Ryan Gallagher

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Education

University of Wisconsin - Eau Claire *Sept 2017 – Dec 2021*
BS in Statistical/Applied Mathematics & Applied Physics, double major

Medical College of Wisconsin *Sept 2022 - Dec 2023*
MA in Biostatistics & Data Science

Relevant Coursework

- **Graduate:** Statistical Modeling Series, Statistical Computing, Bayesian Analysis, Bioinformatics
- **Undergraduate:** Statistics & Probability, Linear Algebra, Calculus Series, Differential Equations, Numerical Analysis, Programming in C++, University Physics Series, Real Analysis, Complex Analysis

Research Experience

Biostatistician I *Milwaukee, WI*
Medical College of Wisconsin / Children's Wisconsin *Jan 2024 - Present*

- Primary Biostatistician supporting Dr. Ulrich Broeckel in the MCW/CW Advanced Genomics lab.
- Designed statistical QC reporting for a CAP-accredited genomics laboratory, monitoring lab instrument performance and data integrity using R.
- Directed research initiatives in biostatistics, bioinformatics, and programming.

  Whole Genome Long-Read Sequencing Bioinformatics Pipeline github.link
  - Created a Git-versioned Python pipeline converting raw whole-genome long-reads into analysis-ready data, processed $\sim$ 100 genomes to date.
  - Developed a variant annotation and analysis workflow to quantitatively identify clinically relevant mutations for determining disease association.

  Differential Expression Analysis for Drug Discovery github.link
  - Performed differential expression analysis in R (DESeq2) to statistically validate and quantify the efficiency of gene knockouts at the transcriptomic level in our TKI therapeutic research.

  Hybrid Assembly of Oxford Nanopore Long-Read Sequencing & Bionano Optical Genome Mapping github.link
  - Developed a workflow which combines two third-generation sequencing platforms for the construction of highly contiguous genome assemblies.
  - Assemblies yield gap-reduced, end-to-end reconstructions that better approximate the complete genome.

Graduate Research Assistant *Milwaukee, WI*
Medical College of Wisconsin *Jan 2023 - Dec 2023*

- Assisted Dr. Rodney Sparapani on pediatric Sickle Cell research leveraging multi-institutional EHRs.

  Quantile Regression for Sickle Cell Pediatric Growth Patterns github.link
  - Performed advanced statistical modeling in SAS on TriNetX EMR data to uncover pediatric disparity factors (Master's Capstone).

Data Analyst Intern *Madison, WI (Remote)*
WPS Health Solutions *April 2023 - Dec 2023*

- Queried and analyzed large datasets from the CMS Medicare Claims database using SAS, SQL, & Python.
- Conducted statistical investigations on Medicare claims data to identify healthcare utilization patterns and potential fraud anomalies, supporting evidence-based policy and health services research initiatives.

Teaching Experience

Adjunct Professor *Milwaukee, WI*
University of Wisconsin - Milwaukee *Spring 2025*

- Designed & instructed: *Healthcare Informatics 743 – Predictive Analytics in Healthcare.* LINK TO GITHUB
- Taught 18 graduate level students the basics of R programming, regression, and statistical learning.
- Developed a course curriculum with integrated labs, homework, and term projects for statistical analysis in various healthcare data.

Academic Tutor *Milwaukee, WI*
Tutor Doctor *Sept 2022- Dec 2022*

- Tutored three individuals at the high school and college level in calculus & precalculus.
- Developed personalized lesson plans and practice materials tailored to student learning styles.

Publications

1. **Gallagher et. al**, "Optical Genome Mapping and Long Read Sequencing Identifies a Novel Dystrophin Gene Inversion in a Patient with Duchene's Muscular Dystrophy", *American Journal of Medical Genetics - Part A*, (Submitted, November 2025)

2. **Ries et. al**, "Optical Genome Mapping and Long Read Sequencing identifies a complex PAX6 rearrangement causing aniridia", *JAMA Opthamology*, (Submitted, October 2025)

Scholarly Presentations

- **Gallagher et. al**, "Optical Genome Mapping and Long Read Sequencing Identifies a Novel Dystrophin Gene Inversion in a Patient with Duchene's Muscular Dystrophy", Oral Presentation, American College of Medical Genetics, Boston Convention and Exhibition Center, Boston, MA, October 2025.

- **Gallagher et. al**, "Optical Genome Mapping and Long Read Sequencing Identifies a Novel Dystrophin Gene Inversion in a Patient with Duchene's Muscular Dystrophy", Oral Presentation, Midwest Society of Pediatric Research, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, July 2025.

- **Gallagher, Ryan J**, "Pediatric Disparities in Sickle Cell Disease and Quantile Regression for Childhood Growth Charts with a Multi-institutional Databank of Electronic Health Records", Oral Presentation, Master's Capstone Seminar, Medical College of Wisconsin, Milwaukee, WI, December 2023

Skills

Languages: R, Python, SAS, bash, SQL, C++

Computing Linux, docker, Git/GitHub, RStudio, conda, SLURM

Bioinformatics & Statistical Genetics: DeepVariant, bcftools, GATK, RNA-seq (DESeq2, edgeR), snpEff, VEP; ONT/Bionano,. VCFtools, BEDTools, IGV

Data Visualization & Reporting: R Markdown / Quarto, ggplot2, plotly, seaborn, Interactive Dashboards (Shiny, Dash), LaTeX