Ryan Gourlie

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Statement

My principal interests concern the complex nature of host-pathogen interactions in the context of plant pathology, as well as the emergence and evolution of fungal pathogens. My goal is to run a research program focusing on these interests in order to significantly contribute to our understanding of the microbes that threaten global food production systems.

Education

• **PhD, Biomolecular Science** – *University of Lethbridge, Alberta, Canada* (2021 - present)
Thesis: On the evolution of *Pyrenophora tritici-repentis*
- Assembled and annotated >60 genomes of Ptr (long and short reads)
- Constructed and classified pangenome of Ptr
- Identified large-scale rearrangements between virulence races
- Discovered important virulence genes are associated with novel transposons
- Determined mechanism of virulence replication
- Performed GWAS identifying SNPs associated with specifc virulence types
- Comprehensive bioinformatics/genomics training of other PhD student
- One publication produced to-date

• **MSc, Environmental Science** – *University of Guelph, Ontario, Canada* (2016 - 2019)
Thesis: Resistance to fungicides in the plant pathogen *Microdochium nivale*
- Cultured and organized hundreds of isolates of *M. nivale* (snow mould)
- Tested isolates for sensitivity to fungicides in vitro and in the field
- Assembled and annotated 13 isolates sequenced with short-reads
- Detailed comparison of genes associated with fungicide resistances
- Two publications produced

• **BSc, Plant Science, Honours** – *University of Guelph, Ontario, Canada* (2008 - 2014)
Select course highlights:
- Plant Pathology • Applied Bioinformatics • Plant Physiology
- Molecular Aspects of Plant-Microbe Interactions • Forest Health and Disease
- Statistical Methods • Plant Propagation • Genetic Engineering of Plants

Current Position

• Cereal Pathology Research Assistant (2018 - present)
Agriculture and Agri-food Canada, Alberta, Canada
- Lead comparative genomics project of *P. tritici-repentis* (became PhD)
- Development and execution of bioinformatic pipelines
- Statistical/genomic analysis and support on various projects (e.g. *Fusarium* sp. qPCR data, *Puccinia striiformis* lineages, GWAS, etc.)
- Manage field operations for National Stripe Rust Disease Nursery: organizing, seeding, inoculating, and rating symptoms for >10,000 lines of cereal germplasm each season
- Support field operations for the National Bunt Disease Nursery

- Survey pathogen populations for emergence of new virulence races
- Write and edit manuscripts for publication
- Assist with managing undergraduate students and contract employees
- Manage lab procurements, lab assets, and inventories
- Six publications produced to-date

Relevant Past Work Experience

- Plant Pathology Lab Technician – *University of Guelph, Ontario, Canada* (2016)
- Plant Pathology Teaching Assistant – *University of Guelph, Ontario, Canada* (2016/14)
- Tree Nursery Lead – *Starburn Nursery, Alberta, Canada* (2015)
- Wildlife Nutrition Research Assistant – *Toronto Zoo, Ontario, Canada* (2014)
- Fungal Ecology Research Assistant – *University of Guelph, Ontario, Canada* (2013)

Top Skill Sets

• Fungal plant pathology	• Comparative genomics	• Bioinformatics
• Molecular biology	• Statistical analysis	• Technical writing
• Field Trials	• Lab management	• Teaching/instruction

Volunteer Work

- Graduate Student Symposium Coordinator (2024)
- Bioinformatics Instructor (2023 - present)
- LRDC Career Development Committee (2020 - present)
- Photography Volunteer – Focus on Nature (2014 - 2016)

Conferences/Meetings

• AAFC Graduate Symposium	(Presenter, Organizer)	(2024)
• UoLethbridge Graduate Symposium	(Presenter, Winner)	(2024)
• European Conference on Fungal Genetics	(Poster)	(2023)
• BioNet Alberta	(Presenter)	(2024-2020)
• Intl. Symposium on Cereal Leaf Blights	(Presenter)	(2022)
• GSA Fungal Genetics	(Presenter/Poster)	(2022)
• Plant Pathology Society of Alberta	(Presenter, Director, Organizer)	(2022/21/20)
• Canadian Phytopathological Society	(Presenter/Poster)	(2022/19/17)
• Prairie Grain Development Committee	(Voting Member)	(2022/21/20)
• Tri-Society (CPS-CSA-CSHS) Conference	(Poster)	(2021)
• CanFunNet Mycology Conference	(Presenter)	(2021)
• APS Plant Health	(Poster)	(2021)
• European Conference on Fungal Genetics	(Poster)	(2019)
• European Turfgrass Society Conference	(Presenter)	(2018)
• Ontario Turfgrass Symposium	(Presenter)	(2018/17/16)
• International Turfgrass Research Conference	(Presenter)	(2017)
• Ontario Pest Management Conference	(Presenter)	(2016)

Awards/Scholarships

British Society of Plant Pathology Junior Fellowship	(£3K)	(2023)
• Report https://www.bspp.org.uk/category/fellowship-reports/junior-fellowships		
Alberta Graduate Excellence Scholarship (AGES)	($30K)	(2023/22)
Alberta Innovates Graduate Student Scholarship	($2K)	(2022)
University of Lethbridge Research Award	($9K)	(2024-21)

PhD Agriculture Admission Scholarship	($2K)	(2021)

Memberships

Canadian Phytopathological Society	(Student/Technician)	(2015 – present)
Plant Pathology Society of Alberta	(Director)	(2018 – present)
Prairie Grain Development Commission	(Voting Member)	(2020 – present)
British Society of Plant Pathology	(Student/Technician)	(2021 – present)

Publications to date

Gourlie, R., Nasr-Sharif, M., and R. Aboukhaddour. 2024. Transposable elements and their effects on host fitness. Writing manuscript.

Gourlie, R., McDonald, M., and R. Aboukhaddour. 2024. Genome-wide association reveals SNPs associated with the ToxC phenotype in *Pyrenophora triciti-repentis* (tan spot). Writing manuscript

Gourlie, R., McDonald, M., Hafez, M., and R. Aboukhaddour. 2024. Unraveling the replication of the chlorosis inducing multi-copy gene *ToxB* in the fungal wheat pathogen *Pyrenophora tritici-repentis* (tan spot). Writing manuscript.

Hafez, M., **Gourlie, R.**, McDonald, M., Telfer, M., Carmona, M.A., Sautua, F.J., Moffat, C.S., Moolhuijzen, P.M.,See, P.T., and R. Aboukhaddour. 2023. Evolution of the ToxB gene in *Pyrenophora tritici-repentis* and related species. *Molecular Plant-Microbe Interactions, In-press*.

Gourlie, R., McDonald, M., Hafez, M., Ortega-Polo, R., Low, K.E., Abbott, D.W, Strelkov, S.E., Daayf, F., and R. Aboukhaddour. 2022. The pangenome of the wheat pathogen *Pyrenophora tritici-repentis* reveals novel transposons associated with necrotrophic effectors ToxA and ToxB. *BMC Biology*, 20(1):1-21

Gourlie, R., and T. Hsiang. 2021. Resistance to the demethylation inhibitor fungicide propiconazole in a Canadian population of *Microdochium nivale*. *International Turfgrass Society Research Journal*, 14(1):963-966

Hafez, M., **Gourlie, R.**, Telfer, M., Schatz, N., Turkington, T.K., and R. Aboukhaddour. 2021. Diversity of *Fusarium* spp. Associated with Wheat Node and Grain in Representative Sites Across the Western Canadian Prairies. *Phytopathology*, 112(5):1003-1015

Ghanbarnia, K., **Gourlie, R.**, Amundsen, E., and R. Aboukhaddour. 2021. The changing virulence of stripe rust in Canada from 1984 to 2017. *Phytopathology*, 111:1840-1850

Hafez, M., **Gourlie, R.**, Despins, T., Turkington, T.K., Friesen, T.L., and R. Aboukhaddour. 2020. *Parastagonospora nodorum* and related species in Western Canada: genetic variability and effector genes. *Phytopathology*, 110(12):1946-1958

Wei, B., Moscou, M.J., Sato, K., **Gourlie, R.**, Strelkov, S., and R. Aboukhaddour. 2020. Identification of a locus conferring dominant susceptibility to *Pyrenophora triciti-repentis*. *Frontiers in Plant Science*, 11:58

Gourlie, R. and T. Hsiang. 2017. Resistance to dicarboximide fungicides in a Canadian population of

Microdochium nivale. *International Turfgrass Society Research Journal*, 13 (1):133-138

Academic References (contact information on request)

- Dr. Reem Aboukhaddour, Agriculture and Agri-food Canada/University of Lethbridge, Supervisor and PhD Co-advisor
- Dr. Megan McDonald, University of Birmingham, PhD Committee Member and Collaborator
- Dr. Mohamed Hafez, Agriculture and Agri-food Canada, Colleague
- Dr. Dmytro Yevtushenko, University of Lethbridge, PhD Co-advisor
- Mouldi Zid, Agriculture and Agri-food Canada, Colleague
- Dr. Tom Hsiang, University of Guelph, MSc Advisor
- Bohan Wei, University of Alberta, Colleague/Student (taught them bioinformatics basics)