

CURRICULUM VITAE

John Lawson

Education

University of Virginia, Fall 2016-present
PhD, Biomedical Engineering
GPA: 3.82, Scale: 4.0

Liberty University, 2016
Bachelor of Science, Biochemistry and Molecular Biology; Minor: Mathematics
GPA: 4.0, Scale: 4.0

Honors/Awards

2019-2020	UVA Cancer Center Trainee Grant
2017-2019	Biomedical Data Sciences Training Grant, UVA
2018	Travel Award and Selection for ISMB BD2K Young PI Session
2016	Outstanding Biochemistry and Molecular Biology Graduate
2012	College-sponsored National Merit Scholarship
2012-2016	Modern Woodmen of America Scholarship
2012-2016	Liberty University Honors Program and Honors Program Scholarships
2012-2016	Dean's List, Liberty University

Publications

John T Lawson, Eleni M Tomazou, Christoph Bock, Nathan C Sheffield. MIRA: an R package for DNA methylation-based inference of regulatory activity, *Bioinformatics*. March 1, 2018. <https://doi.org/10.1093/bioinformatics/bty083>

Software

COCOA Bioconductor package: <http://bioconductor.org/packages/COCOA>. An R package for identifying sources of inter-sample variation in genomic coordinate-based data such as DNA methylation and ATAC-seq.

MIRA Bioconductor package: <http://bioconductor.org/packages/MIRA>. An R package for methylation-based inference of regulatory activity. I am an author and the package maintainer.

Research Experience

Graduate Research Assistant, computational biology lab of Dr. Nathan Sheffield, Spring 2017-present

Biomedical Engineering Ph.D. Program, University of Virginia

- Current project: Gene regulation in acute myeloid leukemia.
- Previous project: Developed the COCOA R/Bioconductor package which identifies sources of interindividual variation for genomic coordinate-based epigenetic data such as DNA methylation and ATAC-seq. Accepted to the Bioconductor software repository. Ongoing work to improve package and expand functionality.

- Previous project: Helped develop the MIRA R/Bioconductor package which infers regulatory activity from DNA methylation data. Accepted to the Bioconductor software repository.

Undergraduate Student Researcher, Liberty University, Spring 2014-Spring 2016

Department of Biology and Chemistry (Dr. Gary D. Isaacs)

Research Experience: Investigated what transcription factors may be involved in regulating epigenetically altered and differentially expressed genes in a mouse model of Alzheimer's disease.

Student Volunteer, Environmental Protection Agency (EPA), June 28–August 13, 2015,

Part of Summer 2016

National Health and Environmental Effects Research Laboratory (NHEERL),

Integrated Systems Toxicology Division (ISTD) (Dr. Hisham El-Masri)

Research Experience: Adapting an R workflow based on the work of Dr. Mohamed AbdulHameed from the Biotechnology High Performance Computing Software Applications Institute to take toxicology microarray data from the DrugMatrix database, perform quality control, and determine differentially expressed genes and coexpressed genes for a subset of chemicals.

Summer Intern, National Institute on Aging (NIA), June 02-August 8, 2014

Laboratory of Molecular Biology and Immunology

Antibody Diversity Section (Dr. Patricia Gearhart)

Research Experience: Helped to define the role of activated B cells in tertiary lymphoid organs in an atherosclerosis mouse model. I used immunology and molecular biology techniques to investigate the antibody repertoire of this group of cells.

Teaching

Co-instructor: “Genomics & Enrichment Analysis: Tools for region-based genomic analysis” workshop, June 25, 2019

During the international Bioconductor 2019 conference, I taught half of this workshop session detailing tools developed by the Sheffield lab, including COCOA.

Instructor: Introduction to Git/Github Workshop, February 22, 2018

Taught a workshop through UVA research technology workshop series offered to students, faculty, and staff.

Service

Graduate Diversity Action Committee, UVA Biomedical Engineering Department, July 2017-2018: the group devises policy and outreach to promote inclusion and diversity in the department.

Mentorship Committee Chair, Scientific Research Society, Liberty University, Spring 2016

Guided the creation and implementation of a research mentorship program.

Student Volunteer: Environmental Protection Agency, June 28-August 13, 2015
Volunteered over 140 hours, description above

Technical Skills

R (4+ years)	Working with containers
Git/Github	Effectively organizing research projects
Bash	Working in a high-performance computing environment
Machine learning	
Data visualization	R package development and maintenance

Presentations

Oral presentations:

“Coordinate Covariation Analysis (COCOA): Understanding Interindividual Variation in Data with Genomic Coordinates”

Bioc2019 Bioconductor Conference, June 25, 2019

“Principal Component Region Set Analysis: Facilitating Interpretation of PCA Dimensions for DNA Methylation Data”

ISMB2018, BD2K Young PI Session, July 7, 2018

“MIRA: an R Package for Inferring Regulatory Activity from DNA Methylation Data”

Bioc2017 Bioconductor Conference (Developer Day), July 26, 2017

“Using DNA Methylation Data for Computational Inference of Regulatory Activity”

Virginia Academy of Science Annual Meeting, May 18, 2017

“Motif Enrichment Analysis of Differentially Expressed Genes in Alzheimer’s Disease Identifies SREBP2 As Possible Transcriptional Regulator”

Virginia Academy of Science Annual Meeting, May 19, 2016

“Transcriptional Regulators of Epigenetically Altered Genes in Alzheimer’s Disease”

Big South Undergraduate Research Symposium, April 10, 2015

Posters:

“Coordinate Covariation Analysis (COCOA): Understanding Interindividual Variation in Data with Genomic Coordinates”

Bioc2019 Bioconductor Conference, June 2019

RECOMB2019, May 6, 2019

“Principal Component Region Set Analysis: Facilitating Interpretation of PCA Dimensions for DNA Methylation Data”

ISMB2018, July 9-10, 2018

“Transcriptional Regulators of Differentially Expressed Genes in Alzheimer’s Disease”
Southern Regional Honors Council, Spring 2016

“Transcriptional Regulation of Differentially Expressed Genes in Alzheimer’s Disease”
Virginia Academy of Science Fall Undergraduate Research Meeting, Fall 2015

“Transcriptional Regulators of Epigenetically Altered Genes in Alzheimer’s Disease”
Virginia Academy of Science Annual Meeting, Spring 2015
Big South Undergraduate Research Symposium, Spring 2015

“Transcription Factor Enrichment Analysis for Differentially Methylated and Differentially Expressed Genomic Regions in Alzheimer’s Disease”
Virginia Academy of Science Fall Undergraduate Research Meeting, Fall 2014

“Elucidating the Activated B Cell Response in Atherosclerosis”
National Institute on Aging Poster Day, Summer 2014
NIH Summer Research Program Poster Day, Summer 2014

“Bioinformatics and Transcription Factors Related to Alzheimer’s Disease”
Liberty University Undergraduate Research Symposium, Spring 2014

Funding

UVA Cancer Center Trainee Grant, 2019-2020
Transdisciplinary Big Data Science Training at UVA, 2017-2019 (grant number:
5T32LM012416)