Kritika Grover

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Education

University of Waterloo, Waterloo, Ontario   *Bachelor of Science, August 2024*
*Biochemistry***,** *Computing minor*

Cornell University, Ithaca, New York   *Doctorate of Philosophy, May 2028*
Computational Biology

Highlighted Coursework

- Fundamentals of Biochemistry, Advanced Biochemistry Laboratory, Structure and Bonding, Computational Biology, Genomics, Data types and Structures, Introductory Statistics for Scientists, Methods in Bioinformatics, Structural Bioinformatics, Computational Modelling of Cellular Systems, Data-Intensive Distributed Analytics

Academic Achievements

- Certified in Python through Waterloo's Professional Development course ed2go
- Dean's Honour List by achieving an overall cumulative average above 85
- Recipient of the Peter J. Belshaw Memorial Scholarship valued at $2,000

Relevant Experience

Research Student: *The Hospital for Sick Children, Toronto*   **January 2023 – August 2023**
- Developed a pipeline and open-source of command line tools, to predict pathogenicity of variants using AlphaFold2-Monomer.
- Created compelling visuals to be featured in a Cerebral Palsy research paper, showcasing the impact of the project's findings with valuable novel protein modeling and analyses.
- Contributed to a novel approach to predict disease mechanisms of de novo mutations in Cerebral Palsy by mastering AlphaFold2-Multimer and structural biology fundamentals, leading to new avenues for research.
- Designing and executed in vitro experiments to identify, validate, and characterize variants present in human DNA samples relating to autism spectrum disorder.
- Took initiative to analyze trends in the correlation of RNA-seq data and genetic variants present in autism spectrum disorder by proactively seeking out and undertaking a bioinformatics side project, demonstrating a strong commitment to professional development and a passion for staying current with industry trends.

Research Assistant: *Cornell University, Ithaca*   **May 2022 – August 2022**
- Executed transgenic approaches to elucidate and manipulate molecular mechanisms using techniques such as, RNA and protein analysis, production and analysis of recombinant enzymes.
- Performed (q-)PCR, Gel electrophoresis, SDS-PAGE, and Western Blotting on RNA, DNA, and Crispr Cas9 edited samples, analyzed results using Excel to produce and visualize trend data.
- Independently designed and delivered presentations regarding research updates and scientifically analyzed results to principal investigator and postdocs.

Analytical Chemist: *Sigma Analytical Services, Scarborough*   **September 2021- December 2021**

- Successfully managed and prioritized multiple projects including sample collections and preparation in accordance with SOP's, and conducted all required tests, extractions, and studies using HPLC-UV-vis.
- Provided support to senior team members in conducting method development and validation through participating in experimental work, preparing protocols, and processing and documenting data.
- Strengthened analytical skills such as weighing by difference with precision, micro pipetting, and data processing.

Research Assistant: *University of Waterloo, Waterloo*   **January 2021- April 2021**

- Developed and performed a series of experiments and assays, and studied DNA-based biosensors by conducting sample preparation and using Polyacrylamide gel electrophoresis to visualize results.
- Scientifically analyzed results using Image Lab Software and Excel to create plots and presentations to determine trends found in data; participated in scientific paper writing and the publication process.
- Maintained and managed lab equipment with a high degree of care and gained a strong understanding of laboratory procedures and safety protocols.

Teaching Experience

Teaching Assistant: *University of Waterloo*   **January 2024- April 2024**

Introductory Biochemistry Laboratory

- Providing students with guidance regarding the experiments in person

Teaching Assistant: *University of Waterloo*   **September 2023- December 2023**

Introduction to Scientific Calculations

- Graded weekly student assignments and provided insightful feedback.
- Provided students with assistance regarding course questions via email.

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Extra Curriculars

Waterloo iGEM (International Genetically Engineered Machine)   **January 2022- December 2022**

Lab and Design Team

- Collaborated in a multidisciplinary team to design and develop solutions to current world problems using the principles of synthetic biology.

Publications

D.L. Fehlings, M. Zarrei, W. Engchuan, N. Sondheimer, B. Thiruvahindrapuram, J.R. MacDonald, E.J. Higginbotham, R. Thapa, T. Behlim, S. Aimola, L. Switzer, P. Ng, J. Wei, P.S. Danthi, G. Pellecchia, S. Lamoureux, K. Ho, S.L. Pereira, J. de Rijke, W.W.L. Sung, A. Mowjoodi, J. Howe, T. Nalpathamkalam, R. Manshaei, S. Ghaffari, J. Whitney, R.V. Patel, O. Hamdan, R. Shaath, B. Trost, S. Knights, D. Samdup, A. McCormick, C. Hunt, A. Kirton, A. Kawamura, R. Mesterman, J.W. Gorter, N. Dlamini, D. Merico, M. Hilali, K. Hirschfeld, **K. Grover**, N.X. Bautista, K. Han, R.K.C. Yuen, P. Subbarao, M.B. Azad, S.E. Turvey, P. Mandhane, T. Moraes, E. Simons, G. Maxwell, M. Shevell, G. Costain, J.L. Michaud, D.J. Stavropoulos, R.F. Wintle, M. Oskoui, and S.W. Scherer. Comprehensive whole-genome sequence annotation to elucidate the genetic architecture of cerebral palsy. ***Nature Genetics***, 56, 585-594 (March 2024). https://doi.org/10.1038/s41588-024-01686-x

Presentations

Youth Tech Labs: Guest speaker   June 2024
"The unexpected hero in healthcare: AI"
- Presented to 50+ local high school

SickKids Summer Research Symposium   August 2023
"Predicting the pathogenicity and mechanism of missense variants on the GNAO1:RGS4 complex using AlphaFold2"
- Poster presentation

The Hospital for Sick Children   May 2023
"RNA-Seq Analysis on ZEB2"
- Presented to fellow lab members including PI

Cornell University   August 2022
"*Rubisco Activation Under Heat Treatment in Setaria"*
- Presented to fellow lab members including PI

Skills

Laboratory skills
- Record keeping
- Proficient in laboratory technical knowledge
- SDS-Page and gel electrophoresis
- Pipetting
- Sterilization
- (q)-PCR
- Western Blotting

Computational skills
- Python:
  Biopython, numpy, pandas, BioManager
- R:
  ggplot2, dplyr
- Linux, MIPS
- PIP, Docker, Anacondas
- Bioinformatics tools:
  AlphaFold2, SFARI database, Pymol2, Prodigy, REVEL, CADD, FoldX, ChimeraX