ETHAN CHANG

Ph.D. Student | WashU in St. Louis

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SUMMARY

Passionate researcher interested in NeuroAI - building bio-realistic brain models to optimize artificial neural networks. Key interests include generalizing neural networks, computational neuroscience, mathematical modeling, AI/ML/DL, and astrocytes.

SKILLS

Languages Python, Java, MATLAB, R, HTML, CSS, JavaScript.

Other Sage, LaTeX, Excel, Powerpoint.

EDUCATION

2025 – Present **Ph.D. in Neuroscience** — **Washington University in St. Louis**
School of Medicine, Division of Biology & Biological Sciences (DBBS)
- Dissertation: In Progress
- Thesis Advisor: TBD

2025 – Present **Master of Science in Applied and Computational Mathematics** — **Johns Hopkins University**
Whiting School of Engineering
- Emphasis: Probability & Stochastic Processes, Optimization & Game-Theory, Machine Learning

2021 - 2025 **Bachelor of Arts in Mathematics** *and* **Bachelor of Science in Neuroscience with High Distinction** — **University of Rochester**
School of Arts and Sciences
- Certificate in Biotechnology, Minor in Psychology. Cluster in Philosophy: Ethics and Values.

AWARDS/GRANTS

2025 – Present **Doctoral** — **Washington University in St. Louis**
- NIH T32 Predoctoral Trainee, Neuroscience Training Program (T32NS121881)

2021 – 2025 **Undergraduate** — **University of Rochester**
- Schwartz Discover Grant, 2024
- Dean's List
- BankCard Services Scholarship Award, 2021

RESEARCH

2025 – Present **Doctoral Researcher: Rotating in Brain Dynamics and Control Group** — **Washington University in St. Louis**
Department of Electrical and Systems Engineering, McKelvey School of Engineering
- Laboratory of Dr. ShiNung Ching, Ph.D.
- Research Focus: Modeling astrocytes to optimize neural network performance.

2021 – 2025 **Researcher in Center for Translational Neuromedicine** — **University of Rochester**
Department of Neurology, University of Rochester Medical Center
- Laboratory of Dr. Maiken Nedergaard, M.D., D.M.Sc.
- Official positions: School of Medicine and Dentistry Intern, Glymphatic System Technical Associate I, Schwartz Discover Scholar
- Research Focus: The contribution of aquaporin-4 (located on astrocytic endfeet) to glymphatic function.

PUBLICATIONS

- Gahn-Martinez D, Giannetto M, **Chang E**, Beam N, Pla V, Nedergaard M. Chronic Intraventricular Cannulation for the Study of Glymphatic Transport. *eNeuro.* doi: 10.1523/ENEURO.0537-24.2025
- Giannetto M, Gomolka R, Gahn-Martinez D, Newbold E, Bork P, **Chang E**, Gresser M, Thompson T, Mori Y, Nedergaard M. Glymphatic fluid transport is suppressed by the AQP4 inhibitor AER-271. *Glia.* doi: 10.1002/glia.24515

PRESENTATIONS

- **Chang E (presenter)**, Giannetto M, Agarwald I, Nick Vento, Gahn-Martinez D, Nedergaard M. Aquaporin-4 Expression on Glymphatic Clearance Routes and Function. Schwartz Discover Scholar Showcase. 2024
- **Chang E (presenter)**, Giannetto M, Gahn-Martinez D, Nedergaard M. Aquaporin-4 Expression and Size-Dependent Solute Movement in the Brain. University of Rochester Undergraduate Research Exposition. 2024.
- **Chang E (presenter)**, Barth RK. Isolation of Hydrogen Sulfide Producing Bacteria from the environment. Department of Microbiology and Immunology Poster Session. 2023.
- Giannetto M, Gomolka R, Gahn-Martinez D, Newbold E, Bork P, **Chang E (presenter)**, Gresser M, Thompson T, Mori Y, Nedergaard M. Glymphatic fluid transport is suppressed by the AQP4 inhibitor AER-271. University of Rochester Undergraduate Program in Biology and Medicine Poster Symposium. 2023.

TEACHING

2022 – Present **Teaching**

- ***Teacher for UR SPLASH***
  Co-taught a free class with Audrey Jung to RCSD High School students, introducing basic neuroscience concepts behind mental and degenerative disorders and how to get involved in research. 2024.
- ***Teaching Assistant: NSCI 201P***
  Basic Neurobiology Lab at the University of Rochester, Department of Brain and Cognitive Sciences with Dr. Renee Miller, Ph.D. 2023.
- ***Biology and Chemistry Tutor***
  Provided one-on-one tutoring assistance to high school biology and chemistry students. 2022-2023.

2023 – Present **Mentoring**

- Audrey Jung, University of Rochester Undergraduate, C.O. 2027. Neuroscience Undergraduate Council.
- Isha Agarwald, University of Rochester Undergraduate C.O. 2026. Center for Translational Neuromedicine.
- Nick Ventokl, University of Rochester Undergraduate C.O 2026. Center for Translational Neuromedicine.

SERVICE AND LEADERSHIP

2025 – Present **Doctoral** **Washington University in St. Louis**

- ***Finance Committee Member***
  WashU DBBS Student Advisory Committee, where I helped oversee and manage the financial budget of DBBS SAC and student events.
- ***Graduate Student Advisory Board Representative***
  WashU Center for Career Engagement, where I gave insights and pushed for optimizing resources for graduate students interested in pursuing industry as a career path.
- ***St. Louis Neuroscience Outreach Volunteer***
  Hosted an interactive table at the Amazing Brain Carnival for the St. Louis Science Center's SciFest to foster excitement and understanding of STEM.

2021 – 2025 **Undergraduate** **University of Rochester**

- ***Deputy Chair for Academic Affairs Committee***
  Student's Association, where I played a key role in leading a team of nine on 15+ initiatives to enhance the student academic experience. Spearheaded projects expanding research opportunities and fostering inter- and intradepartmental collaboration.
- ***Emergency Department Clinical Support***
  Strong Memorial Hospital. Supported clinical operations during the COVID-19 Omicron peak. Main responsibilities include vital acquisition, EKG, and phlebotomy. Helped nurses and doctors as needed.
- ***Student Research Ambassador***
  Office of Undergraduate Research. Acted as a contact to answer questions about research involvement from the 6,000+ undergraduate student body and served on the student panels at admission events.
- ***Emergency Medical Technician***
  RC-MERT, providing free and confidential service to students. Also served on the Selections Committee, where we assessed 80-100 applications and facilitated interviews.
- ***Archery Club Executive Board***
  I helped run practices with 25+ people. Increased range time by 50% and assisted in managing equipment, club logistics, conflict resolution, and funding/budgeting.
- ***Hospital volunteering***
  Friends of Strong, assisting multiple departments in logistics
- ***College coach volunteer***
  AmeriCorps/Hoekelman Center at SMH. Assisted and encouraged underserved students at RCSD to attend college, where graduation rates rose to 71%

RELEVANT COURSES

- Cellular Neurobiology
- Machine Learning Theory*
- Measure Theoretic Probability*
- Real Analysis*
- Organic Chemistry I and II
- Neural Systems*
- Game Theory*
- Bayesian Statistics*
- Point-set Topology
- Genetics, Biochemistry
- Computational Neuroscience
- Optimization*
- Stochastic Processes
- Numerical Analysis
- Microbiology
- Matrix Theory, Linear Algebra
- Data Structures and Algorithms
- Probability, Mathematical Statistics
- Multidimensional Calculus
- Differential Equations

*to take

LANGUAGES

English - native, **Mandarin Chinese** - intermediate