

Kevin Mercurio

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EDUCATION

Doctor in Philosophy, Microbiology **Mar 2021 – present**
Trinity College, University of Dublin **Dublin, Ireland**

- Thesis Title: Unravelling the relationship between host miRNAs and the gut microbiome in IBD.
- Supervisor: Dr. Sinéad Corr

Master of Science in Biochemistry **Sept 2017 – April 2020**
University of Ottawa **Ottawa, Ontario**

- Thesis Title: Identifying genes required for *Saccharomyces cerevisiae* growth in mucin.
- Supervisor: Dr. Kristin Baetz

Honours Bachelor of Science, Major in Biochemistry (with Co-op) **Sept 2011 – Jun 2016**
University of Ottawa **Ottawa, Ontario**

- Thesis Title: Identifying novel genes involved in biofilm-specific antibiotic resistance in *Pseudomonas aeruginosa*.
- Supervisor: Dr. Thien-Fah Mah

RESEARCH EXPERIENCE

Graduate Student **Mar 2021 – present**
Trinity College, University of Dublin **Dublin, Ireland**

- Determining the role miR-21 plays within an inflammatory bowel disease model and characterize its impact on the gut epithelium, immunological response, microbiota and metabolism.

Laboratory Technician **Sept 2020 – Jan 2021**
University of Ottawa **Ottawa, Ontario**

- Provided general technical assistance and laboratory procedures as needed, routine maintenance and cleaning of equipment and glassware.
- Supported in laboratory ordering and stockpiling.
- Performed strain construction, live-cell microscopy, western blotting with yeast to understand the effect of undesired industrial toxins like adipic acid on cellular growth.

Graduate Student **Sept 2017 – Apr 2020**
University of Ottawa **Ottawa, Ontario**

- Utilized genetics and microscopy tools to determine how yeast metabolize mucin as an energy source, such as how fungi survive in the human gut.
- Performed high-throughput screening of the *Saccharomyces cerevisiae* Deletion Mutant Array, and RNA sequencing that led to the identification of important genes for growth in mucin.

Undergraduate Student (Honours)
University of Ottawa

Sept 2015 – Aug 2016
Ottawa, Ontario

- Investigated biofilm-specific antibiotic resistance in *Pseudomonas aeruginosa* found in cystic fibrosis patients using minimal bactericidal concentration assays on transposon-insertion mutants.
- Conducted qPCR analyses comparing gene expression between biofilm and planktonic cells.
- Constructed gene deletion mutants via plasmid manipulation and gene recombination.

Co-op Researcher
FPIInnovations

Sept 2014 – Dec 2014
Montreal, Quebec

- Enhanced the efficiency of enzymatic hydrolysis on softwood paper pulp material, as a means to obtain useful sugars for biochemical synthesis.
- Utilized cellulases, hemicellulases and performance-enhancing additives (acids, sulphites) to break down problematic lignin biomass, leading to optimal product formation.
- Developed strong communication skills through presentations to company superiors.

Co-op Researcher
University of Alberta

May 2014 – Aug 2014
Edmonton, Alberta

- Developed a robust method for spectrophotometric quantification of phage virulence.
- Established microplate virulence assay protocols using different infection conditions by varying parameters like temperature, adsorption efficiency and infection media.

PEER-REVIEWED PUBLICATIONS AND PRESENTATIONS

Publications

- **Mercurio K.**, Stiegeler S., Iancu M. A., Corr S. C. (2021). The Impact of MicroRNAs during Inflammatory Bowel Disease: Effects on the Mucus Layer and Intercellular Junctions for Gut Permeability. *Cells*, 2021, 10, 3358.
- **Mercurio K.**, Singh D., Walden E., Baetz K. (2021). Global analysis of *Saccharomyces cerevisiae* growth in mucin. *G3*, doi: 10.1093/g3journal/jkab294.
- O'Callaghan A. A., Dempsey E., Iyer N., Stiegeler S., **Mercurio K.**, Corr S. (2021). Intestinal Metabolites Influence Macrophage Phagocytosis and Clearance of Bacterial Infection. *Frontiers in Cellular and Infection Microbiology*, 11: 622491.
- Fletcher E., **Mercurio K.**, Walden E., Baetz K. (2021). A yeast chemogenomic screen identifies pathways that modulate adipic acid toxicity. *iScience*, 24(4): 102327.
- Storms Z., Teel M., **Mercurio K.**, Sauvageau D. (2019). The Virulence Index: A Metric for Quantitative Analysis of Bacteriophage Virulence. *PHAGE: Therapy, Applications, and Research*, 1: 1X. Invited article for the preview/inaugural issue.
- Fletcher E., Gao K., **Mercurio K.**, Ali M., Baetz K. (2019). Yeast chemogenomic screen identifies distinct metabolic pathways required to tolerate exposure to phenolic fermentation inhibitors ferulic acid, 4-hydroxybenzoic acid and coniferyl aldehyde. *Metabolic Engineering*, 52: 98-109.

Poster and Oral Presentations

- **Mercurio K.** (2021). *Investigating epithelial-specific mechanisms of miR-21 influence on inflammation and the gut microbiome*. Presentation for Trinity College Dublin Department of Microbiology Progress Reports, Dublin, Ireland.
- **Mercurio K.** (2019). *Identifying genes required for *Saccharomyces cerevisiae* growth in mucin*. Presentation for the International Conference on Yeast Genetics and Molecular Biology, Gothenburg, Sweden.
- **Mercurio K.**, Singh D., Baetz K. (2019). *Identifying genes required for *Saccharomyces cerevisiae* growth in mucin*. Primary author of abstract and poster for the Ottawa Institute of Systems Biology Conference, Cornwall, Ontario.
- **Mercurio K.** (2019). *Identifying genes required for *Saccharomyces cerevisiae* growth in mucin*. Presentation for the University of Ottawa Faculty of Medicine's Seminar Day, Ottawa, Ontario.
- **Mercurio K.**, Butcher J., Stintzi A., Baetz K. (2018). *Determining the survival ability of budding yeast in human gut-like conditions*. Primary author of abstract and poster for the Department of Biochemistry, Microbiology and Immunology's Poster Day, Montebello, Quebec.
- **Mercurio K.**, Hall C. W., Mah T. F. (2016). *Identification of a novel gene involved in *Pseudomonas aeruginosa* biofilm-specific resistance to antibiotics*. Primary author of abstract and poster for the Canadian Society of Microbiologists' Conference, Toronto, Ontario.
- **Mercurio K.** (2016). *Floxcatcher: A study on predicted biofilm-specific genes in *P. aeruginosa* and their impact on ciprofloxacin resistance*. Presentation for the University of Ottawa's Biochemistry Program Seminar Course (BCH4932), Ottawa, Ontario.
- **Mercurio K.**, Mah T. F. (2016). *The impact of predicted biofilm-specific genes on ciprofloxacin resistance in *Pseudomonas aeruginosa**. Primary author of abstract and poster for the University of Ottawa's Undergraduate Biochemistry Program Poster Day, Ottawa, Ontario.
- **Mercurio K.** (2014). *Finding the Midas Touch: Strategies to increase the value of a lignin-rich softwood high yield pulp fraction*. Presentation for the FPInnovations' Co-op End-of-Term, Montreal, Quebec.
- **Mercurio K.**, Storms Z., Sauvageau D. (2014). *Determining a method of quantifying bacteriophage virulence*. Primary author of abstract and poster for the University of Alberta's Research Experience (UARE) Poster Symposium, Edmonton, Alberta.

HONOURS AND AWARDS

- Participant in the FameLab Ireland National Finals (2021)
- Winner of the FameLab Ireland National Video Heat (2021)
- Selected postgraduate for the Annual LERU Summer Conference (TCD, 2021)
- Provost's PhD Project Award (TCD, 2021)
- 3rd in audience vote in the National Canadian Science Grand Slam (2020)
- 1st place at M.Sc. Biochemistry Seminar Day (uOttawa, 2019)
- Graduate Studies Leadership Award for Student Engagement (uOttawa, 2018)
- *Cum laude* undergraduate academic honours (uOttawa, 2016)
- NSERC Industrial Undergraduate Student Research Award (2014)
- Entrance scholarship valued at \$8,000 (uOttawa, 2011-2012)
- Ontario Scholar Award (St. Paul Catholic High School, 2011)

ANALYTICAL AND PROFESSIONAL TRAINING

Student Mentorship

- Participating in the **Undergraduate Research in Natural and Clinical Science in Technology (URN CST) Journal's Mentorship Program** for academic writing in the field of gut health.
- Hired as a PhD Tutor for **Scholar's Ireland** in collaboration with AccessEd and Trinity Access, bringing university-style tutorials to high school students in underrepresented communities.
- Supervised an undergraduate student in classic molecular biology techniques from the **Faculty of Medicine's Translational and Molecular Medicine Program**.
- Mentored an undergraduate student in chemogenomic screening as part of the **Faculty of Medicine's annual DEGREE Program**.

Technologies for Microbiome Science and Engineering (TechnoMiSE)

- Part of the Natural Science and Engineering Research Council of Canada's Collaborative Research and Training Experience Programs (NSERC-CREATE).
- Developed bioinformatics skills in workshops about the analysis of large datasets via RStudio.
- Advanced science communication skills through practicing oral presentations and networking with industry partners in microbiome science.
- Expanded on skills such as time-management, productivity, stress management and work-life balance through professional Mitacs workshops.
- To encourage trainee participation in program development, organized the TechnoMiSE Student Committee for trainee networking and project support.

OTHER PROFESSIONAL EXPERIENCE

Curriculum Vitae Reviewer Trinity Career Services

**May 2021 – present
Dublin, Ireland**

- Provide critical feedback on CVs, LinkedIn profiles and cover letters to undergraduates

Trade Commissioner Global Affairs Canada

**Nov 2016 – Aug 2017
Ottawa, Ontario**

- Mandate was to support the Canadian biopharmaceutical and biotechnology sector.
- Contacted company administration for sector insight and support in business development.
- Designed technical reports and presentations about the Canadian impact in emerging fields such as immune-oncology and gene therapy.
- Participated in interdepartmental sector discussions and government conferences.

Risk Profiler (Co-op) Canadian Food Inspection Agency

**Jan 2014 – Apr 2014
Ottawa, Ontario**

- Gathered and organized massive amounts of information as a basis for food safety reports.
- Assessed the severity of chemical and biological hazards prevalent in common Canadian food items, such as cadmium in rice products and lead in tea leaves.

VOLUNTEER EXPERIENCE

Chapter Manager **Oct 2021 – present**
Pint of Science Ireland **Dublin, Ireland**

- Collaborate with volunteers across Dublin to host science communication events, bringing researchers and citizens together in informal settings.

Public Relations Officer **Oct 2021 – present**
Dublin University Microbiological Society **Dublin, Ireland**

- Create social media campaigns for the society in promoting educational seminars, workshops and social events to undergraduates, postgraduates and professors in the society.

Graduate Mentor **Oct 2021 – present**
URNCST Journal **Ottawa, Ontario**

- Support undergraduate students' development in communication skills via academic writing for conference manuscripts.

Policy Coordinator **Feb 2021 – present**
Science Slam Canada **Ottawa, Ontario**

- As part of the restructuring of the now non-profit, responsible for devising fundamental policies of the organization including finances, volunteer coordination and event planning.

Section Reviewer **Oct 2020 – Sept 2021**
University of Ottawa's Journal of Medicine (UOJM) **Ottawa, Ontario**

- Performed first-line peer review, providing critical appraisal and comments on articles of various topics related to health.

Mentorship Coordinator **Sept 2019 – Aug 2020**
Science to Business Network (S2BN) **Ottawa, Ontario**

- To bridge the gap between science and industry, created the inaugural S2BN Mentorship program for STEM-based graduate students and post-doctoral fellows in the Ottawa region.
- Devised promotional materials, organized call for applications and conducted matchmaking between trainees and governmental/industry professionals.
- Produced marketing materials for the annual S2BN Academia to Industry Meeting (AIM) linking graduate students and other trainees with professionals in government, industry and NGOs.

Judge **April 2018 – March 2020**
Ottawa Regional Science Fair (ORSF) **Ottawa, Ontario**

- Evaluated scientific projects in the field of biological sciences for elementary and high-school students in the Ottawa region.

Student Representative **Nov 2017 – Aug 2019**
Faculty of Medicine Graduate Student Recruitment Committee **Ottawa, Ontario**

- Supported administration in developing strategies to encourage recruitment to the Faculty of Medicine's graduate programs.
- Played a major role in the development of the Faculty's DEGREE Shadowing Program for local and provincial undergraduate students.

Student Committee Leader **Oct 2017 – Aug 2019**
TechnoMiSE Student Association **Ottawa, Ontario**

- Supported the communication between program coordinators and program trainees.
- Encouraged interpersonal and networking skill development through the organization of social events between trainees.

Vice-President of Academic Affairs **May 2018 – April 2019**
Department Graduate Student Association (BMIGSA) **Ottawa, Ontario**

- Represented graduate students both at the departmental and faculty level.
- Communicated academic feedback to department program directors and administration while relaying important information back to the students.
- Organized academic-related events throughout the school year such as scientific panels, skills workshops and Faculty of Medicine's Career Day.
- To address student confusion about educational and research issues, worked with the faculty administration to design orientation workshops for trainees.
- Actively engaged the student community through the organization of social events.

Vice-President of Social Affairs **Sept 2015 – Apr 2016**
University of Ottawa Healthcare Symposium (UOHS) **Ottawa, Ontario**

- Organized the largest conference at the university directed towards the challenges of a frequently changing healthcare field.
- Responsible for coordinating volunteer teams and planning event catering.
- Managed social events and activities, such as designing the "Socrates Cafe" event for discussion amongst attendees on relevant healthcare issues.

Student Educator **Sept 2015 – Apr 2016**
University of Ottawa Health Services **Ottawa, Ontario**

- Member of Leave The Pack Behind (LTPB): an Ontario university tobacco information program.
- Informed the student body about health-related services and events offered by the organization through in-person interactions.
- Organized events such as CO-testing and contests with the intent of providing information on the disadvantages of all types of smoking, and the benefits of quitting or reducing.

OTHER INFORMATION

Podcast Host

Mar 2020 – present

Metaphorigins

Virtual

- Host personal podcast about the origins of English expressions, the science behind general communication, and techniques for science communication to the public.
- Interview graduate students and early career researchers from all backgrounds around the world about how to engage the scientific community and the public.

Short Story Feature

Nov 2021

Healthy Populations Journal

Halifax, Nova Scotia

- Featured author of the short story The Revival, published in the journal's 2nd Volume, Fall Edition (<https://ojs.library.dal.ca/hpj/article/view/11081>)

Short Story Feature

2020-2021

Health Science Inquiry

Toronto, Ontario

- Featured author of the short story Pandemonium, published in the journal's 12th Volume about infectious disease (<https://healthscienceinquiry.com/index.php/hsi/issue/view/13/14>)
- Featured author of the short story Blue Elephant, published in the journal's 11th Volume about determinants of health (<https://healthscienceinquiry.com/index.php/hsi/article/view/322/301>)

Contributing Writer

May 2021

The University Times

Dublin, Ireland

- Writer on select topics regarding science initiatives that impact students at Trinity College Dublin.
- Published article about the SciComm Collective sponsored by Ireland's Department of Health: <http://www.universitytimes.ie/2021/06/how-the-science-communication-collective-is-battling-misinformation/>

REFERENCES

Available upon request.