



Tianhe (Rory) Wu

B.S. in Applied Mathematics | B.A. in Biology

GPA: 3.99/4.00

Emory University

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EDUCATION

•Emory University

Expected: May 2025

B.S. in Applied Mathematics | B.A. in Biology

Dean's List, Phi Eta Sigma, GPA: 3.9/4.0

- **Relevant Courses:** Data Structure and Algorithm, Mathematical Stats, Organic Chemistry, Neurology, Cancer Biology, Nonlinear Optimization, PDE, Numerical Analysis, Linear Algebra, Multi-variable Calculus, Real Analysis

CONFERENCE & SYMPOSIUM

– [Under Review]

- * Tang, L., Gu, Q., **Wu, T.**, ... & Mao, H. "Investigating Prognostic Value of Dynamic Susceptibility Contrast Perfusion MRI-Derived Features for Glioblastoma Survival by Deep Learning." Abstract at *International Society for Magnetic Resonance in Medicine (ISMRM)*
- * Tang, L., Gu, Q., **Wu, T.**, ... & Mao, H. "Altered Cerebrospinal Fluid Dynamics in Alzheimer's Disease." Abstract at *International Society for Magnetic Resonance in Medicine (ISMRM)*

– [Presented Work]

- * Tang, L., **Wu, T.**, & Mao, H. "Hemodynamic Property Incorporated Brain Tumor Segmentation by Deep Learning and Density-Based Analysis of Dynamic Susceptibility Contrast-Enhanced MRI."; Poster at *World Molecular Imaging Congress 2023*; 2023 Sep 6; Prague, Czech Republic.
- * Martin E, Valavala N, **Wu, T.**, Asante R, Taliaferro-Smith L. "The Impact of c-Jun Initiated Tap63 Upregulation on TNBC Metastasis."; Poster at *2023 Oxford College Research Scholar Symposium*; 2023 Apr 14; Oxford, GA.

PUBLICATIONS

– [Under Review]

- * Li, Y., Mozhi, A., Ma, H., Padelford, J., Zhang, Z., **Wu, T.**, Gu, Q., Wang, Z., & Mao, H. "A M2-Subtype Macrophage Targeted Magnetic Nanoparticle Probe for Magnetic Resonance Imaging of Tumor-Associated Macrophages in the Orthotopic Patient-Tissue-Derived Xenograft Model of Glioblastoma." *Acta Biomaterialia*.

– [Published Work]

- * Tang, L., **Wu, T.**, Hu, R., Gu, Q., Yang, X., & Mao, H. (2024). "Hemodynamic Property Incorporated Brain Tumor Segmentation by Deep Learning and Density-Based Analysis of Dynamic Susceptibility Contrast-Enhanced MRI." *Quantitative Imaging in Medicine and Surgery*. 🔗
- * **Wu, T.**, Liu, C., Thamizhchelvan, A. M., Fleischer, C., Peng, X., Liu, G., & Mao, H. (2023). "Label-Free Chemically and Molecularly Selective Magnetic Resonance Imaging." *Chemical & Biomedical Imaging*. 🔗
- * Thamizhchelvan, A. M., Ma, H., **Wu, T.**, Nguyen, D., Padelford, J., Whitworth, T. J., Li, Y., Yang, L., & Mao, H. (2024). "Shape-Dependent Cell Uptake of Iron Oxide Nanorods: Mechanisms of Endocytosis and Implications on Cell Labeling and Cellular Delivery." *Nanoscale*. 🔗
- * Yao, L., & **Wu, T.** (2024). "Application and Regulatory Challenges of Artificial Intelligence/Machine Learning in Clinical Trials from the Perspectives of FDA Discussion, EMA Reflection Paper, and the Stakeholders' Comments." *China Food & Drug Administration Magazine*. 🔗
- * Wu, J., **Wu, T.**, & Yao, L. (2024). "A Brief Analysis of Regulatory Sandboxes for Disruptive Innovation in Pharmaceutical Products." *China Food & Drug Administration Magazine*. 🔗

RESEARCH EXPERIENCE

•Winship Cancer Institute, Emory Medical School

Jun 2022 – Present

Research Assistant; Supervised by Dr. Hui Mao

Atlanta, GA

- Developed novel U-Net/HDBScan model to incorporate hemodynamic properties into brain tumor segmentation using dynamic susceptibility contrast-enhanced MRI

- Enhanced glioblastoma prognosis by integrating DSC perfusion MRI hemodynamic features with HDBNet for feature extraction and XGBoost for prediction, achieving 0.72 ROC-AUC accuracy for 10- and 16-month survival outcomes
- Utilized resting-state fMRI to identify altered cerebrospinal fluid dynamics as potential biomarkers for early Alzheimer's and mild cognitive impairment
- Explored SwinIR based methods for 7T MRI Image Super-Resolution
- Developed Learning Based Confocal Signal Identification Algorithm, Python-based
- Investigated shape-dependent cellular uptake of iron oxide nanorods (IONR) with different aspect ratios, revealing that larger IONRs exhibited higher uptake in macrophages and cancer cells via distinct endocytosis pathways.
- Participated in the development of an MRI probe using sub-5 nm ultrafine iron oxide nanoparticles (uIONP) with M2-specific peptides (M2pep) to target pro-tumoral M2 tumor-associated macrophages (TAM) in glioblastoma, achieving 88.7-fold higher tumor accumulation and superior MRI contrast compared to Ferumoxytol, enabling non-invasive imaging of TIME changes.

•Department of Biomedical Informatics, Emory Medical School

Jan 2024 - Present

Student Researcher; Supervised by Dr. Hyeokhyen Kwon

Atlanta, GA

- Exploring GenAI-based methods for movement disorder analysis including GAN-based and diffusion-based methods
- Developing unsupervised diffusion-transformer model, using motion reconstruction as a pre-training task to extract latent representations for downstream movement disorder analysis with limited disease labels
- Redesigned the VAE and positional encoding structure in diffusion transformer, enabling adaptive window sizes on the temporal dimension to handle diverse motion patterns.
- Validated the model through linear probing, demonstrating comparable performance in predicting medication status and FOG scores against supervised DeepCONV-LSTM baselines.

•South Medical Economics Institute, National Medical Products Administration (NMPA) April 2023 - Aug 2024

Volunteering student: Supervised by Mr. Lixin Yao

Remote, Hybrid

- Investigated integration of ML/AI and PET-related innovations into clinical practice under regulatory frameworks, with a focus on accessibility for underserved communities.
- Explored pathways for national insurance coverage of PET-CT cancer diagnostics, contributing to pilot reimbursement programs in four provinces.
- Developed policy recommendations to reduce systemic healthcare inequities, emphasizing patient-centered care and affordability.

•Biology Department of Oxford College, Emory University

Aug 2022 - May 2023

Student Researcher; Supervised by Dr. Latonia Taliaferro-Smith

Oxford, GA


- Investigated the effect of Tap63a upregulation through c-Jun in Triple Negative Breast Cancer

•Tsinghua University & Bluepha

Nov 2018 - Dec 2019

Captain of IGEM Team BESA-China

Beijing, China

- Co-led a team of fifteen to design NEZHA, a noncanonical amino acid controlled, extraordinarily sensitive, modularized, heavy metal sensor, and absorber 

LEADERSHIP EXPERIENCE

•Emory International Pre-health Organization

May 2022 - Present

Co-President of 2024 | Chair of Academic Development 2023 | Member of Oxford Committee 2022

- Spearheading the coordination and integration of 7 distinct departments and committees
- Leading a dynamic team of 30+ members distributed across two campuses
- Curated and refined over 50 weekly newsletters, engaging an audience of 350 subscribers
- Conceptualized and executed 5 professional career panels, featuring 20 Academic/Industry experts

•International Student Advocacy Board

August 2021 - Sep 2022

Representative

- Gathered opinions from the international student body and provided feedback to the International Students' Office
- Coordinated summer housing availability for incoming international students
- Coordinated 2 faculty-student panel

TECHNICAL SKILLS

Languages: Native in Mandarin, Proficient in English, Beginner in Latin

Developer Tools: Python, Rust, C++, Bash, Linux, Java, MATLAB, R, FSL

Experimental Tools: MRI, Confocal Microscopy, Flow Cytometry, Cell Culture, PCR, Western Blot