Yutong (Irina) Zhu

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🌐 `https://yutong-zhu.github.io/` 📇 Baltimore, MD, USA

Education

Baltimore, MD, USA Sep 2022 – Apr 2024	**M.S.E. in Chemical and Biomolecular Engineering**, Johns Hopkins University *Essay-Based Track*
Toronto, ON, Canada Sep 2017 – Apr 2022	**B.A.Sc. in Engineering Science**, University of Toronto *Biomedical Systems Engineering Major* *Engineering Business Minor*

Research Experience

Toronto, ON, Canada
Sep 2021 – Apr 2022

Institute of Biomedical Engineering, University of Toronto | Research Assistant
Supervised by Prof. Eli Sone, Biological and Bioinspired Materials Laboratory

- Investigated adhesive protein mechanisms through analysis of zebra mussel protein localization and post-translational modification (PTM) of quagga mussel proteins.
- Extracted fresh proteins from freshwater mussels' phenol glands, bulk plaques, threads and footprints.
- Designed and characterized chemical buffers for protein extraction, purification and storage.
- Performed SDS-PAGE for protein separation and gel imaging through staining with different approaches that achieve distinct objectives.
- Utilized high-performance liquid chromatography (HPLC) to achieve protein purification.

Toronto, ON, Canada
Jan 2021 – Sep 2021

Institute of Biomedical Engineering, University of Toronto | Research Assistant
Supervised by Prof. Michael Garton, Synthetic Biology Laboratory

- Designed and developed a library of landing pad Hek293T cell lines for AAVS1 and pSH231 safe harbour sites for exchange of expression cassettes.
- Evaluated existing cassette exchange methods and conducted literature review for improvements and modifications.
- Performed synthetic biology techniques such as bacterial/tissue cell culturing, PCR, molecular cloning, and analyzed resulting data using gel electrophoresis, spectrophotometry and fluorescent microscopy.
- Performed computational work such as designing plasmids, primers and restriction enzymes using Benchling.
- Delivered progress updates and a final presentation including results, conclusions and future work within the research group.
  Any future work involving the utilization of the landing pad cell lines will credit this work done by **Yutong Zhu, Aaron Rosenstein and Michael Garton*

Toronto, ON, Canada
May 2018 – Aug 2018

Institute of Biomedical Engineering, University of Toronto | Research Assistant
Supervised by Prof. Alison McGuigan, Tissue Architecture and Microenvironment Design Laboratory

- Designed a high-throughput TRACER platform that is compatible with the 96 well-plate formats through stacking 6 layers of scaffold.
- Evaluated existing deigns of the platform in the literature and proposed suitable improvements and modifications.
- Characterized various parts of the device including a custom well plate, scaffolds and seeding device/pipeline using AutoCAD, SolidWorks and G-code.
- Extended the original design to function under smaller dimensions for various applications.
- Analyzed and processed data and images obtained through fluorescent microscopy using ImageJ.

Industry Experience

Toronto, ON, Canada Nov 2021 – Ongoing	**Uask Education, YOU & WEN Consulting Inc.**	Online Teacher *Department of Online Tutoring* • Designed personalized and professional tutoring plans for secondary school students focusing on topics of mathematics, chemistry and biology. • Provided one-on-one online tutoring sessions with students to resolve questions.
Xi'an, SN, China May 2018 – Aug 2018	**Investment Banking Department, China Merchants Bank**	Summer Analyst *Mergers and Acquisitions Sector, Research and Development Team* • Performed research on a variety of industries via stock analysis and risk management. • Interviewed CFOs from different companies to develop a coherent and consistent knowledge of the company in the context of mergers and acquisitions cases. • Recorded meeting notes and delivered presentations on case analysis within the group.

Publications

2022 1. Li, N. T., Wu, N. C., Cao, R., Cadavid, J. L., Latour, S., Lu, X., **Zhu, Y.**, Mijalkovic, M., Roozitalab, R. & McGuigan, A. P. An off-the-shelf multi-well scaffold-supported platform for tumour organoid-based tissues. *Submitted to Biomaterials* (2022).

Projects

Toronto, ON, Canada Sep 2020 – Dec 2020	**BME489 Biomedical Systems Engineering Design, University of Toronto** *Subtalar Joint Preparation Device for Fusion During Tibiotalocalcaneal Arthrodesis* Designed and simulated a device that prepares the subtalar joint for fusion during tibiotalocaneal arthrodesis, which consists of 2 modular components: a cutting tool and a guide tube.
Toronto, ON, Canada Jan 2020 – May 2020	**BME346 Biomedical Engineering Omics Technologies, University of Toronto** *Effects of Drugs on Breast Cancer Cell Metastasis* This project focused on the combined effects of drugs on cancer metastasis. Our team discovered great potential in the combination of platelet inhibition and natural killer (NK) cell enhancement, where platelet inhibition sensitizes tumor cells to NK cell activity and NK enhancement increases cytotoxic effects.
Toronto, ON, Canada Sep 2019 – May 2020	**University of Toronto Aerospace Team** *"HERON" Biological Payload Design* The payload subteam of the UTAT Space Systems division specialized in assessing the risk of infection during long term space missions. The objectives were to engineer C. albicans to express GFP with specific genes and create a statistical method for quantifying this gene expression.
Toronto, ON, Canada Jan 2019 – Apr 2019	**AER201 Engineering Design, University of Toronto** *Traffic Cone Deployment Robot* This project focused on the design and fabrication of a fully autonomous mobile robot that can deploy miniature traffic cones based on the detection of "cracks" and "holes". The robot was constructed with mecanum wheels, infrared sensors, and an interactive LCD/keyboard UI.

Technical Skills

Biomedical Experimentation: Tissue Cell Culture, Bacterial Cell Culture, Fluorescence Microscopy, Molecular Cloning, PCR, qPCR, CRISPR, SDS-PAGE, Staining, Spectrophotometry, High-Performance Liquid Chromatography (HPLC)
Biomedical Design: AutoCAD, Solidworks, Benchling
Data Analysis: ImageJ, Simulink, Microsoft PowerPoint, Microsoft Excel
Programming: MATLAB, Python, C, C++, G-code, Java