DR. AMBER R. PAULSON

E-mail: Amber.Rose.Paulson@gmail.com
Website: https://damselflywingz.github.io/
GitHub: https://github.com/damselflywingz
Scholar Google: https://scholar.google.com/citations?user=sxleRyYAAAAJ&hl=en
Citizenship: Canadian

ACADEMIC APPOINTMENTS

2023 – present Postdoctoral researcher, Joy Lab – BC Centre for Excellence HIV/AIDS, University of British Columbia Faculty of Medicine

ACADEMIC DEGREES

2020 Massey University, Ph.D., Genetics

- Thesis: "Temperature- and host-dependent regulation of virulence factors in an insect pathogenic bacterium, *Yersinia entomophaga.*"

2014 University of Victoria, M.Sc., Biological Sciences

- Thesis: "The microbial associates and putative venoms of seed chalcid wasps (Hymenoptera: Torymidae: *Megastimgus*)."

2007 Vancouver Island University, B.Sc. (Honours), Biological Sciences

- Graduated with distinction.

AWARDS

2023-2025 Michael Smith Labs BC Health Research Training Fellowship Award

2016-2019: Commonwealth Scholarship and Fellowship Plan

2015 *declined* -Alexander Graham Bell Canada Graduate Scholarships – Doctoral Program

2015-2018 NSERC Post Graduate Scholarship – Doctoral

2018 New Zealand Society for Microbiology – Student Travel Grant

2017 New Zealand Society for Microbiology – Best Student Talk

2012 University of Victoria – M.C. Melburn Award

2011 University of Victoria – Amelia Leith Memorial Fellowship

2007 NSERC Undergraduate Research Award

PROFESSIONAL EXPERIENCE

2013 – 2015 & 2020 – present BC Ministry of Environment and Climate Strategy – Environmental Assessment Office, Project Assessment Officer – Indigenous Nation engagement

2020 – 2021 Post doctoral Researcher, Colautti Lab, Queen's University (Kingston Ontario)

2011 Fisheries and Oceans Canada, Aquaculture Resource Management Branch, Aquaculture Management Coordinator/ Indigenous Relations.

2007 – 2011 McNaughton Environmental Consultants Ltd., Environmental Monitor/Fisheries Consultant.

2005; 2006 Mount Arrowsmith Biosphere Foundation, Co-op summer student.

TEACHING, MENTORING AND OUTREACH

2024	The RNA Revolution: From dark matter to major therapeutic breakthroughs. BC-Centre for Excellence HIV/AID Learning Series Webinar, accredited by the College of Family Physicians of Canada and the British Columbia Chapter (up to 1 Mainpro+ credit). Cullen Family Lecture Theatre, St. Paul's Hospital
2022	Edge of Lyme hack-a-thon – Presented - Exploring the inner world of important Lyme disease vector *Ixodes scapularis*.
2020 – present	Queen's University – coordinate regular writing focus/ check-ins for graduate students and post-doctoral researchers to support a collegial remote work environment.
2021	Queen's Bioinformatics Advanced R Workshop – Bioinformatics approaches for data analysis of short-read sequence data.
2020	Canadian Lyme Disease Research Network – Trainee Series Webinar – Tools for Bioinformatics Short-Read Sequence Data Processing
2020	Hackseq RNA: COVID-19 Ultra-hackathon – Project Leader – Modelling potential miRNA interactions in SARS-CoV-2; https://youtu.be/pxTEwiW6TJU *Second place overall, awarded for top participant satisfaction
2012 – 2013	Laboratory Instructor – Biology 190A/Biology 190B Biology Department, University of Victoria
2013 – 2015	Coordinator – Canadian Association for Girls in Science, Victoria BC Chapter
2006	Teaching Undergraduate Biology (Biology 492 - Entomology) Biology Department, Vancouver Island University

INVITED TALKS AND CONFERENCE PRESENTATIONS

31st International Dynamics & Evolution of Human Viruses – June 2024, Squamish, BC, Canada\

- Talk: Small viral RNA evolution and the origin of SARS-CoV-2: Insights from functional genomics.

BC CDC Tick-borne and Climate Change - 3 West quarterly check-in – August 2022, virtual.

- invited talk: Multi-omics analysis identifies symbionts and pathogens of blacklegged ticks (Ixodes scapularis) from a Lyme disease hotspot in southeastern Ontario, Canada.

Canadian Lyme Disease Research Network annual general meeting– 2020, virtual.

- Invited symposium talk: Unbiased metagenomic analysis of *Ixodes scapularis* microbiomes in the Kingston Frontenac region.

Agriculture and Agri-Food Canada – 2020, Agassiz, BC.

- Invited seminar lecture: from venoms to virulence factors, transcriptomics provides insights into challenging systems.

Entomological Society of America – 2017, Denver, Colorado

- Invited symposium talk: From venoms to virulence factors – Revealing ecological and evolutionary insights with RNA-seq.

New Zealand Microbiological Society Conference – 2018, Dunedin, New Zealand

- Talk: Exploring the potential role of cold-shock proteins as regulators of virulence in the insect pathogenic bacteria, *Yersinia entomophaga*.

Australian Society for Microbiology Conference – 2018, Brisbane, Australia

- Talk: The *in vivo* transcriptome of the insect pathogen, *Yersinia entomophaga*.

American Society for Microbiology Conference – 2018, Atlanta, Georgia

- Poster: The *in vivo* transcriptome of the insect pathogen, *Yersinia entomophaga*.

New Zealand Microbiological Society Conference – 2017, Auckland, New Zealand

- Talk: The *in vivo* transcriptome of the insect pathogen, *Yersinia entomophaga*.

New Zealand Microbiological Society Conference – 2016, Christchurch, New Zealand

- Talk: *In vivo* RNAseq – in a pinch.

PUBLICATIONS

Paulson, A.R., Montoya, V. & Joy, J.B. (In prep). Nuclear-acting small viral RNAs target enhancer sequence in human lung via heterotriplex formation in SARS-CoV-2

Paulson, A.R., M. Schoof, N. Naren, M. O'Callaghan, X.-X. Zhang, and M.R.H. Hurst. (in prep). Dual influence of *Yersinia entomophaga* on gene expression and virulence in *Galleria mellonella* via LytTR-type transcription factor (Yen6) and 645-bp non-coding RNA regulating secondary Yen-Tc promoter (Yen7).

Afsharnezhad, S., **Paulson, A.R.,** Sun, Z., Bourne, D., and Colautti, R.I. (in prep). Targeted suppression of *Rickettsia* 16S rRNA amplicons improves representation of pathogenic and rare bacteria in the *Ixodes scapularis* microbiome.

Schoof, M., O'Callaghan, M., Hefer, C., Glare, T. R., **Paulson, A. R.,** & Hurst, M. R. (2023). Lysis cassette-mediated exoprotein release in Yersinia entomophaga is controlled by a PhoB-like regulator. Micro. Spectrum, 11(2), e00364-23.

Paulson, A. R., Lougheed, S. C., Huang, D., & Colautti, R. I.(2023). Multiomics reveals symbionts, pathogens, and tissue-specific microbiome of blacklegged ticks (*Ixodes scapularis*) from a Lyme disease hot spot in southeastern Ontario, Canada. Microbiology Spectrum, 11(3), e01404-23.

Paulson, A.R., M. O'Callaghan, X.-X. Zhang, P.B. Rainey and M.R.H. Hurst. 2020. In vivo transcriptome analysis provides insights into host-dependent expression of virulence factors by Yersinia entomophaga MH96, during infection of Galleria mellonella. G3: Genes, Genomes, Genetics: 11(1) 1-12.

Paulson, A.R., J. Ehlting, P. von Aderkas and S.J. Perlman. 2020. Whole-body transcriptome of seed-parasitic wasp, Megastigmus spermotrophus, reveals ecological and evolutionary insights, in Shelomi, M. (ed.) Transcriptomics in Entomological Research. CAB International, pp. 113-135.

Paulson, A.R., C. Le, J. Dickson, J. Ehlting, P. von Aderkas and S.J. Perlman. 2016. Transcriptome analysis provides insight into venom evolution in a seed-parasitic wasp, Megastigmus spermotrophus. Insect Molecular Biology: 25(5) 604-616.

Paulson, A.R., P. von Aderkas and S.J. Perlman. 2014. Bacterial Associates of Seed-Parasitic Wasps (Torymidae: Megastigmus). BMC Microbiology 14.1: 224.

Epelbaum, A., T.W. Therriault, **A.R. Paulson** and C.M. Pearce. 2009. Botryllid tunicates: Culture techniques and experimental procedures. Aquatic Invasions. 4(1): 111-120.

Epelbaum, A., C.M. Pearce, D.J. Barker, **A.R. Paulson** and T.W. Therriault. 2009. Susceptibility of four non-indigenous Ascidian species in British Columbia (Canada) to invertebrate predation. Marine Biology. 156(6): 1311-1320.

PEER REVIEWER

- Insect Science, BMC Genomics, Environmental Entomology, Molecular Ecology, and Tick & Tick-borne Diseases.

PROFESSIONAL MEMBERSHIPS

- Canadian Society of Microbiologists
- The RNA Society
- BC General Employees' Union member

EXPERTISE

- *In vivo* transcriptomics for infection and immunity research;
- Arthropod microbiome, meta-transcriptome, RNA viruses, endosymbionts, *Yersinia*, and *Galleria mellonella*;
- R, Unix Shell, high-performance cluster computing;
- RNA biology, small viral RNA, RNA-RNA & RNA-DNA cross-kingdom signalling;
- Short-read sequencing (16S, RNA-seq, small RNA-seq), experimental design, molecular microbiology, molecular ecology;
- Engagement and consultation with Indigenous Nations and Treaty Partners on the review of major infrastructure and oil and gas projects.