Cole **Baril**

Laboratory Technician at JC Wilt Infectious Diseases Research Centre - Public Health Agency of Canada

Winnipeg, Manitoba, Canada

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Profile

- Planned, organized, designed, managed, and evaluated all stages of scientific projects as a researcher on neglected mosquito-borne pathogen research in Manitoba, including working independently and coordinating scientific teams.
- Identified the presence of mosquito-borne bunyaviruses in mosquitoes in Manitoba.
- Identified 33 viruses and >60 parasites and fungi harboured by mosquitoes in Manitoba.
- Presented my research to local (Winnipeg Insect Control Branch), Provincial (Manitoba Health) and Federal (Public Health Agency of Canada) governments.

Education

Master of Science

Brandon, Manitoba

Brandon University — *2022*

- Thesis: Insights into the Population Dynamics and Microbiome of Mosquitoes in Manitoba
- Supervisor: Dr. Bryan Cassone

Bachelor of Science

Winnipeg, Manitoba

The University of Winnipeg — *2019*

- Distinctions: Dean's Honour List

Experience

Laboratory Technician

Winnipeg, Manitoba

JC Wilt Infectious Diseases Research Centre - Public Health Agency of Canada — *2022-Present*

- Inspects user submitted sample results for quality and correctness; marks results in need of corrective action.
- Peforms quality assurance testing on HIV samples using GeneXpert and m-PIMA Analyser technology.
- Assists in sample shipment.

Graduate Researcher

Brandon, Manitoba

Brandon University, Biology Department — *2020-2022*

- Planned, organized, and managed all facets of several research projects related to mosquito surveillance, including leading a team of research assistants.
- Coordinated mosquito-borne bunyavirus surveillance by RT-PCR.
- Analyzed RNA Sequencing data to characterize the mosquito microbiome of mosquitoes in Manitoba.
- Procured mosquito trapping and weather data for statistical analysis.
- Managed inventory control for laboratory supplies and prepare purchase requisitions.
- Utilized strong project management skills in independently planning, organizing, designing, and delivering scientific (biology) projects within Brandon University.
- Employed sound operational decision-making skills for strategic planning, materials, equipment, analysis techniques, software usage and all aspects of the project.
- Administered project operating budgets, including diligently controlling labour and research procurement costs to meet fiscal and project goals with limited resources.
- Prepared weekly, monthly and annual reports on mosquito surveillance findings for 2020 and 2021 and shared data with the Manitoba's West Nile Surveillance Program, Manitoba Health (Manitoba Government) and the Public Health Agency of Canada (Canadian Government).
- Established connections with a network of other scientists throughout North America to discuss their research and request information to enhance lab surveillance projects by learning best practices.

Contract Bioinformatician

Brandon, Manitoba

Brandon University, Biology Department — *2021*

- Informed future grant application decisions by heading a pilot tick NGS bioinformatics project.
- Created a bioinformatics workflow to analyze tick NGS data.
- Identified what microbes were present in tick NGS data.
- Trained a staff member one-on-one on bioinformatics principles and molecular biology techniques.

Research Assistant

Winnipeg, Manitoba

Cibus, Product Development (Contract)

2022

- Created, edited and reviewed fieldbooks for field observation collection using Excel.
- Authored a report detailing the relationships between weather variables and Sclerotinia infection of canola plants.
- Made educated reccomendations for future research site selection.
- Visited experimental canola plots to observe plant quality, infestations, weed status and presence of disease.
- Compiled photos and reports of field visits into Microsoft OneNote files for each site.

Greenhouse Assistant

Winnipeg, Manitoba

DL Seeds, Breeding Program

2020

- Assisted in canola breeding programs by cross-pollinating plants in compliance with the supervisor's instructions and caring for healthy plants and those infected with pathogens (e.g., Sclerotinia and clubroot) in high-tech greenhouses and growth rooms.
- Prepared plant samples for marker testing for agricultural studies.
- Seeded, transplanted, and harvested canola plants.
- Logged experiment data in Excel.

Teaching

Sessional Instructor (Diseases 15:366)

Brandon, Manitoba

Brandon University, Biology Department

2022

- Prepared laboratory materials, media, and organisms.
- Created relevant quizzes and tests. Grade quizzes, tests, and assignments.
- Researched, designed, and delivered pre-lab presentations.
- Supported, tutored, and guided students during lab sessions.

Teaching Assistant (Biodiversity, Functions and Interactions 15:163)

Brandon, Manitoba

Brandon University, Biology Department

2021

- Prepared and delivered pre-lab briefings in two lab sections prior to student experiments to explain concepts and procedures using the Zoom virtual platform.
- Assisted students using MacMillan Learning Software during lab procedures and responded to questions.
- Graded assignments and tests. Provided written and oral critiques to improve student performance.
- Assisted the professor in test creation.

Publications

1. **Cole Baril**; Christophe MR. LeMoine; Bryan Cassone. Black queen cell virus detected in Canadian mosquitoes. *Archives of Virology*. Status: Finalizing manuscript.
2. **Cole Baril**, Ben G. Pilling , Milah J. Mikkelsen , Jessica M. Sparrow , Carlyn A. M Duncan, Cody W. Koloski , Stefanie E. LaZerte , Bryan J. Cassone. The impact of climatic factors on the population dynamics of common mosquito vector species in the Canadian Prairies Status: Finalizing manuscript.
3. **Cole Baril**, Carlyn A. M Duncan, Bryan J. Cassone. Arbovirus surveillance and metatranscriptomic sequencing of mosquitoes in the Canadian Prairies. Status: Finalizing manuscript.

Presentations

Mosquito-borne bunyavirus surveillance and mosquito-weather relationships in Manitoba

Winnipeg, Manitoba

Designed and delivered a research presentation for the August 23 West Nile Virus Scientific Committee Meeting

2022

Mosquito Surveillance and California Serogroup in Manitoba

Winnipeg, Manitoba

Designed and delivered a poster presentation for the August 10 National Vector Borne Disease Info Sharing Table

2022

Characterizing the Microbiome of Manitoban Mosquitoes

Winnipeg, Manitoba

Designed and delivered a poster presentation for the 2022 North Central Mosquito Control Association 2022 Annual Meeting

2022

Neglected mosquito-borne pathogen surveillance in Manitoba, Canada

Denver, Colorado

Designed and delivered a poster presentation for the 2021 Entomological Society of America Conference

2021

Mosquito Surveillance for California Serogroup and Cache Valley Viruses in Manitoba *Brandon, Manitoba*

Designed and delivered a research presentation for the 2020 Brandon University Science Seminar Series *2020*

Press

Research Connection - Brandon University *Brandon, Manitoba*

Authored an article titled 'Mosquito surveillance in Manitoba' *2022*

Shoal Lake Community Newsletter *Shoal Lake, Manitoba*

Research featured in the Shoal Lake June 2020 Newsletter *2020*

What's Up Yellowhead Newsletter *R.M. of Yellowhead*

Research Featured in the What's Up Yellowhead June 2020 newsletter *2020*

Cypress River Community Newsletters *R.M. of Victoria*

Research updates featured in Cypress River community newsletters *2020-2022*

Skills

Laboratory Skills

Skilled in the following laboratory procedures:

- RNA/DNA extraction
- Mosquito identification, handling, and rearing
- Reverse transcriptase reactions
- Polymerase chain reactions
- Polymerase chain reaction design
- Gel electrophoresis
- ELISA
- Aseptic techniques
- Media preparation and pouring
- RNA interference design
- Primer design and troubleshooting
- GeneXpert setup, machine and software
- m-PIMA setup and machine
- Containment Level 2+ (enhanced) laboratory best-practices

Laboratory Equipment

Familiar with the following laboratory equipment:

- Dissection and compound microscope
- Light microscope camera
- CDC light trap
- Ultracold freezer
- Micropipette and pipette
- Microcentrifuge
- Dry and wet bath
- Thermocycler
- Gel electrophoresis apparatus
- Bio-Rad ChemiDoc Imaging System
- Autoclave
- Incubator
- Fume hood
- Implen NanoPhotometer
- Microplate photometer
- Biological safety cabinet

Computer Skills

Through knowledge of the following programs and languages:

- Microsoft Office Suite (Word, Excel, PowerPoint, Teams, Sharepoint and Outlook)
- Zoom
- Windows
- Google Sheets
- Netlify (website hosting)
- Xaringon (HTML presentations)
- R
- RStudio
- RMarkdown & Markdown
- HTML
- CSS
- Markup
- Experience extracting information from the web in JSON, JavaScript and HTML formats
- Data Manipulation, transformation and organization using R
- Data visualization using R
- Experience building models (GLMMs) for mosquito- and sclerotinia-weather based modelling
- Familiar with the Environment Canada weather database
- Experience manipulating weather data

Bioinformatics

Expert knowledge of the following bioinformatics tools:

- Next generation sequencing analysis
- CLC Genomics Workbench
- Chan Zuckerberg ID
- MEGAX for phylogenetic and sequence analysis
- Familiar with NCBI databases (e.g., nr, protein, nucleotide)
- Familiar with NCBI web applications (e.g., BLAST suite, ORFfinder, conserved domains)
- Visualization of NGS results using RStudio