

CIRCE MCDONALD

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SKILLS

Languages: R (Bioconductor, tidyverse), Python, SQL, Bash*, Java*, C*

Data visualization: Adobe Creative Suite, Tableau, Plotly, RShiny, ArcGIS*,

Statistical analysis: multilevel models, high-dimensional data, generalized linear mixed models, normalization and transformation procedures, experimental design, vital and medical record analysis, survival analysis

Subject area expertise: virology, genetics, emerging infectious disease, disease surveillance

* Indicates familiarity with but not proficiency.

EXPERIENCE

Gilead Sciences

Foster City, CA

Clinical Data Scientist

January 2019 – Present

- Conducted exploratory and formal statistical analysis in support of multiple phases of clinical trials in the areas of HBV and HIV using R and Python.
- Conducted variety of bioinformatic analyses including GWAS, single cell, and microbiome.
- Led pipeline working group to automate data processing on both PBS clusters and Azure Kubernetes. Contributed to data warehouse development efforts for group. Lead team in conjunction with IT implementing Airflow workflow management system on enterprise level.
- Part of team competing in the Innocentive AstraZeneca Challenge: Automated Detection and Quantitation of Bone Marrow Cells using PyTorch

Clinical Data Management Associate

March 2018 – January 2019

- Independently developed and implemented daily quality control reports for rapid assessment of newly received clinical data in python. Aggregated metrics from these reports to inform vendors and vendor managers of pain points.
- Produced a variety of small automation scripts to improve response times and reduce reoccurring workloads.
- Developed and maintained controlled terminology for all biomarker scientists.
- Drafted data transformation specifications for numerous studies allowing standardization of data structure.

Pulendran Lab, Emory University/Stanford University

Atlanta, GA/Palo Alto, CA

Life Science Research Associate II

February 2017 – March 2018

- Created data repository of 15 years and 50TB of laboratory records. Coordinated digitalization and unification of data from a wide variety of media. Using an R pipeline, increased searchability of repository through associating document metadata to lab publication record obtained via NCBI Entrez tools.
- Collaborated with senior bioinformaticians to pilot and implement laboratory information management system (LIMS), LabKey, to support *in vitro*, *in vivo*, and clinical applications.
- Collaborated with senior bioinformaticians to improve computational efficiency of clinical trial analysis pipeline and create dashboards for immunology researchers using R and MatLab.
- Transitioned lab from individually maintained records to an electronic laboratory notebook, SciNote, enabling collaboration and ensuring legal compliance with documentation standards.
- Managed the transition of laboratory between institutions including biosafety compliance, training of new staff, and reestablishment of mouse colony. Integrated Trello, Slack, Google Drive, and Quartzly to improve laboratory management during this transition.
- Transitioned mouse colony management from Excel to a commercial relational database (SoftMouse). Worked with SoftMouse team to develop Python scripts for automated image labeling and uploading.

Suthar Lab, Emory University

Atlanta, GA

Senior Research Specialist

September 2015 – February 2017

- Performed quantitative trait loci analysis (maximum likelihood and regression analyses of high-dimensional genomic data) in R utilizing Collaborative Cross model in collaboration with Martin Ferris at UNC-Chapel Hill. Established transformation and normalization pipeline correcting for previously violated assumptions of normality and linearity. Corrected for batch effects using mixed effect model.
- Validated and revised SOPs for DMID clinical trial for Ebola vaccine ‘omics (transcriptomics, proteomics, metabolomics, and lipidomics) sample collection.
- Developed and conducted a 10 individual, 140 sample pilot study to further optimize sample processing protocols. Coordinated with four specialized research cores, six research laboratories, and medical clinicians to collect donor samples, process materials, and analyze study data.
- Transitioned lab from Excel based mouse colony management to customized MySQL database.
- Provided statistical support for grant applications, experimental designs, and peer review.

Division of Parasitic Disease and Malaria, CGH, CDC

Atlanta, GA

IHRC Microbiologist

September 2014 – September 2015

APHL EID Training Fellow

September 2013 – September 2014

- Utilized sera from a five-year longitudinal study of chimpanzee filarial infection to model immune response of seven antibodies to three antigens using multiplex assay.
- Obtained 40 out of targeted 47 infant samples during three weeks of fieldwork in Lima, Peru through collaboration with PRISMA.
- Proposed and validated novel colorimetric dried blood spot degradation measurement protocol.
- Completed sensitivity and specificity studies for two newly developed diagnostic tests.
- Collaborated with group members to provide high quality laboratory testing supporting monitoring efforts in four nations with 500 individuals tested in each country.

EDUCATION**Georgia Tech**

January 2020 – May 2023 (Expected)

Master of Computer Science

University of Pennsylvania

August 2019 – December 2020

Master of Computer and Information Technology

(4 out of 10 courses complete)

Georgia State University

August 2015–May 2017

M.P.H. Biostatistics

Thesis: “Preprocessing Strategies for Multiplex Bead Assay Data for Use in Quantitative Trait Loci Analysis”

Dominican University of California

August 2009-May 2013

B.S. Biology with an emphasis in Molecular Cell Biology

Minors: Chemistry and Philosophy

SELECTED PUBLICATIONS

J.R. Bowen, K.M. Quicke, M.S. Maddur, J.T. O’Neal, **C.E. McDonald**, N.B. Fedorova, V. Puri, R.S. Shabman, B. Pulendran, M.S. Suthar. “Zika Virus Antagonizes Type I Interferon Responses During Infection of Human Dendritic Cells.” *PLOS Pathogens*. February 02, 2017.

K.M. Quicke, J.R. Bowen, E.L. Johnson, **C.E. McDonald**, H. Ma, J.T. O’Neal, A. Rajakumar, J. Wrammert, B.H. Rimawi, B. Pulendran, R.F. Schinazi, R. Chakraborty, M.S. Suthar. “Zika Virus Infects Human Placental Macrophages.” *Cell Host Microbe*. July 13, 2016.

Full publication list: