

## RACHEL SHARP

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### EDUCATION

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|------------|---|---------------------------|
| <b>PhD</b> | University of North Carolina at Chapel Hill (UNC)   Neuroscience Certificate in Bioinformatics and Computational Biology  | August 2021 – Spring 2025 |
| <b>BS</b>  | University of Oklahoma (OU)   Psychology, Criminology Minor<br>Summa Cum Laude (4.0 GPA)<br>Pursued rigorous upper-level and graduate-level coursework in biology and computer science in addition to major coursework. | Aug 2016 – Dec 2019       |

### RESEARCH AND PROFESSIONAL EXPERIENCE

**Graduate Research Assistant** | University of North Carolina at Chapel Hill      April 2022 – Spring 2025  
Principal Investigator: Dr. Michael Love

*Project: Statistical Validation of Genetic Variants Associated with Neuropsychiatric Disorders in Genome-wide Association Studies (GWAS)*

- Use R, Bash, and other coding languages to identify genetic variants associated with neuropsychiatric disorders from GWAS and Massively Parallel Reporter Assay (MPRA) datasets.
- Integrate results with Quantitative Trait Loci datasets to interrogate genetic mechanisms contributing to disease penetrance.
- Demonstrated the statistical failure of commonly used algorithms to prioritize causal variants, a major contribution to the field.

*Project: Statistical Pipeline Development for Standardized Analysis of MPRA Data Across Institutions within the International Impact of Genomic Variation on Function Consortium (IGVF)*

- Develop streamlined pipelines to systematically and reproducibly analyze MPRA data across five internationally funded centers.
- Organize teams across centers to develop discrete pipeline portions. Led cross-center meetings to streamline communication and strategize next steps.

**Bioinformatic Analyst** | OU Health Science Center Core Facilities      Jan 2020 - Aug 2021  
Principal Investigator: Dr. Kenneth Jones

- Independently produced custom scripts in R, Python, Bash, and other languages to process and analyze data from Single Cell and Bulk Sequencing Projects.
- Collaborated with 20+ PIs on diverse projects including metastasis of glioblastomas, cancer subtypes in zebrafish models, cell morphology shifts in myopia, and genetic signatures of type 2 diabetes.
- Produced high-quality figures and descriptions for papers and grants.
- Monitored and employed new technologies and methods in the biological, statistical, computational, and analytic fields.

**Lab Manager** | OU Visual Neuroscience Lab      Jan 2018 – Dec 2019  
Principal Investigator: Dr. Michael Wenger

- Managed and directed 20+ undergraduate research assistants.
- Conducted studies examining the effects of iron deficiency on cognition in college-aged women, women undergoing smoking cessation, and perimenopausal women.

- Collected and analyzed EEG data from EGI nets and gel-based caps.
- Trained two graduate students and 20+ undergraduate research assistants on EEG net application and safety, data acquisition, and data processing.

#### SELECTED CONFERENCE PRESENTATIONS AND ABSTRACTS

1. **Sharp, R.R.**, McAfee, J., Lee, S., Rosen, J., Love, M.I., Won, H. (2023, May). *Statistical Validation of GWAS-Identified Neuropsychiatric Variants*. **Poster presentation** at the Bi-annual Genomics of Brain Disorders Conference; Wellcome Genome Campus, UK.
2. **Sharp, R.R.**, Broadaway, K.A., McAfee, J.C., Mohlke, K.L., Love, M.I., Won, H. (2022, September). *Computing MPRA and QTL Variant Overlap for Schizophrenia-associated, Fine-mapped Variants*. **Selected for lightening talk and poster presentation** at the annual meeting for the Impact of Genomic Variation on Function Consortium; Bethesda, Maryland. **Recipient of award for best poster presentation.**
3. Wenger, M., **Sharp, R.**, McCollum, A., De Stefano, L., Rhoten, S., Worth, T. (2019, June). *Negative Impacts of Iron Deficiency on Visual Category Learning Quantified in Terms of Dopaminergic Status and Brain Energy Expenditure*. **Poster presentation** at the annual meeting of the Vision Sciences Society; St. Pete Beach, Florida. Published in *Journal of Vision* (2019)
4. **Sharp, R.**, Foster, S., Carvallo, M. (2017, May). *The Fundamental Attribution Error and Prejudice Reversal*. Poster presentation at the annual University of Oklahoma Psychology Conference; Norman, Oklahoma. **Recipient of award for Best Undergraduate Research Poster.**

#### GRANTS, HONORS, AWARDS, AND SCHOLARSHIPS

<b>National Science Foundation Graduate Research Fellowship Program</b>	2023
Research grant received covering \$111,000 in stipend over 3 years, in addition to funds covering all costs for tuition, fees, insurance, and travel.	
<b>Genomics of Brain Disorders Conference Bursary Travel Awardee</b>	2023
<b>Best Poster Presentation Award (2<sup>nd</sup> place)</b>	2022
Awarded at the annual Impact of Genomic Variation on Function Consortium meeting as a second-year graduate student in competition with post-docs from internationally funded centers.	
<b>UNC Department of Neuroscience T32</b>	2022
<b>Big Woman on Campus Award</b>	2019
Awarded to individuals who have excelled in the areas of scholarship, character, leadership, and service to the OU community.	
<b>Regent's Award for Outstanding Juniors</b>	2019
<b>Dean's Award for Outstanding Honors College Leadership</b>	2019
<b>John Benjamin Rotary Scholarship</b>	2019
For high-achieving students and children of Tulsa first responders.	
<b>President's Award for Outstanding Sophomores</b>	2018
<b>Ruby Brakebill Scholarship</b>	2018
For students with a strong social conscience and leadership abilities.	
<b>Patti Johnson Wilson Scholarship</b>	2017
For high-achieving students in the liberal arts who also maintain employment.	
<b>President's International Travel Fellowship</b>	2017
<b>National Merit Scholar</b>	2016

## TEACHING EXPERIENCE

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**Volunteer R Instructor** | UNC School of Medicine June 2022 - Present

- Teach the R programming language and general coding practices to 40 students enrolled in the How to Learn to Code R course.
- Teach students how to load and work with packages, debug code, use APIs, and organize their scripts.

**Writing Assistant** | OU Honors College May 2018 - Dec 2019

- Taught advanced written language skills to 25 students in various Honors College writing courses which aim to develop critical thinking and a broad world-view.
- Assisted students in developing tools for persuasion, clarity, and emotion in writing.

**Peer Learning Assistant** | OU University College Jan 2019 - Dec 2019

- Tutored 50+ students in Intro Biology, Java I and II, Research Methods, Intro Psychology, and Study Skills.
- Worked individually and with teams of tutors to facilitate a student-lead learning experience based on Socratic questioning.
- National Tutor Certification.

**Ceramics Instructor** | San Miguel Middle School January 2016 – June 2016

- Independently developed a ceramics program for an underprivileged middle school in Tulsa, Oklahoma
- Fundraised and purchased all necessary supplies for teaching and implementing a ceramic class.
- Wrote lesson plans and independently instructed twelve students on the basics of ceramics and 3D art at their middle school over the course of a semester.
- Seeded the school with program details, supplies, and additional funds to continuing running the program.

## LEADERSHIP, MENTORSHIP, AND SCIENCE OUTREACH

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**Student Neuroscience Executive Committee | President** Aug 2022 - Present

Act as a bridge between neuroscience students and program officials to advocate for student needs, adjust classes and events accordingly, and promote community. Rewrote the Neuroscience program qualifying exam, ran and organized the annual retreat, and facilitated interactions between trainees and administration year-round.

**Culbreth Middle School STEAM Day Volunteer Instructor** 2024

Lead a presentation to rotating classes of middle schoolers on DNA, graduate education, and career paths in science.

**Human Functional Regulatory Genomics Group Organizer** 2023 – Present

Plan, organize, recruit speakers for, and facilitate monthly trainee-focused meetings with presentations and discussions on topics in the field of functional genomics.

**BrainPost Science Blog Writer** 2023 - Present

Compose summarized blog posts of published neuroscience articles for a non-scientist audience.

**Women in Science Promoting Inclusion in Research Experiences Student Recruitment Team** August 2022 - Present

Recruit high school students from the research triangle area to participate in our summer mentorship program aimed at creating a space where students from minoritized genders can gain confidence in their

ability to pursue a career in STEM by doing real scientific research with the help of early-career scientists. Mentor the students during the duration of the program and lead workshops on science communication to a broad audience.

**Peer Mentor**

Aug 2022 - Present

Mentor first year graduate students to guide them through rotations, classes, and adjusting to life in graduate school.

**Letters to a Pre-Scientist**

Aug 2022 - Present

Exchange letters with a middle-school pen pal from an underprivileged school to humanize STEM professionals, demystify STEM careers, and inspire future exploration in STEM.

**Pipette Pen Writer and Editor**

Aug 2022 - Present

Write and edit articles written by fellow graduate students to be published in *Pipette Pen*, an online journal focusing on science writing and communication to expose non-scientists to scientific topics.

**BBSP In-Person Visits Planning Committee**

Jan 2022 - Present

Work with the graduate admissions office to plan and organize events for incoming graduate students.

**UNC Summer Undergraduate Research Experience Mentor**

Summer 2023

Mentor undergraduate students participating in a summer research internship to guide them through the process of choosing a post-undergraduate career path, applying to graduate schools, and finding their place in academia.

**DNA Day Blog Scheduler, Translation Coordinator, and Editor**

July 2022 – July 2023

Organize, schedule, and facilitate communication between writers and editors for the NC DNA Day Blog, an online forum for discussing scientific topics, written for a layman audience. Independently developed a process of recruiting Spanish translators to increase science access, bringing our translated article count from 3 translated over a period of two years, to 17 translated in a single semester.

**Triangle Brain Bee**

Aug 2022 – April 2023

Write questions for, judge, and organize tutoring sessions for the Brain Bee, an annual spelling-bee style competition engaging middle school students with topics in Neuroscience.

**Honors Mentorship Program Director**

Jan 2018 - Dec 2019

Independently expanded and directed the program, assembled an executive team, organized events, secured funding sources, and provided mentoring opportunities for Honors College Freshmen.

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**COMMUNITY OUTREACH**

**Crisis Text Line**

Jan 2019 – Dec 2019

Certified Crisis Counselor volunteer providing de-escalation services to individuals in crisis.

**Oklahoma Department of Corrections**

July 2017 – Dec 2017

Volunteer with the OK Messages Project connecting incarcerated parents to their children.

**Honors at Oxford Study Abroad Program**

July 2017 – Aug 2017

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**SELECTED PEER REVIEWED PUBLICATIONS**

1. Yashchenko, A., Bland, S. J., Song, C. J., Ahmed, U. K. B., **Sharp, R.**, Darby, I. G., Cordova, A. M., Smith, M. E., Lever, J. M., Li, Z., Aloria, E. J., Khan, S., Maryam, B., Liu, S., Crowley, M.

- R., Jones, K. L., Zenewicz, L. A., George, J. F., Mrug, M., ... Zimmerman, K. A.. "Cx3cr1 Controls Kidney Resident Macrophage Heterogeneity," *Frontiers in Immunology* 14 (2023)
2. Larabee, J. L., Doyle, D. A., Ahmed, U. K. B., Shadid, T. M., **Sharp, R. R.**, Jones, K. L., Kim, Y. M., Li, S., & Ballard, J. D.. "Discovery of Hippo Signaling as a Regulator of CSPG4 Expression and as a Therapeutic Target for Clostridioides Difficile Disease," *PLOS Pathogens* 19, no. 3 (2023)
  3. Nelson, B. N., Daugherty, C. S., **Sharp, R. R.**, Booth, J. L., Patel, V. I., Metcalf, J. P., Jones, K. L., & Wozniak, K. L.. "Protective Interaction of Human Phagocytic APC Subsets with Cryptococcus Neoformans Induces Genes Associated with Metabolism and Antigen Presentation," *Frontiers in Immunology* 13 (2022)
  4. De Jong, N. P., Rudolph, M. C., Jackman, M. R., **Sharp, R. R.**, Jones, K., Houck, J., Pan, Z., Reusch, J. E. B., MacLean, P. S., Bessesen, D. H., & Bergouignan, A.. "Short-Term Adaptations in Skeletal Muscle Mitochondrial Oxidative Capacity and Metabolic Pathways to Breaking up Sedentary Behaviors in Overweight or Obese Adults," *Nutrients* 14, no. 3 (2022)
  5. Matye, D. J., Wang, H., Luo, W., **Sharp, R. R.**, Chen, C., Gu, L., Jones, K. L., Ding, W.-X., Friedman, J. E., & Li, T.. "Combined ASBT Inhibitor and FGF15 Treatment Improves Therapeutic Efficacy in Experimental Nonalcoholic Steatohepatitis," *Cellular and Molecular Gastroenterology and Hepatology* 12, no. 3 (2021)
  6. Scalzo, R. L., Foright, R. M., Hull, S. E., Knaub, L. A., Johnson-Murguia, S., Kinanee, F., Kaplan, J., Houck, J. A., Johnson, G., **Sharp, R. R.**, Gillen, A. E., Jones, K. L., Zhang, A. M. Y., Johnson, J. D., MacLean, P. S., Reusch, J. E. B., Wright-Hobart, S., & Wellberg, E. A.. "Breast Cancer Endocrine Therapy Promotes Weight Gain With Distinct Adipose Tissue Effects in Lean and Obese Female Mice," *Endocrinology* 162, no. 11 (2021)

## TECHNICAL SKILLS

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R	Java
Bash	MATLAB
GitHub	SPSS
Python	CYPHER
Unix	Adobe Illustrator