



EMILY HASHIMOTO-ROTH, M.SC.

PH.D. STUDENT

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 emilyhashimotoroth

EDUCATION

Ph.D. in Molecular Genetics (Computational Biology track) Sept 2022 – present
University of Toronto

M.Sc. in Biochemistry specializing in Bioinformatics Sept 2019 – Dec 2021
Defended December 1st, 2021
University of Ottawa

H.B.Sc. in Biopharmaceutical Science (Genomics option) Sept 2015 – Apr 2019
University of Ottawa

EXPERIENCE

Front-end Developer (part-time, remote) Jan 2024 – present
Faculty of Medicine, University of Ottawa

- Supervised by Dr. Steffany Bennett
- Create the graphical user interface for bioinformatics tools developed by members of the Neural Regeneration Laboratory.
- Update the Neural Regeneration Lab and CompLiMet (Computational Lipidomics and Metabolomics) websites.

Developer (part-time, remote) Sept 2022 – Dec 2023
Faculty of Medicine, University of Ottawa

- Supervised by Dr. Steffany Bennett
- Contribute to ongoing bioinformatics projects.
- Update the Neural Regeneration Lab and CompLiMet (Computational Lipidomics and Metabolomics) websites.

Junior Research Technician May 2022 – Aug 2022
Faculty of Medicine, University of Ottawa

- Supervised by Dr. Mathieu Lavallée-Adam and Dr. Steffany Bennett
- Implemented a command-line tool for human plasma protein-protein interaction confidence assessment.
- Developed the website for CompLiMet, a suite of omics data analysis tools.
 - Website: <https://www.complimet.ca>

- Developed (ongoing) the website for LipidManifold, a lipid annotation and mass spectrometry fragmentation database.
 - Website: in development.

Graduate Student Research Assistant (part-time internship)

Feb 2021 – Dec 2021

National Research Council of Canada

- Supervised by Dr. Miroslava Čuperlović-Culf
- Created META-BOA, a tool for addressing class imbalance in lipidomics and metabolomics datasets using over-sampling algorithms.

Graduate Student Research Assistant

Sept 2019 – Dec 2021

Faculty of Medicine, University of Ottawa

- Supervised by Dr. Mathieu Lavallée-Adam and Dr. Steffany Bennett
- Created MAGPIE, a machine learning algorithm for the confidence assessment of protein-protein interactions in human plasma.
- Contributed to the research project and publication investigating putatively targeted human protein sequence motifs by the SARS-CoV-2 virus.

Junior Researcher

May 2018 – Aug 2019

Employment and Social Development Canada

- Designed new and improved existing applications on both internal and external website platforms, used by government agents and the Canadian population, respectfully.
- Configured and optimized how data is captured within the website (e.g., mapping where meta-data is captured on the website).

Honours Project Research Student

Sept 2018 – Apr 2019

Lavallée-Adam Lab, Faculty of Medicine, University of Ottawa

- Supervised by Dr. Mathieu Lavallée-Adam
- Produced thesis titled, “A machine learning approach to deciphering protein-protein interactions in human plasma”

Pharmacy Assistant

Apr 2017 – Dec 2018

Rexall Ltd.

- Maintained accurate patient prescription records.
- Filled prescriptions (e.g., counting pills, compounding).

Junior Accident Analyst

May 2017 – Aug 2017

Transport Canada

- Collected and analyzed large datasets.
- Maintained database and data collection integrity.

PUBLICATIONS

PEER-REVIEWED PUBLICATIONS

* First author, co-first author

- [3] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., & Lavallée-Adam, M. (2024) MAGPIE: A machine learning approach to decipher protein-protein interactions in human plasma. *Journal of Proteome Research*. Accepted October 30, 2024.
- [2] **Hashimoto-Roth, E.***, Surendra, A., Lavallée-Adam, M., Bennett, S. A. L., & Čuperlović-Culf, M. (2022) METAbolomics data Balancing with Over-sampling Algorithms (META-BOA): an online resource for addressing class imbalance. *Bioinformatics*, 38(23), 5326–5327. <https://doi.org/10.1093/bioinformatics/btac649>
- [1] Nadeau, R.* , Shahryari Fard, S.* , Scheer, A.* , **Hashimoto-Roth, E.***, Nygard, D.* , Abramchuk, I.* , Chung, Y. E.* , Bennett, S. A. L., & Lavallée-Adam, M. (2020). Computational Identification of Human Biological Processes and Protein Sequence Motifs Putatively Targeted by SARS-CoV-2 Proteins Using Protein-Protein Interaction Networks. *Journal of Proteome Research*, 19(11), 4553–4566. <https://doi.org/10.1021/acs.jproteome.0c00422>

IN PREPARATION & UNDER REVIEW

* First author, co-first author

- [2] Ou, H.* , Surendra, A.* , McDowell, G. S. V., **Hashimoto-Roth, E.**, Xia, J., Bennett, S. A. L., & Čuperlović-Culf, M. (2024) Imputation for Lipidomics and Metabolomics (ImpLiMet): Online optimization and method selection for missing data imputation. *Under review*.
- [1] Ng, T.* , **Hashimoto-Roth, E.**, Röst, H., & Wheeler, M. (2024) Plasma biomarkers used for the early prediction of gestational diabetes mellitus. *Under review*.

SCHOLARSHIP

Banting & Best Diabetes Centre – Novo Nordisk Graduate Student Award Amount: CAD\$25,000/year <i>Accepted \$480 as a top up to the CIHR award below.</i>	2024 – 2025
Canadian Institutes of Health Research (CIHR) Doctoral Research Award Amount: CAD\$120,000/3 years	2024 – 2027
Ontario Graduate Scholarship Amount: CAD\$15,000/year	2023 – 2024
NSERC-CREATE Metabolomics Advanced Training and International Exchange (MATRIX) Scholarship Amount: CAD\$40,000/2 years	2019 – 2021

NSERC-CREATE MATRIX Metabolomics Research Training Scholarship November 2020
Amount: CAD\$240
(To attend the American Society for Mass Spectrometry's virtual 2020 workshop: R Fundamentals and Best Practices for Mass Spectrometry Data Analysis)

Neural Regeneration Laboratory Scholarship 2021
Amount: CAD\$2,000/year
(To act in a communications role, creating a new Neural Regeneration Laboratory website)

HONOURS AND AWARDS

CNPN-HUPO Trainee Travel Award June 2023
Canadian National Proteomics Network

- To attend and present at the HUPO 2023 World Congress.
- Amount: Cost of registration + CAD\$500

Winner of Trainee Pre-Symposium Best Talks May 2022
Canadian National Proteomics Network 13th Annual Symposium

- One of two talks (out of 18) chosen to present at the main symposium.

Best Thesis Award Nomination December 2021
Faculty of Medicine, University of Ottawa

- Nominated by M.Sc. thesis defence evaluators.

Commission on Graduate Studies in Sciences Prize Nomination December 2021
University of Ottawa

- Nominated by M.Sc. thesis defence evaluators.

Graduate Student Poster Competition Finalist (online) November 2021
HUPO ReCONNECT 2021 World Congress

- One of eight finalists selected from 60 applicants.

Department Seminar Day Winner (online) April 2021
Faculty of Medicine, University of Ottawa

- Ranked 1st place among all participating students in my program.
- Evaluations conducted by professors and fellow students.
- Amount: CAD\$100

Student Travel Award March 2020
American Society for Mass Spectrometry

- To attend and present at the 2020 American Society for Mass Spectrometry 68th Annual Conference.
- Amount: USD\$200

Cancelled following the move to an online platform during the COVID-19 pandemic.

- To attend and present at the 2019 Canadian National Proteomics Network 11th Annual Symposium.
- Amount: CAD\$430

CONFERENCE ABSTRACT

ORAL PRESENTATION

* Presenting author

- [10] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M-S., Coulombe, B., Lavallée-Adam, M. (2023) MAGPIE: Using machine learning to assess the confidence of protein-protein interactions in human plasma. Human Proteome Organization World Congress 2023 (HUPO 2023), Busan, South Korea.
- [9] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M-S., Coulombe, B., Lavallée-Adam, M. (2022) MAGPIE: Using machine learning to assess the confidence of protein-protein interactions in human plasma. 2022 Department of Biochemistry, Microbiology and Immunology Scientific Symposium, Montebello, QC, Canada.
- [8] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M-S., Coulombe, B., Lavallée-Adam, M. (2022) MAGPIE: Using machine learning to assess the confidence of protein-protein interactions in human plasma. 2022 Ottawa Institute for Systems Biology Symposium (OISB 2022), Cornwall, ON, Canada.
- [7] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M-S., Coulombe, B., Lavallée-Adam, M. (2022) MAGPIE: Using machine learning to assess the confidence of protein-protein interactions in human plasma. Trainee Pre-Symposium, Canadian National Proteomics Network 13th Annual Symposium (CNPN 2022), Montreal, QC, Canada.
Selected as one of two trainees (out of 18) to present at the main symposium by a panel of judges.
- [6] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M-S., Coulombe, B., Lavallée-Adam, M. (2021) MAGPIE: A machine learning approach to decipher protein-protein interactions in human plasma. Human Proteome Organization World Congress ReCONNECT 2021 (HUPO ReCONNECT 2021), online.
- [5] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2021) MAGPIE: A machine learning approach to decipher protein-protein interactions in human plasma. University of Ottawa's Department of Biochemistry, Microbiology and Immunology Seminar Day, online.
Selected as 1st place prize winner for best presentation by an M.Sc. student.

- [4] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2021) MAGPIE: A machine learning approach to decipher protein-protein interactions in human plasma. Main Symposium, Canadian National Proteomics Network Annual Symposium (CNPN 2021), online. **Invited talk.**
- [3] Patel, A.*, Suk, T., Callaghan, S., **Hashimoto-Roth, E.**, Lavallée-Adam, M., Ngsee, J., Rousseaux, M. (2020) Mapping the ALS linked interactome. Brain and Mind Institute's Brain Health Research Week, online.
- [2] Scheer, A.*, Nadeau, R., Nygard, D., **Hashimoto-Roth, E.**, Shahryari-Fard, S., Abramchuk, I., Chung, Y.-E., Lavallée-Adam, M. (2020) Identification of human biological processes and protein sequence motifs putatively targeted by SARS-CoV-2 proteins. Intelligent Systems for Molecular Biology 28th Conference (ISMB 2020 COVID-19), online.
- [1] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Coulombe, B., Gauthier, M.-S., Lavallée-Adam, M. (2019) A machine learning approach to decipher protein-protein interactions in human plasma. Trainee Pre-Symposium, Canadian National Proteomics Network 11th Annual Symposium (CNPN 2019), Quebec City, QC, Canada.

POSTER PRESENTATION

* Presenting author

- [9] **Hashimoto-Roth, E***, Van, J. A. D., Gunderson, E. P., Wheeler, M. B., & Röst, H. L. (2024) Identifying biomarkers of gestational diabetes mellitus and type II diabetes for machine learning-based disease prediction and deeper characterization of insulin resistance metabolism. 2024 Department of Molecular Genetics Retreat, Niagara-on-the-Lake, ON, Canada.
- [8] **Hashimoto-Roth, E.***, Čuperlović-Culf, M., Bennett, S. A. L. (2023) Constellation Network Maps: An innovative R package for mapping Lipid Network Disruptions in dementia with Lewy Bodies applicable to all dementias. International Conference on Alzheimer's and Parkinson's Diseases and related neurological disorders (AD/PD 2023). Gothenburg, Sweden.
- [7] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2022) MAGPIE: Using machine learning to assess the confidence of protein-protein interactions in human plasma. Trainee Pre-Symposium, Canadian National Proteomics Network 13th Annual Symposium (CNPN 2022), Montreal, QC, Canada.
- [6] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2021) MAGPIE: A machine learning approach for deciphering protein-protein interactions in human plasma. Human Proteome Organization World Congress ReCONNECT 2021 (HUPO ReCONNECT 2021), online.
Selected as finalist in graduate student poster competition.

- [5] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S. A. L., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2021) MAGPIE: A machine learning approach to decipher protein-protein interactions in human plasma. American Society for Mass Spectrometry's 69th Annual Conference (ASMS 2021), online.
- [4] Patel, A.*, Suk, T., Callaghan, S., **Hashimoto-Roth, E.**, Lavallée-Adam, M., Ngsee, J., Rousseaux, M. (2020) Using a proteomic approach to map the interactome of TDP-43 in the content of ALS. 31st International Symposium on ALS/MND, online.
- [3] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2020) A machine learning approach for deciphering protein-protein interactions in human plasma. Intelligent Systems for Molecular Biology 28th Conference (ISMB 2020), online.
- [2] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Bennett, S., Gauthier, M.-S., Coulombe, B., Lavallée-Adam, M. (2020) A machine learning approach for deciphering protein-protein interactions in human plasma. American Society for Mass Spectrometry 68th Annual Conference Reboot (ASMS 2020 Reboot), online.
- [1] **Hashimoto-Roth, E.***, Forget, D., Gaspar, V., Coulombe, B., Gauthier, M.-S., Lavallée-Adam, M. (2019) A machine learning approach to decipher protein-protein interactions in human plasma. Canadian National Proteomics Network 11th Annual Symposium (CNPN 2019), Quebec City, QC, Canada.

SCHOLARLY AND PROFESSIONAL ACTIVITY

Co-Founder and Communications Director

November 2023 – present

Toronto Bioinformatics Hackathon

- Contribute to drafting the inaugural event proposal.
- Design organization's logo and brand identity.
- Create and maintain the organization's website.
- Act as a point of contact for prospective sponsors and partners.
- Coordinate sponsorship outreach strategy with Outreach Executive.
- Coordinate social media activity with Media Executive.

Marketing and Outreach Committee (MOC) Member

Jan 2021 – present

Human Proteome Organization (HUPO)

Co-Chair

Feb 2024 – present

- Support MOC Chair in leading committee activities and meetings.
- Supervise working groups through fulfilling their goals.
- Attend Executive Committee meetings and liaise updates to MOC.

Chair of Branding Working Group

Jun 2023 – present

- Lead the efforts to maintain the organization's brand identity.
- Create and maintain the HUPO Brand Guide.
- Maintain the HUPO Social Media and Webinar Guides.
- Contribute to the Social Media Working Group.

Early Career Researcher (ECR) Committee Representative Jan 2021 – Jun 2023

- Liaise between the ECR and MOC.
- Create the HUPO Social Media and Webinar Guides.
- Create volunteer opportunities for trainees and early career researchers.
- Develop initiatives to highlight members of the global proteomics research community.
- Design and procure merchandise for *Humans of HUPO* initiative.

Early Career Researcher (ECR) Committee Member Nov 2020 – present
Human Proteome Organization (HUPO)

Vice-Chair of Logistics Oct 2024 – present

- Elected by members of the ECR Committee.
- Oversee all World Congress activities, awards, and competitions.
- Ensure that members responsible for World Congress activities, awards, and competitions are on schedule.
- Manage any new World Congress activities.
- Report on World Congress activities to ECR Committee.

General Member Nov 2020 – Oct 2024

- Create promotional content for events and monthly newsletters.
- Advertise ECR Initiative activities across social media accounts.
- Contribute to the organization of a monthly seminar series.
- Contribute to the organization of ECR activities at the annual World Congress.
- Organized a design competition for a new ECR logo.

Operations Management Team Member Nov 2020 – present
Canadian National Proteomics Network (CNPN)

Content Lead Sept 2022 – present

- Design and create content for email campaigns, social media, and website.
- Provide media support for the annual symposium.

Website Lead Nov 2020 – Sept 2022

- Lead and execute the organization's rebranding and website redesign/build.
- Optimize integration of mailing lists with the website.
- Aid in the development of a new monthly seminar series.
- Provide support for the annual symposium.

Early Career Research Poster Competition Abstract Evaluator July 2024
Human Proteome Organization 23rd World Congress (HUPO 2024)

3-Minute Thesis Competition Abstract Evaluator June 2024
Human Proteome Organization 23rd World Congress (HUPO 2024)

Graduate Student 3-Minute Thesis Competition Judge May 2024
Spotlight Series Webinar, Canadian National Proteomics Network

HUPO 2023 AI Tools in Writing Co-Chair September 2023
Early Career Researcher Committee Mentoring Session, HUPO
Previously called Early Career Researcher Initiative

Abstract Evaluator for Trainee Pre-Symposium Canadian National Proteomics Network 14 th Annual Symposium (CNPN 2023)	April 2023
Poster Evaluator Ottawa Institute for Systems Biology Symposium (OISB 2022)	May 2022
Annual Symposium Session Co-Chair Canadian National Proteomics Network 13 th Annual Symposium (CNPN 2022)	May 2022
Abstract Reviewer for Trainee Pre-Symposium Canadian National Proteomics Network 13 th Annual Symposium (CNPN 2022)	April 2022
Director of Communications Executive Team, Pulsar Collective	Oct 2018 – Dec 2021
<ul style="list-style-type: none"> • Act as a founding member of the organization. • Act as the team lead for marketing and communications team. • Build and maintain the organization's website and mailing lists. 	
HUPO ReCONNECT 2021 Proteomics 101 Video Invited Speaker (online) Early Career Researcher Initiative Proteomics 101 Session, HUPO	November 2021
HUPO ReCONNECT 2021 Scientific Integrity Co-Chair (online) Early Career Researcher Initiative Mentoring Session, HUPO	November 2021
Spotlight Series Seminar Chair (online) Canadian National Proteomics Network <i>Previously called CanProteoTalks</i>	October 2021
Promoting Diversity in Proteomics Chair (online) Early Career Researcher Committee Panel Series, HUPO	May 2021
Conference Moderator (online) IgNITE Medical Case Competition	February 2021
Team Mentor IgNITE Medical Case Competition	Oct 2020 – Feb 2021
<ul style="list-style-type: none"> • Provided guidance for creating impactful scientific abstracts, posters, and oral presentations. • Mentored three teams of high school and undergraduate students participating in the competition. • Continued mentoring one team that successfully made it to the final competition round. 	
Critically Appraising Research Workshop Co-host (online) IgNITE Medical Case Competition	November 2020
Biopharmaceutical Science Program Representative University of Ottawa Open House	March 2019

Guest Speaker

January 2019

Biopharmaceutical Science Information Night, Science Students' Association

Lavallée-Adam Laboratory Representative

November 2018

Networking Event for 2019 – 2020 Undergraduate Honours Projects, University of Ottawa

COMMUNITY INVOLVEMENT

Banner and Flyer Designer

May 2024

Human Proteome Organization (HUPO)

- Designed a large banner and flyer for advertising the 23rd HUPO World Congress at the 22nd Japanese Proteomics Society Annual Conference.

First Year Mentor

Sept 2023 – May 2024

Molecular Genetics Graduate Student Association (MoGen GSA)

- Act as a dedicated point of contact for four first-year graduate students, supporting them through their first year of the Molecular Genetics M.Sc. and direct entry Ph.D. programs.
- Attend and help facilitate orientation events for first-year graduate students.

Graphic Designer

Feb 2023 – Feb 2024

Molecular Genetics Graduate Student Association (MoGen GSA)

- Design and create content for advertising MoGen GSA activities.

Conference Poster Designer and Creator

Sept 2022 – May 2023

CSMB 2023 Conference, Canadian Society for Molecular Biosciences (CSMB)

- Collaborate with planning committee members.
- Design and create the poster used to advertise the conference, and programme cover.

Email Ambassador

March 2023

Molecular Genetics Graduate Student Association (MoGen GSA)

- Reached out to assigned prospective M.Sc. and direct entry Ph.D. Molecular Genetics students (i.e., students with offers of acceptance for Fall 2023 entry).
- Acted as a dedicated point of contact to answer questions pertaining, but not limited, to the program, graduate student life, and living in Toronto.

Photographer

May 2022

Discovery Day 2022, Faculty of Medicine, University of Ottawa

- Attended both English and French Discovery Day sessions.
- Took and edited photos, capturing moments throughout the event.

Grade 12 Biology Guest Speaker (virtual)

May 2022

The Hill Academy, Caledon, Ontario

- Gave grade 12 students an overview of the bioinformatics field.
- Answered questions regarding navigating post-secondary education in STEM, seeking research opportunities, and the job market.

Leadership Program Staff Member

Sept 2019 – Sept 2021

Ridgemont High School (RHS), Ottawa Carleton District School Board

- Act as a fully vetted Ottawa Network for Education (ONFE) volunteer.
- Carry out supporting roles during the preparation and execution of the RHS bi-annual leadership camp.

Vice-President (VP) of Social Media

Oct 2020 – Apr 2021

Biochemistry, Microbiology and Immunology Graduate Student Association (BMIGSA)

- Act as the BMIGSA's first VP of Social Media.
- Manage the BMIGSA social media channels.
- Create and organize content.

Conference Poster Designer and Creator

Feb 2020 – Mar 2020

CSMB 2020 Conference, Canadian Society for Molecular Biosciences (CSMB)

- Collaborated with planning committee members.
- Designed and created the poster used to advertise the conference.

*Cancelled to preserve the efforts combatting the COVID-19 pandemic.***Social Media Coordinator**

Aug 2017 – Apr 2018

Science Students' Association, University of Ottawa

- Act as the association's first Social Media Coordinator.
- Work with the association's Vice President of Promotional Affairs.
- Increased the association's online presence and student engagement.

101 Week Head Guide

Jul 2017 – Sept 2017

Science Students' Association, University of Ottawa

- Led and ensured the safety of a group of incoming first-year science undergraduates through a week of events.
- Provided safe, accompanied walks home for students living in the downtown Ottawa area.

Departmental Representative

Oct 2016 – Apr 2017

Science Students' Association, University of Ottawa

- Acted as a voice for the Biopharmaceutical Sciences students at council meetings.
- Organized and ran academic and social events.gm

OTHER AWARDS

Logo Competition Winner

Centre for Infection, Immunity and Inflammation, University of Ottawa

December 2020

- Amount: CAD\$250

Illustration Contest 2nd Place Winner

February 2019

Department of Biochemistry, Microbiology and Immunology, University of Ottawa

- Amount: CAD\$100

SKILLS

COMPUTER SKILLS

- Programming with R and Python.
- Creating responsive websites with HTML, CSS, Bootstrap, and React.
- Using SLURM for task management on high-performance computing clusters.
- Proficient with Microsoft Office, Adobe Photoshop, Lightroom, Illustrator, InDesign, and Dreamweaver.

PHOTOGRAPHY

- Canon EOS 90D DSLR