

ETHAN CHANG

Ph.D. Student | WashU in St. Louis

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SUMMARY

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

SKILLS

Languages Python, Java, C++, 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)
• CCSN Pathway, McDonnell Center for Systems Neuroscience
• Thesis Advisor: TBD
- 2025 – Present **Master of Science in Applied and Computational Mathematics** Johns Hopkins University
Whiting School of Engineering
• Focus: Machine learning, Probability, Optimization
- 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 **Graduate** Washington University in St. Louis
• Neuroscience Training Grant, NIH 5T32NS121881-05
- 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 Papouin Lab** Washington University in St. Louis
Department of Neuroscience, School of Medicine
• Laboratory of Dr. Thomas J. Papouin, Ph.D.
• Research Focus: Identifying and characterizing how astrocytes contribute to neural computation. Elucidate biologically relevant mechanisms to inspire and inform computational models.
- 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 **Graduate** **Washington University in St. Louis**
- **Graduate Student Advisory Board Representative**
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

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|---------------------------------|----------------------------------|--|-----------------------------|------------------------------|
| • Cellular Neurobiology | • Deep Neural Networks* | • Measure Theoretic Probability* | • Real Analysis* | • Organic Chemistry I and II |
| • Neural Systems* | • Machine Learning 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