Jessica Shen

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EDUCATION

The University of British Columbia, B. Sc. (Hon) in Microbiology and Immunology

Sept 2017 – May 2022

- 3.90 GPA

The University of Toronto, Ph.D. In Molecular Genetics

Sept 2023 - Current

SCHOLARSHIPS AND AWARDS

- Science Undergraduate Research Experience (UBC) Award – May 2019
- Dean of Science Scholarship (UBC) – Sept 2020
- Faculty of Medicine Award in Multidisciplinary Research (UBC) – May 2022
- Canada Graduate Scholarships – Master's (U of T) – Sept 2024
- Michael Smith Foreign Study Supplements – (U of T) – Dec 2024
- Mitacs Globalink Research Award – (U of T) – Dec 2024

RESEARCH EXPERIENCE

Graduate Student – Master's | Babaian lab, Molecular Genetics (U of T)

Jan 2024 – Current

- Generated nucleic acid database validated with hidden Markov models (HMM) for petabase-scale papillomavirus discovery and developed novel quality control pipelines to ensure quality
- Used 50 petabytes of publicly available sequencing data to characterize over 100 novel papillomaviruses from different biological and ecological contexts, validated with alignment and HMM-based methods in Unix and R
- Gained experience working with large volumes of biological data, and familiarity with downstream processing software, including DIAMOND, HMMER, Alphafold, PyMOL

Laboratory Assistant | Tocheva lab, Microbiology and Immunology (UBC)

May 2022 – Sept 2023

- Designed and coordinated 96 and 384-well plate screens of *Mycobacterium abscessus* against a library of 683 small biologically active molecules with the Biofactorial High-Throughput Biology Facility (UBC)
- Collaborated with high-throughput facilities to carry out screens with high efficiency, generating over 2000 datapoints for investigation
- Processed and analyzed OD_{600} growth data with statistical methods in R and Unix command line
- Developed and conducted concentrations-response tests in collaboration for further validation of screen results

Directed Studies Student | Tocheva lab, Microbiology and Immunology (UBC)

Sept 2021 – May 2022

- Carried out independent research project in the Tocheva lab at UBC analyzing high-throughput OD_{600} data of nine Actinobacteria strains to investigate strain susceptibility to small molecules
- Utilized phase-contrast and fluorescence microscopy to observe bacterial cell morphology

Research Assistant (Co-op) | Nie lab, Agriculture and Agri-foods Canada

Jan 2020 – Aug 2020

- Performed phenol-chloroform RNA extractions, diagnostic RT-PCR, and agarose gel visualization testing for virus presence on over 400 potato sap samples
- Conducted literature reviews, compiled information, and drafted documents summarizing current and upcoming Potato Virus Y management strategies

Research Assistant (Science Undergraduate Research Experience Award) | Taylor lab, Zoology (UBC)

Feb 2019 – Feb 2021

- Extracted high-quality DNA samples from over 600 fish fin clips for distinguishing fish populations via SNP panel generation
- Conducted quality control, concentration normalization and library prep for 192 char samples prior to next-generation sequencing
- Processed and analyzed next-generation sequencing data to create a novel time-calibrated phylogeny tree for various char species using SNPs, utilizing programs such as BEAST2 and SNAPP

WORK EXPERIENCE

Teaching Assistant, Department of Ecology and Evolutionary Biology (U of T)

Sept 2023 – Apr 2024

- Teach weekly 2.5-3-hour lab sections for first- and second-year undergraduate students to learn practical wet laboratory and experimental skills, including microscopy, yeast plating, and pipette usage
- Marked written work and reports to assess student understanding of laboratory material
- Invigilated midterm and final exams according to course and university policies
- Received outstanding student reviews for all sections taught

Impact Assessment Officer, Impact Assessment Agency of Canada

Sept 2022 – Sept 2023

- Assisted in critically reviewing and analyzing documents submitted by project proponents to ensure correct interpretation, compliance, and implementation of the *Canadian Environment Assessment Act* (2012) or the *Impact Assessment Act* (2019) for metallurgical coal mine projects in southeast BC
- Organize and plan public information sessions with local communities and impacted Indigenous groups to receive public comment and carry out engagement

- Worked closely with provincial authorities and Indigenous groups to draft and finalize coordinated consultation plans

Project Assistant (Co-op), Impact Assessment Agency of Canada
January 2021 – August 2021

- Provided support on metallurgical coal mine projects by compiling information, recording meeting minutes and file organization on digital filing system
- Drafting guidance documents with regards to impact assessment policy implementation

RELEVANT COURSEWORK

MICB 447 (UBC)

- Processed microbiome data with the QIIME2 pipeline, and differential prediction of metagenome functional content with PiCRUST2

MICB 401 (UBC)

- Investigated impact of surface antigens on *E. coli* strains to Enterobacteria phage T2 infection, conducting stab, plaque, and adsorption assays, and PCR

BIOL 525D (UBC, Workshop)

- Graduate-level class exploring concepts of next generation sequencing (NGS), processing and analysis of data, and usage of Unix command line to streamline NGS data analysis strategies

ADDITIONAL EXPERIENCE

Mental Health Committee (Impact Assessment Agency of Canada)
Sept 2023

- Responsible for coordinating activities to support mental health within the workplace, such as coffee chats and group exercises

Panelist (Various, UBC)
Feb 2021, March 2022, Sept 2022

- Participated as a panelist to field undergraduate questions in the Multidisciplinary Undergraduate Research Conference, the Microbiology and Immunology Mentorship Night, and the Microbiology and Immunology Co-op Series.
- Answered student questions and provided advice related to undergraduate experience of research, effective presentation skills, conference communication methods, and Co-op experiences.

RELEVANT SKILLS

- Unix command line
- Data analysis using R
- Processing NGS data
- Microsoft Office suite
- Bash scripting
- Project management
- Aseptic technique
- Nucleic acid extraction
- PCR
- RT-PCR
- Bacterial culture
- DNA and RNA extraction
- Scientific writing
- Laboratory note-keeping
- Bacterial transformation
- Virus culturing
- Metagenome analysis
- Media preparation