Mallory A. Maurer

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EDUCATION

B.S., Chemistry and Neuroscience, University of North Carolina at Chapel Hill **2021**

Dedicated and enthusiastic researcher with a strong background in molecular biology, chemistry, and neuroscience, backed by extensive laboratory research. Committed to acquiring comprehensive expertise and furthering my academic and research career, ultimately reaching my goal of principal investigator in academia.

RESEARCH EXPERIENCE

Research Assistant II, Division of Diabetes and Endocrinology **July 2024-Present**
Laboratory of Dr. Jeeyeon Cha, M.D., Ph.D., Vanderbilt University Medical Center
Lead a collaborative project with a classic forward genetic screen and quantitative trait loci (QTL) mapping to identify modifier genes of the transcription factor MAFA, resulting in a co- (3) and first-author (1) publication.

- Backcross and intercross mouse strains, perform frequent glucose tolerance testing to phenotype mice, and collaboratively analyze genetic data to map QTLs.
- Harvest mouse pancreatic islets for characterization through immunostaining, RNA-sequencing, RNAScope, or qPCR, using R, MATLAB, and QuPath to analyze data.
- Participate in and administratively lead group academic and journal club discussions and presentations.
- Mentor rotational graduate students, undergraduate researchers, and visiting medical school students.
- Assist in grant writing to further research, write a manuscript on the forward genetic screen and QTL project, and present findings in poster sessions and seminars.

Research Assistant, Molecular Pharmacology **August 2022-June 2024**
Research Technician **June 2021-August 2022**
Laboratory of Dr. Craig Lindsley, Ph.D., Vanderbilt's Warren Center for Neuroscience Drug Discovery
Designed and led molecular pharmacology for drug discovery projects to examine GPCR and kinase drug targets for treating CNS disorders, resulting in 5 co-author publications (2, 4-7) and 7 patents.

- Independently researched and established SOPs and standard data analysis protocols for pharmacological assays, including live-cell calcium mobilization fluorescence, FRET, and AlphaLISA assays.
- Generated and characterized monoclonal stable transfected cell lines in both CHO and HEK backgrounds for use in weekly high-throughput GPCR-target drug screening assays on novel compounds.
- Held a senior role within the molecular pharmacology group, training, mentoring, and supervising younger research staff.
- Regularly communicated experimental results, literature reviews, and project updates during interdisciplinary meetings with medicinal chemistry, pharmacokinetic, and in Vivo teams, as well as industry and academic collaborators.

Undergraduate Research Assistant, Biomedical Engineering **December 2017-December 2019**
Laboratory of Dr. Nancy Allbritton M.D., Ph.D., UNC-Chapel Hill
Assisted graduate students in culturing and experimenting with primary human cells in colon-on-a-chip models to evaluate effects of hyperglycemia on colonic function, resulting in a co-author publication (8).

- Provided lab-wide support through cell culture, histology, microscopy, and UV-vis spectroscopy.
- Utilized immunofluorescent staining and TEER measurements to evaluate colonic cell function and integrity, analyzing images of fluorescently stained tight junctions using ImageJ and MATLAB.
- Authored research reports each semester and presented research findings in group meetings.

PROFICIENT TECHNICAL SKILLS

Chemistry:	Gas chromatography, liquid chromatography, mass spectrometry, NMR, UV-vis spectroscopy
in Vivo:	Cross- and interbreeding of mouse backgrounds, euthanasia, genotyping, IP injections, mice husbandry, oral gavage dosing, organ harvesting
Molecular and Cellular Biology:	AlphaLISA, bacterial transformation, calcium mobilization fluorescence assays, cDNA synthesis, DNA/RNA isolation, ELISAs, EMSA gel shift assays, FRET assays, gel electrophoresis, immunohistochemistry, in vitro kinase/phosphatase assays, nuclei isolation, PCR, plasmid transfection, primary mammalian cell culture, qPCR, RNAScope, stable cell line generation, Western blotting
Quantitative Biology:	logarithm of odds linkage testing, quantitative trait loci mapping, single-cell and bulk RNA-sequencing analysis, z-score transformation
Software:	Graphpad Prism, ImageJ, MATLAB, Python, QuPath, R

PEER-REVIEWED PUBLICATIONS

1. **Maurer, M.**, Lee, D., Johnson, L., Loyd, Z., Magnuson, M.A., Keller, M., Cha, J., Effects of mouse genetic background on the phenotypic presentation of MODY variant MafAS64F. [In preparation]

2. Henderson, S.H., Ringuette, A.E., Whomble, D.L., Captstick, R.A., Richardson, A.E., **Maurer, M.A.**, Billard, N.B., Lei, X., Wilkinson, J.C., Kethanapalli, S.H., Cho, H.P., Rodrigues, A.L., Niswender, C.M., Peng, W., Rook, J.M., Chang, S., Blobaum, A.L., Boutaud, O., Felts, A.S., Conn, P.J., Lindsley, C.W., Temple, K.J. Discovery of 7-(Pyridin-3-yl)thieno[3,2-*b*]pyridine-5-carboxamides as Negative Allosteric Modulators of Metabotropic Glutamate Receptor Subtype 5. *ACS Chemical Neuroscience* [Submitted for review]

3. Loyd, Z., Lee, D., **Maurer, M**., Lui, J., Guo, M., Reynolds, G. Magnuson, M.A., Cartailler, J.P., Stein, R., Cha, J. Genetic background influences the heterogeneous phenotypes driven by the $MAFA^{S64F}$ MODY variant in mice. *bioRxiv* [Preprint]. 2025 May 25.

4. Crocker, K.E., Henderson, S.H., Capstick, R.A., Whomble, D.L., Bender, A.M., Felts, A.S., Han, C., Engers, J.L., Billard, N.B., **Maurer, M.A.**, Cho, H.P., Rodriguez, A.L., Niswender, C.M., O'Neill, J., Watson, K.J., Chang, S., Blobaum, A.L., Boutaud, O., Peng, W., Rook, J.M., Conn, P.J., Lindsley, C.W., Temple, K.J. Discovery of Thieno[3,2-b]pyridine-5-carboxamide and 2,3-Diflurobenzamide Negative Allosteric Modulators of Metabotropic Glutamate Receptor Subtype 5. *ACS Medicinal Chemistry Letters.* 2025 Apr 22;16(5):865-874.

5. Childress, E.S., Capstick, R.A., Crocker, K.E., McCaslin, M.L., Bender, A.M., **Maurer, M.A.**, Billard, N.B., Cho, H.P., Rodriguez, A.L., Niswender, C.M., Peng, W., Rook, J.M., Chang, S., Blobaum, A.L., Boutaud, O., Gray, A.T., Jones, C.K., Conn, P.J., Felts, A.S., Lindsley, C.W., Temple, K.J. Discovery of 4-(5-Membered)Heteroarylether-6-methylpicolinamide Negative Allosteric Modulators of Metabotropic Glutamate Receptor Subtype 5. *ACS Medicinal Chemistry Letters.* 2024 Nov 18;15(12):2210-2219

6. Li, J., Orsi, D., Engers, J., Long, M., Capstick, R., **Maurer, M.A.**, Presley, C., Vinson, P., Rodriguez, A., Han, A., Cho, H., Chang, S., Jackson, M., Bubser, M., Blobaum, A., Boutaud, O., Nader, M., Niswender C., Conn, P. J., Jones, C., Lindsley, C., Han, C. Development of VU6036864: a triazolopyridine-based high-quality antagonist tool compound of the M5 muscarinic acetylcholine receptor. *Journal of Medicinal Chemistry*. 2024 Aug 22;67(16):14394-14413.

7. Jayakodiarachchi, N., **Maurer, M.A.**, Schultz, D.C., Dodd, C.J., Gray, A.T., Cho, H.P., Boutaud, O., Jones, C.K., Lindsley, C.W., Bender, A.B. Evaluation of the indazole analogs of 5-MeO-DMT and related tryptamines as serotonin receptor 2 agonists. *ACS Medicinal Chemistry Letters.* 2024 Jan 19;15(2):302-309.

8. Dutton, J.S., Hinman, S.S., Kim, R., Attayek, P.J., **Maurer, M.**, Sims, C.S., Allbritton, N.L. Hyperglycemia minimally alters primary self-renewing human colonic epithelial cells while TNFα promotes severe intestinal epithelial dysfunction. *Integrative Biology.* 2021 Jun 15;13(6):139-152.

SCIENTIFIC POSTERS and PRESENTATIONS

Vanderbilt Diabetes Day (Vanderbilt University, Nashville, TN) **December 9, 2025**
Poster: Effects of Genetic Background on Phenotypic Prevalence of the S64F MafA Mutation

Beta Cell Interest Group (Vanderbilt University, Nashville, TN) **October 22, 2025**
Presentation: Effects of Genetic Background on Phenotypic Prevalence of the S64F MafA Mutation

RELEVANT COURSEWORK

BME 318: Biomaterials **Fall 2025**
Arizona State University, Dr. Olivia Burnsed, Ph.D.
Final Grade: A+
The final project involved writing a paper and giving a brief presentation on the uses of decellularization in xenotransplantation, as well as the potential toxicity effects of using sodium dodecyl sulfate in decellularization and the biointegration of the implant.

BME 2301: Systems Physiology I **Spring 2025**
Vanderbilt University, Dr. Mikail Rubinov, Ph.D.
Final Grade: A
The final project integrated data from single-cell RNA sequencing of mouse islets from my work in Dr. Jeeyeon Cha's lab. I used MATLAB to analyze the scRNA-seq data of 6 mice, with or without a genetic mutation, to identify differentially expressed genes between groups and gave a presentation on the background and results.

BME 2100: Biomechanics **Fall 2024**
Vanderbilt University, Dr. David Merryman, Ph.D.
Final Grade: A-

TEACHING and MENTORING

Andrew Spittell, Laboratory of Dr. Jeeyeon Cha, M.D., Ph.D. **Summer 2025**
Medical Student, University of San Diego
Current Status: Medical Student, University of San Diego

Sarah Cobb, Laboratory of Dr. Jeeyeon Cha, M.D., Ph.D. **Summer 2025**
Undergraduate Biochemistry Student, Davidson University
Current Status: Undergraduate Biochemistry Student, Davidson University

Nala Hamilton, Laboratory of Dr. Jeeyeon Cha, M.D., Ph.D. **Fall 2024**
Interdisciplinary Graduate Studies Rotational Student, Vanderbilt University
Current Status: Molecular Physiology and Biophysics Graduate Student, Vanderbilt University

Micaela Maxwell, Laboratory of Dr. Jeeyeon Cha, M.D., Ph.D. **Fall 2024**
Interdisciplinary Graduate Studies Rotational Student, Vanderbilt University
Current Status: Molecular Physiology and Biophysics Graduate Student, Vanderbilt University

Haley Kling, Warren Center for Neuroscience Drug Discovery **June 2023-June 2024**
Research Specialist, WCNDD
Current Status: Clinical/Translational Research Coordinator III, VUMC

Natasha Billard, Warren Center for Neuroscience Drug Discovery **August 2022-January 2024**
Research Specialist, WCNDD
Current Status: Clinical/Translational Research Coordinator III, VUMC

Lauren Parr, Warren Center for Neuroscience Drug Discovery **August 2022-June 2023**
Research Assistant II, WCNDD
Current Status: Pharmacology Ph.D. Candidate, Vanderbilt University

Lucy Houghton, Warren Center for Neuroscience Drug Discovery **August 2022-June 2023**
Research Technician, WCNDD
Current Status: Research Scientist, MicroBio Engineering Inc.

ADDITIONAL PROFESSIONAL and LEADERSHIP EXPERIENCE

Undergraduate Neuroscience Peer Reviewer **Spring 2020-Spring 2021**
IMPULSE Undergraduate Neuroscience Journal

- Evaluated undergraduate neuroscience research articles and gave feedback and revisions.

Peer Tutor **Spring 2019-Fall 2020**
University of North Carolina at Chapel Hill

- Taught pre-calculus to a class of 15 high school students, generating weekly lesson plans and worksheets.
- Tutored students in chemistry, math, physics, and French.

Blank Canvas Dance Company **2019-2021**
University of North Carolina at Chapel Hill

- Participated in a student-run dance organization on campus.
- Choreographed dances both by myself and alongside other students, teaching the dances to groups of 10-30 members over the course of a semester, culminating in a showcase.

UNC Cheerleading Team **2017-2019**
University of North Carolina at Chapel Hill

- Supported UNC athletics at football and basketball games, gymnastics and wrestling events, and more.
- Acted as an ambassador for the University, meeting with donors before games, volunteering during kid's camps, and organizing/participating in fundraisers.
- Mentored newer members during my second year, taking on a leadership role within the team.