

MEGAN HALL

EDUCATION

MS Biostatistics

2024

Vanderbilt University

Thesis: Sample Size Considerations in Intensive Longitudinal Data

I wrote my thesis based on sample size considerations for sleep studies. I determined how the number of breaths per experimental condition affected the treatment effect via simulations. I also determined how the number of patients affected the treatment effect via bootstrap. Based on the results of this project, the research team will be testing different experimental designs.

BS Biochemistry

2022

Western Kentucky University

Thesis: The Role of Dichloro(ethylenediamine)platinum II in Altering Cellular Iron and Copper Transport

My thesis investigated a possible mechanism for dichloro(ethylenediamine)platinum II (a platinum-based chemotherapeutic) into cancer cells. I determined if exposing cells to the platinum compound affect the accumulation of other metals (iron and copper) within the cells. I conducted both biochemical assays and statistical analysis for the thesis.

EXPERIENCE

Biomedical Data Science Assistant

Oct 2024 - present

Department of Biostatistics, University of Kentucky

Graduate Research Assistant

Jun 2023 - Aug 2024

Department of Biostatistics, Vanderbilt University

- Built R Shiny app for data processing and visualization
- Integrated Python functions in R Shiny app
- Designed and managed PostgreSQL database in AWS
- Implemented mixed-effect regression models
- Conducted sensitivity analysis for sampling rate
- Compiled statistical analysis reports

Graduate Student Researcher

Aug 2022 - Aug 2024

Department of Biostatistics, Vanderbilt University

- Analyzed data from studies involving missing, longitudinal, and survey data
- Conducted spatial analysis, linear regression, logistic regression, and inverse probability of attrition weighting
- Developed and executed statistical analysis plans
- Collaborated with teams of 2-4 biostatisticians
- Delivered results presentation to clinical investigators

EXPERIENCE

Research Assistant

Jun 2019 - Dec 2022

Department of Chemistry, Western Kentucky University

- Conducted metabolic and spectrometry assays
- Compiled database of transport proteins
- Developed R program to calculate dose-response curves
- Completed organization and analysis of data collected over five years
- Analyzed data for toxicology paper (publication pending)
- Communicated weekly lab progress with supervisor
- Presented 2 posters (1 national, 1 local conference) (see Publications)

Teaching Assistant

Jan 2019 - Sept 2020

Department of Chemistry, Western Kentucky University

- Supervised students following lab procedure
- Maintained laboratory safety
- Prepared laboratory for experiments
- Taught 100+ students

Research Intern

Jun 2021- Jul 2021

Iowa Summer Institute of Biostatistics, University of Iowa

- Analyzed Ecological Momentary Assessment (EMA) data
- Performed principal components analysis and factor analysis
- Presented research at symposium (see Publications)

AWARDS

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| Vanderbilt Graduate Tuition Award | 2022-2024 |
| Outstanding Chemistry Major | 2022 |
| David and Sandra Hartman Scholarship | 2021-2022 |
| Department of Chemistry Scholarship | 2020-2021 |
| Kentucky Education Excellence Scholarship | 2018-2022 |
| Western Kentucky University Academic Merit Scholarship | 2018-2022 |

PUBLICATIONS

Posters

Hall, M.*, Miller, A., Olajuwon, S., Lewis, A., Williams, B. B., "Role of Dichloro(ethylenediamine)platinum II in Cellular Iron Transport." Annual Meeting, Western Kentucky Student Research Conference, March 26, 2022. (*presenting authors)

PUBLICATIONS

Posters

Hall, M.*, McGowan, D.*, Oleson, J., Jay, M., “Relating Hearing Rehabilitation for Age Related Hearing Loss to Cognitive Decline.” Annual Meeting, Iowa Summer Research Symposium, Virtual, July 22, 2021. (*presenting authors)

Hall, M.*, Freeman L., Schlabach J., Duke B., Williams, B. B., “The Role of Non-leaving Ligands in Cell-type Specific Toxicity of Platinum (II) Compounds.” Annual Meeting, Society of Toxicology, Virtual, March 12-26, 2021. (*presenting author)

Olajuwon, S.*, Veletanlic V., Schlabach J., **Hall M.**, Williams, B. B., “Impact of Platinum (II) Compound Structure on Tissue-Specific Cell Survival in Models of Human Cancer.” Annual Meeting, Society of Toxicology, Virtual, March 12-26, 2021. (*presenting author)

Schlabach, J.*, McManus, J.*, Freeman, L., **Hall, M.**, Williams, B. B., “The Impact of Structural Modification of Oxaliplatin on Cell Survival.” Annual Meeting, Society of Toxicology, Anaheim, CA, Spring 2020, Meeting Cancelled. (*presenting author)

PROGRAMMING

- **R** for statistical analysis, data visualization, and data wrangling
 - **ggplot2** and **tidyverse**
 - **RStudio** and **RShiny**
- **Python**
- **Git/GitHub** for version control
- **SQL, AWS** for database creation and management
 - **PostgreSQL** and **SQLite**
- **Markdown** and **LaTeX** for report and manuscript preparation
- **SAS** and **Stata** for statistical analysis
- **POSIT Workbench**
- **Redcap**