

Fumiya Inaba

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RESEARCH EMPLOYMENT

Guillaud & MacAulay Lab, BC Cancer Research Center

Vancouver, BC, Canada

Graduate Research Student

May 2023 - Present

- Developed and optimized parts of an image analysis pipeline for multiple instance learning projects with hundreds of mega- and gigapixel scale images, such as nuclear segmentation and statistical analysis.
- Optimized and evaluated attention-based segmentation models for whole-slide images, reducing model size by over 80% without a statistically significant drop in performance.

MacAulay Lab, BC Cancer Research Centre

Vancouver, BC, Canada

Research Assistant (Co-op)

Sep 2022 – May 2023

- Fine-tuned in-house instance segmentation model, achieving a 15% improvement in performance.
- Optimized image data pipeline using TensorFlow, enabling more efficient VRAM utilization and scaling training data volume by more than 2.5x.

Guillaud Lab, BC Cancer Research Centre

Vancouver, BC, Canada

Research Assistant (Co-op)

Jul 2022 – Sep 2022

- Analyzed and classified over 10,000 individual nuclei across 400 images to enhance accuracy of deep learning segmentation model training.
- Utilized TensorFlow and CreateML to develop highly accurate deep learning image classification models distinguishing stroma vs epithelium in hematoxylin and eosin-stained tissue, achieving a 90% accuracy rate.

Hallam Lab, University of British Columbia (UBC)

Vancouver, BC, Canada

Research Assistant (Co-op)

Oct 2021 – Apr 2022

- Conducted comparative analysis of polyacrylamide gel electrophoresis (PAGE) gels between WT BL21 cells and transformed cells post-IPTG induction to confirm successful expression of NosZ genes in the plasmid.
- Cultivated and transformed BL21 E. coli cells with a plasmid vector encoding accessory proteins integral to the NosZ denitrification pathway.
- Validated designed plasmid constructs using restriction digests of transformed BL21 E.coli cells.

PROJECT EXPERIENCE

UBC Biomolecular Design (BIOMOD)

Vancouver, BC, Canada

Computational Design Team Leader

Oct 2019 – Oct 2021

- Pioneered the DNA origami nanostructure design pipelines utilizing software such as caDNA2, MrDNA to design custom structures for two research projects.
- Led the design of a DNA nanoscale hinge structure and an angle-locking mechanism using caDNA2 for potential applications in biomolecular diagnostics and nanorobotics.
- Managed and trained a team of 7 over three years, supervising the successful designs of multiple nanostructures across two research projects, one of which won first place in the [BIOMOD Japan Open competition](#) in 2022.

EDUCATION

University of British Columbia (UBC)

Vancouver, BC, Canada

Doctor of Philosophy – Interdisciplinary Oncology

(Expected) Graduation: May 2028

University of British Columbia (UBC)

Vancouver, BC, Canada

Bachelor's of Medical Laboratory Sciences

Graduation: May 2022

PUBLICATIONS

1. Law M, Susham C, Mackay D, et al. Self-Assembly of a Repeatable DNA Nanohinge System Supporting Higher Order Structure Formation. bioRxiv. Published online January 1, 2023:2023.05.26.542516. doi:10.1101/2023.05.26.542516

AWARDS

University of British Columbia (UBC) <i>President's Academic Excellence Initiative Award</i>	Vancouver, BC, Canada <i>Jan 2025</i>
Natural Sciences and Engineering Research Council of Canada (NSERC) <i>Canada Graduate Scholarship – Master's</i>	Vancouver, BC, Canada <i>May 2024</i>
Interdisciplinary Oncology Program, UBC <i>Interdisciplinary Oncology Program Research Excellence Award</i>	Vancouver, BC, Canada <i>Jan 2024</i>
University of British Columbia (UBC) <i>BPOC Graduate Excellence Award</i>	Vancouver, BC, Canada <i>Sep 2023</i>
Interdisciplinary Oncology Program, UBC <i>Faculty of Medicine Graduate Award</i>	Vancouver, BC, Canada <i>May 2023</i>

CONFERENCE PRESENTATIONS

B.I.G Research Day 2025 (BIG25) <u>Poster Presentation</u> – <i>Attention Enhanced Sequential U-Net for Nuclear Segmentation</i>	Vancouver, BC, Canada <i>Mar 2025</i>
Quantitative Bio-Imaging Society – Multiplex Image Analysis Workshop <u>Oral Presentation</u> – <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	San Diego, CA, USA <i>Sep 2024</i>
TCAIREM Trainee Rounds <u>Virtual Oral Presentation</u> - <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	Toronto, ON, Canada <i>Aug 2024</i>
Pathology Day 2024 <u>Poster Presentation</u> - <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	Vancouver, BC, Canada <i>Jun 2024</i>
B.I.G Research Day 2024 (BIG24) <u>Poster Presentation</u> - <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	Vancouver, BC, Canada <i>Mar 2024</i>
BC Cancer Summit 2023 <u>Oral Presentation</u> - <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	Vancouver, BC, Canada <i>Nov 2023</i>
Canadian Cancer Research Conference 2023 <u>Virtual Poster Presentation</u> - <i>Large-scale DNA Organization Predicts Aggressive Prostate Cancer in Low and Intermediate Risk Radical Prostatectomy Patients</i>	Halifax, NS, Canada <i>Nov 2023</i>

BIOMOD Japan Open 2022

Virtual Oral Presentation – The Nanohinge: Diagnosing the Problem of Complex Structure Design in Low Carbon Economy

Virtual, Japan*May 2022***PATH 438 Directed Studies Presentation Day**

Virtual Oral Presentation – Optimization of a Methylation-Specific qPCR Assay for Cell-Free Fetal DNA Quantification in Maternal Plasma

Vancouver, BC, Canada*Apr 2022*

AFFILIATIONS**BC Cancer Research Centre, PHSA***Graduate Student***Vancouver, BC, Canada***May 2023 - Present***UBC, Department of Pathology and Laboratory Medicine***Undergraduate/Graduate Student***Vancouver, BC, Canada***Sep 2020 - Present***UBC Data Science and Health (DASH) Cluster***Graduate Student/Trainee***Vancouver, BC, Canada***Sep 2023*