Spencer Nystrom

snystrom | ORCiD

Education

PhD, Genetics & Molecular Biology Aug. 2015 – June 2021
University of North Carolina *Chapel Hill, NC*
- Advisor: Daniel J. McKay

B.A. Biology (Cellular & Molecular Emphasis) Aug. 2011 – May 2015
Austin College *Sherman, TX*
- German (Minor)
- Magna Cum Laude

Experience

Data Scientist June. 2021 – Present
Locus Biosciences *Research Triangle Park, NC*

Graduate Research Student August 2015 – June 2021
Advisor: Dr. Daniel J. McKay *UNC Chapel Hill*
- Integrated multiomic datasets to investigate molecular mechanisms of development, resulting in 2 co-first author publications
- As the computational lead on two independent projects, collaborated with bench scientists to design data-driven experiments testing computational predictions
- Built automated reports of computational methods & results for non-expert recipients
- Designed & built scalable, distributed analysis pipelines for reproducible processing of RNA-, ATAC-, FAIRE-, ChIP-seq, and CUT&RUN data using Snakemake, Python, & R
- Developed custom software for genomics data analysis using R and Rust (see "Software" below)
- Independently designed and carried out wetlab experiments including: *Drosophila* genetics, *in-vivo* enhancer activity assays, genomics bench experiments & associated library preps

Independent Genetics Research Student August 2013 – May 2015
Advisor: Dr. David Aiello *Austin College*
- Designed & carried out independent research project identifying gene expression signatures under multiple conditions using RNAseq & qPCR
- Computationally predicted candidate DNA binding proteins & gene regulatory elements responsible for gene signatures for subsequent validation

Summer Undergraduate Research Fellow June 2013 - August 2013
Advisor: Dr. Joseph Garcia *University of Texas Southwestern*

Soil Ecology & Microbiology Research Student June 2012 - June 2013
Advisors: Dr. Kelynne Reed & Dr. Keith Kisselle *Austin College*
- Analysis of soil microbial communities using 16s rRNA TRFLP
- Developed methods for culture & genetic manipulation of a novel soil bacterium

Awards & Honors

Best Graduate Student Poster UNC Genetics Retreat 2019
Best Talk Triangle Fly Symposium 2018
Best Graduate Student Poster Triangle Fly Symposium 2017
Best Undergraduate Student Poster Texas Genetics Society 2015
Phi Beta Kappa Austin College 2015

Teaching

R for Data Analysis June - July 2018, June 2019
How to Learn to Code Series *UNC Chapel Hill*

- Designed & taught course for graduate students and post-docs

Learn to Code Python 3 June 2017 - July 2017
How to Learn to Code Series *UNC Chapel Hill*

ATAC-seq & ChIP-seq data analysis workshop June 2017
UNC Center for Bioinformatics *UNC Chapel Hill*

- Designed & led 3 day workshop teaching graduate-students, post-docs, and UNC faculty how to process and analyze ATAC-seq data
- Taught introduction to R programming, plotting, and other sequencing analysis tools
- Assisted teaching students to use UNC compute resources

Software

memes: an R wrapper for the MEME Suite
cmdfun: Build seamless commandline wrappers in R
bamf: Manipulate sequencing reads by fragment size
rd4tools: Create & read d4 files in R

Skills

Programming Languages: R, Python, Bash, Rust, Julia
Bioinformatics Skills: Clustering & dimensionality reduction, exploratory data analysis, linear modeling, applied statistics, sequencing data normalization, motif analysis, gene ontology analysis, gene set enrichment analysis
Bioinformatics Tools: Bowtie2, Salmon, Star, Samtools, rust-htslib, Picard tools, Bedtools, Deeptools, DESeq2, tximport & tximeta, GRanges
Development Tools: Rmarkdown, Git, Github Actions, Snakemake, Targets, Slurm, LSF, Docker, Singularity
Spoken Languages: German

Publications

Nystrom, Spencer L. and Daniel J. McKay. Memes: an r interface to the meme suite. 2021. doi: 10.1101/2021.04.23.441089.

Robin E. Harris, Michael J. Stinchfield, **Spencer L. Nystrom**, Daniel J. McKay, and Iswar K. Hariharan. Damage-responsive, maturity-silenced enhancers regulate multiple genes that direct regeneration in drosophila. eLife, 9:1–26, jun 2020. ISSN 2050084X. doi: 10.7554/eLife.58305.

Spencer L. Nystrom*, Matthew J. Niederhuber*, and Daniel J. McKay. Expression of E93 provides an instructive cue to control dynamic enhancer activity and chromatin accessibility during development. Development (Cambridge), mar 2020. ISSN 14779129. doi: 10.1242/dev.181909.

Christopher M Uyehara*, **Spencer L. Nystrom***, Matthew J Niederhuber, Mary Leatham-Jensen, Yiqin Ma, Laura A Buttitta, and Daniel J McKay. Hormone-dependent control of developmental timing through regulation of chromatin accessibility. Genes and Development, 31(9):862–875, may 2017. ISSN 15495477. doi: 10.1101/gad.298182.117.

*** denotes equal contribution**