

# Kevin Mercurio

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## EDUCATION

### **Doctor in Philosophy, Microbiology Trinity College, University of Dublin**

**Mar 2021 – present  
Dublin, Ireland**

- Thesis Title: The mechanistic impact of miR-21 on gut barrier integrity and susceptibility to intestinal inflammation.
- Supervisor: Dr. Sinéad Corr

### **Master of Science in Biochemistry University of Ottawa**

**Sept 2017 – April 2020  
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) University of Ottawa**

**Sept 2011 – Jun 2016  
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 Trinity College, University of Dublin**

**Mar 2021 – present  
Dublin, Ireland**

- Determine the role miR-21 plays within an inflammatory bowel disease model and characterize its impact on the gut epithelium, immunological response, microbiota and metabolism.
- Conduct molecular biology assays; qPCRs, immunoblotting, confocal microscopy, cell culture.
- Support the management of trials for murine genetic knockout and inflammation models; animal handling, tissue isolation, genotyping.

### **Laboratory Technician University of Ottawa**

**Sept 2020 – Jan 2021  
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**  
**University of Ottawa**

**Sept 2017 – Apr 2020**  
**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.

**Co-op Researcher**  
**University of Alberta**

**May 2014 – Aug 2014**  
**Edmonton, Alberta**

- 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*, 2021, 11(11), 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.

## Oral Presentations

- **Mercurio K.** (2022). *The mechanistic impact of miR-21 on gut barrier integrity and susceptibility to intestinal inflammation*. Presentation for Trinity College Dublin Department of Microbiology Postgraduate Symposium (18-month), Dublin, Ireland.
- **Mercurio K.** (2022). *The mechanistic impact of miR-21 on intercellular junctions, gut microbiota and susceptibility to intestinal inflammation*. Presentation for the School of Genetics and Microbiology Early Career Researcher Seminar Series, Dublin, Ireland.
- **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 Postgraduate Symposium (6-month), 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.** (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.** (2018). *Wanted: *Saccharomyces cerevisiae* in the gut. Dead or alive?*. Presentation for the Department of Biochemistry, Microbiology and Immunology's Trainee Seminar Series, Ottawa, 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.** (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.

## Poster Presentations

- **Mercurio K., Corr S. C.** (2022). *The mechanistic impact of miR-21 on gut epithelial intercellular junctions and host-microbiome interactions*. Primary author of abstract and poster for the School of Genetics and Microbiology Early Career Researcher Symposium, Dublin, Ireland.
- **Mercurio K., Corr S. C.** (2022). *The mechanistic impact of miR-21 on gut epithelial intercellular junctions and host-microbiome interactions*. Primary author of abstract, poster and flash presentation for the Microbiology Society UK's Focused Meeting, Dublin, Ireland.
- **Mercurio K., Corr S. C.** (2022). *The mechanistic impact of miR-21 on gut epithelial intercellular junctions and host-microbiome interactions*. Primary author of abstract and poster for the APC Microbiome Symposium, Cork, Ireland.
- **Mercurio K., Corr S. C.** (2022). *The mechanistic impact of miR-21 on intercellular junctions and susceptibility to intestinal inflammation*. Primary author of abstract and poster for the Irish Society of Immunology, Maynooth, Ireland.
- **Mercurio K., Corr S. C.** (2022). *The mechanistic impact of miR-21 on intercellular junctions and susceptibility to intestinal inflammation*. Primary author of abstract and poster for the Dublin University Microbiological Society's Focused Meeting, Dublin, Ireland.
- **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.**, 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.**, 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.**, 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

- Winner of the FameLab Ireland National Video Heat (2021)
- Selected postgraduate for the Annual LERU Summer Conference (TCD, 2021)
- 3<sup>rd</sup> in audience vote in the National Canadian Science Grand Slam (2020)
- 1<sup>st</sup> 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)

## ANALYTICAL AND PROFESSIONAL TRAINING

### Student Demonstration & Mentorship

- **Demonstrator, School of Genetics and Microbiology** for undergraduate labs teaching methods like sterile technique, cell culture, strain identification, fluorescence microscopy.
- **Tutor, Scholars Ireland** in collaboration with AccessEd and Trinity Access, bringing university-style tutorials to high school students in underrepresented communities.
- **Mentor, URNCST Journal Mentorship Program** for academic writing in the field of gut health.
- **Supervisor, Faculty of Medicine's Translational and Molecular Medicine Program** for an undergraduate student in classic molecular biology techniques.
- **Supervisor, Faculty of Medicine Annual DEGREE Program** an undergraduate student in chemogenomic screening.

### Technologies for Microbiome Science and Engineering (TechnoMiSE)

- 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.

## **SOCIETIES AND AFFILIATIONS**

- Member of the Microbiology Society, UK & Ireland
- Member of the Irish Immunological Society, Ireland
- Co-Director for Pint of Science Charity, Ireland
- Chairperson for the Dublin University Microbiological Society, Ireland

## **OTHER PROFESSIONAL EXPERIENCE**

**PhD Tutor** **Sept 2021 – present**  
**Scholar's Ireland** **Dublin, Ireland**

- Bringing university-style tutorials to high school students in underrepresented communities.
- Lecture groups of 15 students about microbiology, molecular biology, and microbiome research.

**Curriculum Vitae Reviewer** **May 2021 – present**  
**Trinity Career Services** **Dublin, Ireland**

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

**Trade Commissioner** **Nov 2016 – Aug 2017**  
**Global Affairs Canada** **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.

**Junior Trade Commissioner (Co-op)** **Jun 2015 – Aug 2015**  
**Global Affairs Canada** **Ottawa, Ontario**

- Gathered intel on the domestic activity of the Canadian Life Sciences industry.
- Acquired fundamental understanding of the fields of immuno-oncology, gene therapy and autoimmune disease for the division.
- Collaborated with team members to design reports and presentations for the division.

**Risk Profiler (Co-op)** **Jan 2014 – Apr 2014**  
**Canadian Food Inspection Agency** **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**

**Co-Director** **Sept 2021 – May 2022**  
**Pint of Science Ireland** **Dublin, Ireland**

- Manage local teams in major cities across Ireland as part of the science communication festival.

**Chairperson** **Sept 2021 – Aug 2022**  
**Dublin University Microbiological Society** **Dublin, Ireland**

- Responsible for society funding and managing academic/social events in the local microbiology community in Trinity College Dublin.

**Public Relations Officer** **Oct 2021 – Aug 2022**  
**Dublin University Microbiological Society** **Dublin, Ireland**

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

**Graduate Mentor** **Sept 2021 – Aug 2022**  
**URNCST Journal** **Ottawa, Ontario**

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

**Chapter Manager** **Oct 2021 – May 2022**  
**Pint of Science Ireland** **Dublin, Ireland**

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

**Policy Coordinator** **Feb 2021 – Jan 2022**  
**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, Ontario**  
**Ottawa Regional Science Fair (ORSF)**

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

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

- 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**  
**Ottawa, Ontario**  
**Department Graduate Student Association (BMIGSA)**

- 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.

**In-School Mentor** **Oct 2015 – Jun 2016**  
**Ottawa, Ontario**  
**Big Brothers Big Sisters (BBBSO)**

- Supervised a Little brother at his elementary school on a weekly basis.
- Designed activities to develop communication and creativity skills.
- Signified the importance of education and developing positive relationships with family, friends and members in the community.

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

- 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**  
**Ottawa, Ontario**  
**University of Ottawa Health Services**

- 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.

**Contributing Writer** **December 2022**  
**Irish Green Labs** **Dublin, Ireland**

- Published article about how TCD postgraduates and postdoctoral fellows are advocating for green research practices: <https://irishgreenlabs.org/how-tcd-postgraduates-and-postdoctoral-fellows-are-advocating-for-green-research-practices/>.

**Short Story Feature** **2020-2022**  
**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>)

**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>)

**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/>