Qi, Runyu

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EDUCATION

M.S. in Material Science and Engineering *Aug.2023 - Dec.2024*
with Computational Science and Engineering Concentration
University of Illinois Urbana-Champaign, IL, United States

B.E. in Material Science and Engineering *Sept.2019 - Jun.2023*
Tsinghua University, Beijing, China

RESEARCH EXPERIENCE

Computational and Experimental Analysis of Retrotransposons

Advisor: Dr. Yejing Ge (UT MDACC) *Jan. 2024 - Present*

- Optimized scripts and developed automated pipelines for RNA-seq and ChIP-seq analysis of retrotransposons, including alignment, differential analysis, and visualization using HPC.
- Analyzed developmental biology and epigenetics using mouse skin models; conducted cell culture, inhibitor treatments, RNA extraction, and qPCR.

Deep Learning for Pathway Prediction and GPCRs MD Simulation

Advisor: Dr. Diwakar Shukla (UIUC) *Jan. 2024 - Present*

- Conducted molecular dynamics (MD) simulations of G protein-coupled receptors (GPCRs) to study their structural dynamics and interactions.
- Implemented deep learning techniques, including neural networks, to predict biological pathways associated with GPCRs and analyze their molecular dynamics at the atomic level.

mRNA Cancer Vaccine and Cell Metabolic Labeling & Targeting

Advisor: Dr. Hua Wang (UIUC) *Sept. 2023 - Present*

- Assisted in the in vitro experiment of stem cells and dendritic cells mRNA transfection, contributing to the development of mRNA-based cancer vaccines.
- Conducted experiments to optimize the labeling of immune cells and cancer cells with unnatural monosaccharides, enabling targeted metabolic labeling and tracking of cellular processes.

Surface-Enhanced Raman Spectroscopy and Electrochemical Detection of Energetic Materials

Advisor: Dr. Yunhan Ling (Tsinghua Univ.) *Feb. 2023 - Jun. 2023*

- Developed sensors with Surface-Enhanced Raman Spectroscopy (SERS) and electrochemical detection capabilities through the preparation of nanogold SERS substrates, surface modifications, and performance characterization.
- Attained quantitative detection of methylene blue and perchlorate with remarkably low minimum quantification limits.
- Formulated a TNT molecularly imprinted polymer electrode and achieved detection with impressively low minimum detection limits.

**See more on my homepage.*

PRESENTATIONS

A Review on PDMS-based Electronic Skin and Self-healing Property
Advisor: Dr. Lilian Hsiao (NC State) *Jul. 2022 - Aug. 2022*

- Conducted an extensive literature review on PDMS and electronic skins, analyzing over 10 research papers. Synthesized findings into an academic poster and delivered a successful video presentation.

AWARDS

The Tsinghua Univ. Technological Innovation Scholarship *2022*
The second prize, 3^{rd} Virtual Simulation Creative Design Competition *2022*
The first prize, 5^{th} Tsinghua Univ. 3D Printing Skills Competition *2021*
The Tsinghua Univ. Excellent Art Scholarship *2021*
The second prize, 4^{th} Tsinghua Univ. 3D Printing Skills Competition *2020*
National third prize, 32^{th} Chinese Chemistry Olympiad *2018*
National third prize, 27^{th} China National Biology Olympiad *2018*

LEADERSHIP & SERVICE

Member, Tau Beta Pi - Illinois Alpha, UIUC *Apr. 2024*
Captain, Student Network Service Work-study Team, Tsinghua Univ. *Mar. 2021 - Jun. 2023*
President, Future Sci-tech Interests Club, Tsinghua Univ. *Sept. 2022 - Jun. 2023*
Volunteer, Olympic and Paralympic Winter Games, Beijing *Feb. 2022 - Mar. 2022*