Noor Sohail

Computational Biologist

https://github.com/nsohail19

EDUCATION

B.Sc Life Science Informatics
University of Michigan

Sep 2016 - May 2020

Relevant coursework: Intro Bioinformatics, Biochemistry, Data Structures & Algorithms, Discrete Math, Linear Algebra, Probability, Intro Real Analysis, Organic Chemistry, Web Systems, Foundations of Computer Science.

PUBLICATIONS

- Barriga FM, Tsanov KM, Yu-Jui Ho, **Sohail N**, et al. "Chromosome 9p21.3 Coordinates Cell Intrinsic and Extrinsic Tumor Suppression." *BioRxiv*, 2022.
- Vilseck JZ, **Sohail N**, Hayes RL, Brooks CL III. "Overcoming Challenging Substituent Perturbations with Multisite λ-Dynamics: A Case Study Targeting β-Secretase 1." *J Phys Chem Lett*, 2019.
- Triska P, Kaneva K, Merkurjev D, **Sohail N**, Falk MJ, Triche TJ, Biegel JA, Gai X. "Landscape of Germline and Somatic Mitochondrial DNA Mutations in Pediatric Malignancies." *Cancer Research*, 2019.

RESEARCH EXPERIENCE

Computational Biologist
Single Cell Analysis Innovation Lab (SAIL) at Sloan Kettering Institute

Apr 2021 - Present

- Analyze scRNA-seq with current computational approaches such as dimensionality reduction, differential gene expression analysis, GSEA, and cell typing.
- Work closely with the Pe'er lab and SAIL wet lab to create pipelines/benchmark new single cell technologies and methods.
- Automate, maintain and run pipelines to process hundreds of sequencing and spatial transcriptomic samples using WDL, AWS, and docker.
- Investigating homologous gene families that are lowly expressed in scRNA-seq data and developing a method to retrieve their expression.
- Train wet lab biologists on how to analyze their data independently.
- Integrated 8 million PBMC single cells from various sources and single cell technologies to contrast methods of creating atlases for CZI..

Summer Research Intern
Cantley Lab at Weill Cornell Medicine
May 2020 – Aug 2020

- Mapped differential gene expression to proteins in order to investigate phosphorylation patterns.
- Ran tissue specific analyses on kinase-substrate relationships using data from GTEx, HPA, and CCLE.
- Generated differential equation models to predict rates of phosphorylation over time.

Undergraduate Researcher
Brooks Lab at the University of Michigan
Oct 2017 – Dec 2019

- Simulated interactions between proteins and ligands using computational chemistry techniques to determine free energies of binding.
- Contrasted two methods of alchemical molecular dynamics simulations for calculating free energies.

Summer Research Intern
Triche Lab at Van Andel Institute
May 2018 – Aug 2018 / May 2019 – Aug 2019

- Maintained and extended MTseeker, an R Bioconductor package that isolates variants in mitochondrial DNA, to trace lineages in single cell samples.
- Determined mitochondrial mutations found in cancer patients by comparing normal and cancerous samples.
- Manipulated VCF and BAM files generated by different bulk and single cell technologies (RNA-seq, ATAC-seq, WGS).
- Mentored students with no prior computer science experience on basic computational methods.

PRESENTATIONS _____

- <u>Sohail N</u>, Moorman A, Pe'er D. "SEACells: Using Single Cell Aggregation to Facilitate Data Integration" Oral presentation at *CZI Assembling Tissue References Workshop* (2022).
- <u>Sohail N</u>, Triche TJ. "Deconvolution with Mitochondrial Variation". Oral presentation at *Van Andel Institute Summer Internship Research Symposium* (2019).
- <u>Sohail N</u>, Triche TJ. "MTseeker: Mitochondrial Variant Analysis". Oral presentation at *Van Andel Institute Summer Internship Research Symposium* (2018).
- <u>Sohail N</u>, Triche TJ. "MTseeker: Mitochondrial Variant Analysis Tools for Bioconductor". Poster presentation at *Bioconductor* (2018).
- <u>Sohail N</u>, Vilseck JZ, Hayes RL, Brooks CL III. "Validating Lambda Dynamics for Computing Free Energy Differences". Poster presentation at *University of Michigan Undergraduate Research Opportunity Program Symposium* (2018).

TECHNICAL SKILLS _____

- Python, C++, R, SQL, bash scripting.
- LINUX/UNIX, git, Jupyter, WDL, LaTeX, AWS S3, HPC.
- Pandas, scanpy, Rapids, IGV, samtools.

WORK EXPERIENCE _____

Lab Prep Assistant
University of Michigan

Jan 2020 – Mar 2020

- Prepared reagents and materials for an advanced laboratory biology course at the University of Michigan.
- Operated an autoclave to sanitize and sterilize necessary glassware for the lab course.

Mathematics Tutor
University of Michigan

Jan 2018 – Apr 2018

- Mentored University of Michigan students one-on-one in Calculus 1 and 2 through the Office of Academic Multicultural Initiatives.

ACTIVITIES _____

Committee Director
Model United Nations at the University of Michigan

Sep 2016 – Mar 2020

- Aided in organizing a conference based on a mock United Nations for 500 high school students.
- Researched historic events to generate a written guide detailing relevant information for the committee.
- Oversaw a committee of 25 students, maintaining decorum and creating new topics of conversation for the given subject to broaden their viewpoint.

Writer
Wolverine CuiZine at the University of Michigan

Sep 2017 – Mar 2020

- Assisted in the organization and publication of the quarterly magazine Wolverine CuiZine, which included both infographics and written articles about food topics.
- Composed articles relevant to the theme of the edition.