhang's groundbreaking work involves the integration of photonics and advanced materials into molecular biology, significantly contributing to the understanding of AMR. His research has yielded 19 journal publications, featuring in prestigious outlets such as Nature Methods, eLife, and Analytical Chemistry.