

# Alexandria N. Hughes, PhD, MS

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## Education

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Sep 2020 | **PhD, Neuroscience** *University of Colorado, Anschutz Medical Campus*

Aug 2023 | **MS, Statistics** *Texas A&M University*

Dec 2014 | **BS, Biology; Mathematics minor** *Boise State University*

## Work Experience

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- 10/2023 - | **Data Scientist** *National Institutes of Health Clinical Center (NIH/CC)*
- Collaborative statistics and data science consultant for investigators in the Translational Biobehavioral and Health Disparities Branch
- 12/2022 - 10/2023 | **Mathematical Statistician** *National Science Foundation (NSF/NCSES)*
- Provided statistical review and consultation services for NCSES surveys, publications, and reports, including the Survey of Earned Doctorates, Diversity and STEM, and the Annual Business Survey in collaboration with the Census Bureau
- 10/2021 - 11/2022 | **Senior Biostatistician** *Westat, Public Health & Epidemiology*
- Designed and performed statistical analyses in R for contracted epidemiological studies - emphasis on survival analysis & mixed models, wrote statistical analysis plans and scientific manuscripts, managed data dictionaries, cloud computing (AWS)
- 8/2015 - 10/2021 | **Graduate & Postdoctoral Training** *University of Colorado; National Institutes of Health (NIH/NICHD)*
- Computational: Daily use of R, coursework in R, Python, and MATLAB, RNA- and scRNA-seq data clustering & batch correction methods, image analysis, neuronal circuit modeling & simulation
  - Biology: Genetics, molecular cloning, CRISPR, microscopy, zebrafish
- 5/2011 - 7/2015 | **Adjunct Faculty, Teaching Assistant, & Tutor** *Boise State University, Dept of Mathematics*
- Taught 2 sections of Elementary Algebra, TA'ed 2 sections of Calculus II and 3 sections of Calculus III, and provided drop-in tutoring services for the dept (30 h/week)

## Computational Skills

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<b>Programming</b>	Expertise in R (2016 - current), proficiency in Python and SAS, basic familiarity with Julia
<b>Statistics</b>	Regression modeling (GLM, GLMM), biostatistics (survival analysis, mixed models), Bayesian approaches (MCMC, rstan, brms), statistical/machine learning (ensemble methods, clustering)
<b>Markup</b>	LaTeX, Markdown, basic HTML/CSS
<b>Bioinformatics</b>	Bioconductor, RNA- and scRNA-seq analysis (scater, scan, edgeR, DEseq2) and Seurat, UCSC Genome Browser, NCBI, Ensembl, Image analysis (ImageJ)
<b>Visualization</b>	Data visualization (ggplot2, matplotlib, Shiny), vector graphics & scientific illustration (Inkscape)
<b>Other</b>	RStudio, Git, Jupyter, Quarto, writing, teaching & presenting, communicating mathematical & statistical concepts to non-technical audiences, project management and strategy

## Membership & Certification

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- COR (Contracting Officer's Representative) I certification
- SAS 9.4 Certified Associate
- Member, American Statistical Association

## Achievements

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- University of Colorado School of Medicine Dean's Outstanding Dissertation Award, 2021: Dean's selected dissertation of the 2020-2021 doctoral graduating classes
- National Science Foundation Graduate Research Fellowship Program (NSF-GRFP) awardee, 2016: funded my tuition and stipend for 3 years of my PhD

## Publications

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- Stone M, Spencer BR, Warden DE, Fink RV, Saa P, Leddy J, Mulach-Vannoy J, Townsend R, Krzysztof D, **Hughes AN**, Di Germanio C, ..., Norris PJ (2024). Patient and immunological factors associated with delayed clearance of mucosal SARS-CoV-2 RNA and symptom persistence. *The Journal of Infectious Diseases*, jiae132.
- DeSilva MB, Knowlton G, Rai NK, Bodurtha P, Essien I, Riddles J, Mehari L, Muscoplat M, Lynfield R, Rowley EAK, Chamberlain AM, Patel P, **Hughes A**, ..., Drawz PE (2023). Vaccine Effectiveness Against SARS-CoV-2 Related Hospitalizations in People who had Experienced Homelessness or Incarceration—Findings from the Minnesota EHR Consortium. *Journal of Community Health*, 1-10.
- Stone M, Fink R, Saa P, **Hughes A**, Di Germanio C, Spencer B, ..., Norris P (2023). RNA Persistence, Antibody Dynamics and Symptom Outcomes in a Longitudinal Cohort of Persons Infected with SARS-CoV-2. *Transfusion*, 63, 64A-65A.
- Adams K, Riddles JJ, Rowley EAK, Grannis SJ, Gaglani M, Fireman B, Hartman E, Naleway A, Stenehjem E, **Hughes A**, ..., Tenforde MW (2023). Number needed to vaccinate with a COVID-19 booster to prevent a COVID-19-associated hospitalization during SARS-CoV-2 Omicron BA.1 variant predominance, December 2021–February 2022, VISION Network: a retrospective cohort study. *The Lancet, Regional Health - Americas* 23, 100530.
- Lopransi B, Davis JM, Gavina KC, Relich RF, Dunne MM, **Hughes AN**, Stenehjem E, Link-Gelles R, Tenforde MW, Britton A (2023). Association of mean real-time PCR cycle threshold values between care settings and vaccination status of persons testing positive for SARS-CoV-2 infection during Delta (B.1.617.2) and Omicron (BA.1, BA.2, BA 4/5) variant periods. *Under review / CDC clearance*.
- Andreev A, Komatsu V, Almiron P, Rose K, **Hughes AN**, Lee MY (2022). Research Culture: Welcome to the lab. *eLife*, 11:e79627.
- **Hughes AN** (2022). In search of a backup career plan, I found a perfect fit. *Science (New York, NY)*, 376(6589), 210-210.
- **Hughes AN** (2021). Glial cells promote myelin formation and elimination. *Frontiers in Cell and Developmental Biology*, 9, 661486.
- **Hughes AN** & Appel B (2020). Microglia phagocytose myelin sheaths to modify developmental myelination. *Nature Neuroscience*, 23, 1055–1066.
- **Hughes AN** & Appel B (2019). Oligodendrocytes express synaptic proteins that modulate myelin sheath formation. *Nature Communications*, 10(1), 1-15.
- **Hughes AN**, Oxford A, Tawara K, Jorcyk C, Oxford JT (2017). Endoplasmic reticulum stress and unfolded protein response in cartilage pathophysiology; contributing factors to apoptosis and osteoarthritis. *International Journal of Molecular Sciences*, 18(3), 665.
- **Hughes AN**, Hixon AM, Josey M (2016). A Schwanncentric View of Axon Arborization in Neuromuscular Junction (NMJ) Formation. *Journal of Neuroscience*, 36(38), 9760-9762.
- **Hughes AN** & Oxford JT (2014). A lipid-rich gestational diet predisposes offspring to nonalcoholic fatty liver disease: a potential sequence of events. *Hepatic Medicine*, 6, 15-23.