BME 750
Selected Topics in Biomedical Informatics

Under Review | Fall 2025

Proposal Information

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

- Mike Grivicic
- Tim Weber-Kraljevski
- Diana Goncalves
- Melanie Figueiredo
- Ashley Day

Effective Date & Career

Career
Graduate

Important!

Quest Course ID

Effective Term and Year
Fall 2025

Offering Number

Proposal Details

Proposal Type
New

Academic Unit Approval
02/28/2025

Rationale for New Course
This course will give students the option of taking a reading course on topics in Biomedical Informatics. Will also give flexibility to schedule elective courses related to Biomedical Informatics that do not have their own course subject code and number.

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Subject Code
BME

Number
750

Title
Selected Topics in Biomedical Informatics

Abbreviated Title
Topics in Biomed Informatics

Description
Consult the schedule of classes for specific topics being offered.

Units
0.50

Exceptions to fees or academic progress units

Components
ReadingProjectLecture

Primary Component
Lecture

Grading Information

Grading Basis
Numerical Grading Basis

Cross-Listing Information

Is this course cross-listed?
No

Repeatable Courses

Can this course be repeated for credit?
Yes

Total Completions Allowed
05

Allow Multiple Enrol in a Term
Yes

Enrolment Rules

Consent to Add
No consent required

Consent to Drop
No consent required

Prerequisites
No Rules

Corequisites
No Rules

Antirequisites
No Rules

Course Notes

Fee Statement

Workflow Information

Workflow Path
Committee approvals

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

Admin Only - Proposal

Impact Changes

Requisites in Quest
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Senate Council Meeting Date

Admin Only

Include in Calendar

End Date
No Date Chosen

Calendar Activation Date

Requisite Summary

Admin Notes

Integration Message

Status (Admin Override)
Active

Quest Course ID (Admin Override)

Offering Number (Admin Override)

MSE 744
Intellectual Property Strategy

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Title
- Abbreviated Title
- Description
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2024

Quest Course ID
14931

Offering Number
1

Proposal Details

Proposal Type
Change

Academic Unit Approval
03/03/2025

Rationale for Change
Updating the course title and description: When MSE 744 was developed in 2010, the goal was to create a course with broad coverage, and the title "Science and Technology Policy" was considered appropriate. However, over time, it has become clear that students are increasingly interested in intellectual property issues. While the course title and content may seem somewhat different, approximately 60–70% of the current topics are centered around intellectual property rights. Therefore, changing the title would be appropriate to attract more students to the course.

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Management Science and Engineering

Subject Code
MSE

Number
744

Proposed
Title
Intellectual Property Strategy

Existing
Title
Science and Technology Policy

Proposed
Abbreviated Title
Intellectual Property Strategy

Existing
Abbreviated Title
Science and Technology Policy

Proposed

Description

Managing intellectual property (IP) effectively is crucial for sustaining competitive advantage and fostering growth. The course develops a deep understanding of the strategic dimensions associated with IP and the necessary analytical skills needed to support strategic decisions concerning IP. The course uses a hybrid approach using elements such as theoretical models and practical case studies. The course will cover various types of intellectual property, such as patents, trademarks, copyrights, and trade secrets, and topics such as IP protection, enforcement, commercialization, licensing agreements, and IP risk management. Previous study of economics (e.g., MSE 607) is recommended but not required.

Existing

Description

Science and Technology are increasingly viewed as important tools to promote the social, economic, and political goals of modern economies. Accordingly, science and technology (S&T) policy issues have assumed prominence in contemporary policy discourse. Firms are often operated under different policy environments and their strategies should be formulated under the various environments. This course provides students with the background and tools needed to critically evaluate issues in S&T policy debates. After reviewing the basics of science and technology policy, we will discuss a few instruments of S&T policy, e.g., intellectual property rights, tax and subsidy, public funding for research, and prizes. Throughout the course, we will integrate the theoretical discussions with cases of contemporary S&T policy issues. Previous study of economics is required, such as MSCI 607.

Units

0.50

Exceptions to fees or academic progress units

Components

LectureReading

Primary Component

Lecture

Grading Information

Grading Basis

Numerical Grading Basis

Cross-Listing Information

Is this course cross-listed?

No

Repeatable Courses

Can this course be repeated for credit?

No

Enrolment Rules

Consent to Add

Instructor consent required

Consent to Drop

No consent required

Prerequisites

No Rules

Corequisites

No Rules

Antirequisites

- Not completed nor concurrently enrolled in: MSCI760 (Topic 31)

Course Notes

Fee Statement

Workflow Information

Workflow Path

Committee approvals

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

Admin Only - Proposal

Impact Changes

Requisites in Quest

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Senate Council Meeting Date

Admin Only

Include in Calendar
Graduate

End Date
No Date Chosen

Calendar Activation Date
08/23/2024

Special Consent Required to Add
Instructor Consent

Requisite Summary
Antireq: MSCI 760 - Topic 31, Science & Technology Policy

Proposed
Admin Notes

Integration Message
Change: Successfully received by Quest

Existing
Admin Notes
Per April 2024 SGRC.

Status (Admin Override)
Active

Quest Course ID (Admin Override)
14931

Offering Number (Admin Override)
1

SYDE 677
Medical Imaging

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Effective Term and Year
- Is this course cross-listed?
- Antirequisites
- Cross-Listed Courses

Effective Date & Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2023

Quest Course ID
3156

Offering Number
1

Proposal Details

Proposal Type
Change

Academic Unit Approval
02/13/2025

Rationale for Change
The reason for this change is to cross-list SYDE 677 with BME 641, as Biomedical Engineering students will be able to take this course as part of their field-specific course requirement. No other changes will be made to this course.

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Systems Design Engineering

Subject Code
SYDE

Number
677

Title
Medical Imaging

Abbreviated Title
Medical Imaging

Description
This course introduces the fundamental concepts for medical imaging which include medical image formation (X-ray, CT, MRI, sonography); storage and formats (DICOM, DICOM RT, PACS); visualization, detection and analysis (enhancement, segmentation, registration, compression); safety and regulations for imaging devices & software (IEEE standards, Health Canada Licensing, FDA Clearance).

Units
0.50

Exceptions to fees or academic progress units

Components
Lecture

Primary Component
Lecture

Grading Information

Grading Basis
Numerical Grading Basis

Cross-Listing Information

Proposed
Is this course cross-listed?
Yes

Existing
Is this course cross-listed?
No

Proposed
Cross-Listed Courses
BME 641 - Medical Imaging (0.50) | **Under Review**

Existing
Cross-Listed Courses

Repeatable Courses

Can this course be repeated for credit?
No

Enrolment Rules

Consent to Add
No consent required

Consent to Drop
No consent required

Prerequisites
No Rules

Corequisites
No Rules

Antirequisites

- **Not completed nor concurrently enrolled in:**
  - **Course Not Found**

Course Notes

Fee Statement

Workflow Information

Workflow Path
Committee approvals

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

Admin Only - Proposal

Impact Changes

Requisites in Quest
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Senate Council Meeting Date

Admin Only

Include in Calendar
Graduate

End Date
No Date Chosen

Calendar Activation Date
09/01/2023

Requisite Summary

Admin Notes

Integration Message

Status (Admin Override)
Active

Quest Course ID (Admin Override)
3156

Offering Number (Admin Override)
1

SYDE 684
Materials Biocompatibility

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Effective Term and Year
- Is this course cross-listed?
- Antirequisites
- Cross-Listed Courses

Effective Date & Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2023

Quest Course ID
14500

Offering Number
1

Proposal Details

Proposal Type
Change

Academic Unit Approval
02/13/2025

Rationale for Change
The reason for this change is to cross-list SYDE 684 with BME 611, as Biomedical Engineering students will be able to take this course as part of their field-specific course requirement. No other changes will be made to this course.

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Systems Design Engineering

Subject Code
SYDE

Number
684

Title
Materials Biocompatibility

Abbreviated Title
Materials Biocompatibility

Description
The course covers fundamental topics of biocompatibility of materials in medicine (polymers, ceramics, metals, composites, bioengineered materials). Fundamental principles of materials science (bonding, atomic/molecular structure) as well as interfacial engineering of materials will be reviewed. Materials response to biological systems such as corrosion, degradation, leaching and fracture will be studied in the context of specific biomedical applications. The host response to materials (immune, inflammatory response and coagulation) will also be treated. Specific examples of material interactions with biological systems such as bone, blood, skin and the eye will be studied.

Units
0.50

Exceptions to fees or academic progress units

Components
Lecture

Primary Component
Lecture

Grading Information

Grading Basis
Numerical Grading Basis

Cross-Listing Information

Proposed
Is this course cross-listed?
Yes

Existing
Is this course cross-listed?
No

Proposed
Cross-Listed Courses
BME 611 - Materials Biocompatibility (0.50) | **Under Review**

Existing
Cross-Listed Courses

Repeatable Courses

Can this course be repeated for credit?
No

Enrolment Rules

Consent to Add
No consent required

Consent to Drop
No consent required

Prerequisites
No Rules

Corequisites
No Rules

Antirequisites
- Complete all of the following
  - Not completed nor concurrently enrolled in: SYDE780 (Topic 2**: Biomaterials Science**)
  - **Not completed nor concurrently enrolled in:**
    - **Course Not Found**

Course Notes

Fee Statement

Workflow Information

Workflow Path
Committee approvals

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

Admin Only - Proposal

Impact Changes

Requisites in Quest
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Senate Council Meeting Date

Admin Only

Include in Calendar
Graduate

End Date
No Date Chosen

Calendar Activation Date
09/01/2023

Requisite Summary
Antireq: SYDE 780 Topic 2 - Biomaterials Science

Admin Notes

Integration Message

Status (Admin Override)
Active

Quest Course ID (Admin Override)
14500

Offering Number (Admin Override)
1

Graduate Studies
Program Revision Template

Prior to form submission, review the instructions and information regarding major/minor modifications. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering

Programs: 1) Master of Engineering (MEng) in Mechanical and Mechatronics Engineering
2) Master of Engineering (MEng) in Mechanical and Mechatronics Engineering - Co-operative Program
3) Master of Engineering (MEng) in Mechanical and Mechatronics Engineering - Health Technologies - Co-operative Program

Program contact name(s):

Form completed by: Jean-Pierre Hickey

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Removing the Graduate Record Examination (GRE) test from the minimum admission requirements for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America.

Is this a major modification to the program? No

Rationale for change(s):

The requirement to provide a GRE score from applicants that completed their undergraduate degree outside of Canada or the United States of America is increasingly seen as an obstacle to recruitment of qualified international MEng applicants. Many of our peer institutions (Toronto, McGill and others) no longer require GRE score for their graduate studies in Engineering; the GRE requirement is increasingly being dropped at US schools as well. Additionally, the removal of the GRE requirement will align the MEng admission process with the rest of the Faculty of Engineering.

Proposed effective date: Term: Fall Year: 2025

Current Graduate Studies Academic Calendar (GSAC) page (include the link to the web page where the changes are to be made):

https://uwaterloo.ca/academic-calendar/graduate-studies/catalog#/programs?group=Mechanical%20and%20Mechatronics%20Engineering

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Admission requirements: Minimum requirements • The Department of Mechanical and Mechatronics Engineering requires either (i) a	**Admission requirements: Minimum requirements** • The Department of Mechanical and Mechatronics Engineering requires either (i) a

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • ~~Graduate Record Examination (GRE) test scores (requirement only for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America).~~ • English language proficiency (ELP) (if applicable)	75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • English language proficiency (ELP) (if applicable)

How will students currently registered in the program be impacted by these changes?

Current students will not be impacted by the change of admission requirements.

Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/21/25
Department/School approval date (mm/dd/yy): 02/26/25
Graduate Faculty Sub-Committee approval date (mm/dd/yy):
Faculty Council approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

MEng in Systems Design Engineering
Master of Engineering (MEng) in Systems Design Engineering

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Coursework Option: Course Requirements
- Effective Term and Year

Effective Date and Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Winter 2025

Proposal Details

Proposal Type
Change

Academic Unit Approval
12/12/2024

Quality Assurance Designation
Minor Modification

Is there an impact to existing students?
Yes

Impact on Existing Students
Students who are currently enrolled in the program may take advantage of these changes to the extend in which it will help them meet their degree requirements. Students may elect to follow the Calendar which is most advantageous to them.

Is the credential name changing?
No

Graduate Co-operative Requirements
Not Applicable

Change to Learning Outcomes
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Rationale and Background for Change(s)
1) Adding SYDE 770 Topic 39: Deployment of Deep Learning Models to the list of approved electives for our Graduate Specialization in Artificial Intelligence and Machine Learning: SYDE 770 is a new course taught by a new faculty member which is directly applicable to the Artificial Intelligence and Machine Learning Specialization.
2) Updating the course requirements to allow MEng students to take up to two courses from the Faculty of Mathematics as part of their degree requirements: Students in the MEng program could not previously take courses from outside of Engineering as part of their degree requirements. In order to allow greater flexibility in the program requirements and to be more in line with the MASc requirements, the Department wishes to add this degree of flexibility to the program.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Engineering

Academic Unit
Department of Systems Design Engineering

Graduate Field of Study
Systems Design Engineering

Faculty
Faculty of Engineering

Program/Plan Name
Master of Engineering (MEng) in Systems Design Engineering

Graduate Credential Type
Master's

Accelerated Program
Not applicable

Study Options (New)
Coursework

Program Types

Admit Term(s)
Fall
Winter
Spring

Delivery Mode
On-campus

Delivery Mode Information

Length of Program
- Full-time: 4 terms (16 months)
- Part-time: 8 terms (32 months)

Registration Option(s)
Full-time
Part-time

Registration Options Information

Graduate Research Fields

Graduate Specializations
- Artificial Intelligence and Machine Learning
- Biomedical Systems
- Human Factors
- Mechatronics and Physical Systems
- Vision, Image and Signal Processing

Additional Program Information

Admissions

Admission Requirements: Minimum Requirements

- A 4-year Honours Bachelor's degree in engineering. For applicants whose previous degree was completed in Canada, a 75% overall standing in the last two years, or equivalent (at the sole discretion of the University of Waterloo, in all cases), in a four-year Honour's Bachelor's degree in engineering is the minimum requirement for admission to a Master's program.
- Due to the variable nature of international credentials, for applicants whose previous degree was completed outside of Canada, a 75% overall standing in a four-year Honours Bachelor's degree in engineering or equivalent is the minimum requirement for admission.
- Applicants who do not hold a Honours Bachelor's degree in engineering must justify their suitability by demonstrating formal or informal training in engineering through the supplementary information form (SIF), their resume/CV, or other supporting material.
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: a minimum of 1 academic reference. Applicants who complete their degree five or more years before the application date may submit 2 professional references.

Requirements Information

Graduate Degree Requirements

- Students must complete the course requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Coursework Option: Course Requirements

No Rules

Proposed

Coursework Option: Course Requirements

- Students must complete the following 2 core Systems Design Engineering graduate courses:
  - SYDE 600 Systems Theory, Models, Research & Design
  - 1 of:
    - SYDE 660A Systems Design Graduate Workshop 1 - AI and Machine Learning,
    - SYDE 660B Systems Design Graduate Workshop 1 - Biomedical Systems,
    - SYDE 660C Systems Design Graduate Workshop 1 - Human Factors,
    - SYDE 660D Systems Design Graduate Workshop 1 - Mechatronic & Physical Systems,
    - SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image & Signal Processing, or
    - SYDE 660 Systems Design Graduate Workshop 1
- In addition to the 2 core courses, students must complete 6 Engineering graduate courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo satisfying the following criteria:
  - At least 2 Systems Design Engineering courses at the 500, 600 or 700 level.
  - At most 2 courses at the 500 level.
  - At most 2 graduate courses may be taken from the Faculty of Mathematics.
- Students in the MEng in Systems Design Engineering program may also choose to pursue one of the following five Graduate Specializations:
  1. Artificial Intelligence and Machine Learning
  2. Biomedical Systems
  3. Human Factors
  4. Mechatronics and Physical Systems
  5. Vision, Image and Signal Processing
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Systems Design Engineering consist of a set of 4 graduate (0.50 weight) level courses and this set is comprised of a mix of specified and elective courses. Specified courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the five Graduate Specializations are described below.

1. Graduate Specialization in Artificial Intelligence and Machine Learning

- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 522 Machine Intelligence or SYDE 552 Computational Neurosciences
  - SYDE 660A Systems Design Graduate Workshop 1 – AI and Machine Learning
  - SYDE 675 Pattern Recognition
- Elective courses (at least 1 course from the following list):
  - SYDE 662 Systems Design Graduate Workshop 2
  - SYDE 671 Advanced Image Processing
  - SYDE 672 Statistical Image Processing
  - SYDE 673 Video Processing & Analytics
  - SYDE 674 3D Computer Vision & Imaging
  - SYDE 770 Topic 39 Selected Topics in Communication and Information Systems: Deployment of Deep Learning Models

2. Graduate Specialization in Biomedical Systems

- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 660B Systems Design Graduate Workshop 1 – Biomedical Systems
  - At least 2 from the following list:
    - SYDE 544 Biomed Measure & SIP
    - SYDE 684 Materials Biocompatability
    - SYDE 750 Topic 20 Topics in Systems Modelling: Modeling of Biomechanical Systems
    - SYDE 750 Topic 36 Topics in Systems Modelling: Assistive Tech and Rehab Eng
- Elective courses (at least 1 from the following list or an additional course from the Specified course list)
  - SYDE 552 Computational Neurosciences
  - SYDE 556 Simulating Neurobiological Systems
  - SYDE 652 Dynamics of Multibody Systems
  - SYDE 662 Systems Design Graduate Workshop 2
  - SYDE 677 Medical Imaging
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 544 is taken as a Specified course, then SYDE 552 and SYDE 556 cannot be taken to satisfy the Elective course requirement.

3. Graduate Specialization in Human Factors

- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 660C Systems Design Graduate Workshop 1 – Human Factors
  - At least 2 from the following list:
    - SYDE 542 Interface Design or SYDE 543 Cognitive Ergonomics
    - SYDE 642 Cognitive Engineering Methods
    - SYDE 644 Human Factors Testing
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
  - SYDE 533 Conflict Resolution
  - SYDE 662 Systems Design Graduate Workshop 2

- SYDE 740 Advanced Cognitive Ergonomics
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 542 or SYDE 543 is taken as a Specified course, then SYDE 533 cannot be taken to satisfy the Elective course requirement.

4. Graduate Specialization in Mechatronic and Physical Systems
- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 660D Systems Design Graduate Workshop 1 - Mechatronic & Physical Systems
  - At least 2 from the following list:
    - SYDE 553 Advanced Dynamics
    - SYDE 652 Dynamics of Multibody Systems
    - SYDE 655 Optimal Control
    - SYDE 682 Advanced MEMS, Physics, Design & Fabrication
    - SYDE 683 Modelling, Simulation & Design of MEMS
    - SYDE 750 Modelling Continuum Systems
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
  - SYDE 531 Design Opt. under Probabilistic Uncertainty
  - SYDE 631 Time Series Modelling
  - SYDE 661 Model-based robust design
  - SYDE 662 Systems Design Graduate Workshop 2
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 553 is taken as a Specified course, then SYDE 531 cannot be taken to satisfy the Elective course requirement.

5. Graduate Specialization in Vision, Image and Signal Processing
- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image & Signal Processing
  - At least 2 from the following list:
    - SYDE 575 Image Processing
    - SYDE 671 Advanced Image Processing
    - SYDE 677 Medical Imaging
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
  - SYDE 544 Biomed Measure & SIP
  - SYDE 633 Remote Sensing Systems
  - SYDE 662 Systems Design Graduate Workshop 2
  - SYDE 672 Statistical Image Processing
  - SYDE 673 Video Processing & Analytics
  - SYDE 674 3D Computer Vision & Imaging
  - SYDE 675 Pattern Recognition
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 575 is taken as a specified course, then SYDE 544 cannot be taken to satisfy the Elective course requirement.
- All course selections are arranged by the student.
- Note: these requirements are in addition to satisfactory completion of any transitional courses that may be specified at the time of admission.

Existing

Coursework Option: Course Requirements

- Students must complete the following 2 core Systems Design Engineering graduate courses:
  - SYDE 600 Systems Theory, Models, Research & Design
  - 1 of:
    - SYDE 660A Systems Design Graduate Workshop 1 - AI and Machine Learning,
    - SYDE 660B Systems Design Graduate Workshop 1 - Biomedical Systems,
    - SYDE 660C Systems Design Graduate Workshop 1 - Human Factors,
    - SYDE 660D Systems Design Graduate Workshop 1 - Mechatronic & Physical Systems,
    - SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image & Signal Processing, or
    - SYDE 660 Systems Design Graduate Workshop 1
- In addition to the 2 core courses, students must complete 6 Engineering graduate courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo satisfying the following criteria:
  - At least 2 Systems Design Engineering courses at the 500, 600 or 700 level.
  - At most 2 courses at the 500 level.
- Students in the MEng in Systems Design Engineering program may also choose to pursue one of the following five Graduate Specializations:
  1. Artificial Intelligence and Machine Learning
  2. Biomedical Systems
  3. Human Factors
  4. Mechatronics and Physical Systems
  5. Vision, Image and Signal Processing
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Systems Design Engineering consist of a set of 4 graduate (0.50 weight) level courses and this set is comprised of a mix of specified and elective courses. Specified courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the five Graduate Specializations are described below.

1. Graduate Specialization in Artificial Intelligence and Machine Learning
- Students must satisfy the following:
- 3 Specified courses:
  - SYDE 522 Machine Intelligence or SYDE 552 Computational Neurosciences

    - SYDE 660A Systems Design Graduate Workshop 1 – AI and Machine Learning
    - SYDE 675 Pattern Recognition
- Elective courses (at least 1 course from the following list):
    - SYDE 662 Systems Design Graduate Workshop 2
    - SYDE 671 Advanced Image Processing
    - SYDE 672 Statistical Image Processing
    - SYDE 673 Video Processing & Analytics
    - SYDE 674 3D Computer Vision & Imaging

2. Graduate Specialization in Biomedical Systems
- Students must satisfy the following:
- 3 Specified courses:
    - SYDE 660B Systems Design Graduate Workshop 1 – Biomedical Systems
    - At least 2 from the following list:
        - SYDE 544 Biomed Measure & SIP
        - SYDE 684 Materials Biocompatability
        - SYDE 750 Topic 20 Topics in Systems Modelling: Modeling of Biomechanical Systems
        - SYDE 750 Topic 36 Topics in Systems Modelling: Assistive Tech and Rehab Eng
- Elective courses (at least 1 from the following list or an additional course from the Specified course list)
    - SYDE 552 Computational Neurosciences
    - SYDE 556 Simulating Neurobiological Systems
    - SYDE 652 Dynamics of Multibody Systems
    - SYDE 662 Systems Design Graduate Workshop 2
    - SYDE 677 Medical Imaging
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 544 is taken as a Specified course, then SYDE 552 and SYDE 556 cannot be taken to satisfy the Elective course requirement.

3. Graduate Specialization in Human Factors
- Students must satisfy the following:
- 3 Specified courses:
    - SYDE 660C Systems Design Graduate Workshop 1 – Human Factors
    - At least 2 from the following list:
        - SYDE 542 Interface Design or SYDE 543 Cognitive Ergonomics
        - SYDE 642 Cognitive Engineering Methods
        - SYDE 644 Human Factors Testing
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
    - SYDE 533 Conflict Resolution
    - SYDE 662 Systems Design Graduate Workshop 2
    - SYDE 740 Advanced Cognitive Ergonomics
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 542 or SYDE 543 is taken as a Specified course, then SYDE 533 cannot be taken to satisfy the Elective course requirement.

4. Graduate Specialization in Mechatronic and Physical Systems
- Students must satisfy the following:
- 3 Specified courses:
    - SYDE 660D Systems Design Graduate Workshop 1 - Mechatronic & Physical Systems
    - At least 2 from the following list:
        - SYDE 553 Advanced Dynamics
        - SYDE 652 Dynamics of Multibody Systems
        - SYDE 655 Optimal Control
        - SYDE 682 Advanced MEMS, Physics, Design & Fabrication
        - SYDE 683 Modelling, Simulation & Design of MEMS
        - SYDE 750 Modelling Continuum Systems
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
    - SYDE 531 Design Opt. under Probabilistic Uncertainty
    - SYDE 631 Time Series Modelling
    - SYDE 661 Model-based robust design
    - SYDE 662 Systems Design Graduate Workshop 2
- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 553 is taken as a Specified course, then SYDE 531 cannot be taken to satisfy the Elective course requirement.

5. Graduate Specialization in Vision, Image and Signal Processing
- Students must satisfy the following:
- 3 Specified courses:
    - SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image & Signal Processing
    - At least 2 from the following list:
        - SYDE 575 Image Processing
        - SYDE 671 Advanced Image Processing
        - SYDE 677 Medical Imaging
- Elective courses (at least 1 from the following list or an additional course from the Specified course list):
    - SYDE 544 Biomed Measure & SIP
    - SYDE 633 Remote Sensing Systems
    - SYDE 662 Systems Design Graduate Workshop 2
    - SYDE 672 Statistical Image Processing
    - SYDE 673 Video Processing & Analytics
    - SYDE 674 3D Computer Vision & Imaging
    - SYDE 675 Pattern Recognition

- Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 575 is taken as a specified course, then SYDE 544 cannot be taken to satisfy the Elective course requirement.
- All course selections are arranged by the student.
- Note: these requirements are in addition to satisfactory completion of any transitional courses that may be specified at the time of admission.

Coursework Option: Milestone Requirements

Notes

- Systems Design Engineering website
- Master of Engineering (MEng) in Systems Design Engineering future students program page

Workflow Information

Workflow Path
Committee approvals

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Senate Workflow
--

Dependencies

Dependent Courses and Programs/Plans

PREREQUISITES

- BE 605 - Project Management — View Courses
- BE 603 - Operations and Supply Chain Management — View Courses
- BE 602 - Data Analysis and Management — View Courses
- BE 606 - Entrepreneurship and Innovation — View Courses
- BE 601 - Introduction to Financial and Managerial Accounting — View Courses
- BE 604 - Marketing Management — View Courses
- BE 600 - Management and Leadership — View Courses
- BE 610 - Special Topics in Business and Entrepreneurship — View Courses
- SYDE 600 - Systems Theory, Models, Research & Design — View Courses

Admin Only - Proposal

Impact Changes

Senate Council Meeting Date

Senate Meeting Date

Admin Only

Include in Calendar
Graduate

End Date
No Date Chosen

Calendar Activation Date
12/20/2024

CM Program Code
MEng in Systems Design Engineering

Description

Status (Admin Override)
Active

Admin Notes

Graduate Plan Code
SYDEMENG

Study Options
Coursework

Special Notice

PhD in Biomedical Engineering
Doctor of Philosophy (PhD) in Biomedical Engineering

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Graduate Course Requirements
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Spring 2025

Proposal Details

Proposal Type
Change

Academic Unit Approval
02/28/2025

Quality Assurance Designation
Minor Modification

Is there an impact to existing students?
Yes

Impact on Existing Students
Currently there are no registered students in the program. However, should students register in the program for spring 2025, they will also be able to follow the new program regulations that take effect in fall 2025.

Is the credential name changing?
No

Graduate Co-operative Requirements
Not Applicable

Change to Learning Outcomes
No

Rationale and Background for Change(s)
1) Revise course requirements for all PhD students (with a Master's degree) to be required to take 4 courses: There are master's degrees that can be considered equivalent to a Biomedical Engineering master's degree. The master's degree a student has should also be dependent on the research they will be conducting as a PhD student. Also, the core course PhD students will be required to take provides in depth knowledge for these students to be successful in their program. Therefore, we want all PhD students (with a Master's degree) to be required to take 4 courses. Currently, students with a biomedical engineering master's degree are required to take 4 courses and every other student with another master's degree is required to take 6 courses. For students who need to take more courses (which will be decided by the student's supervisor(s) and director), we are requesting to add wording that some students may be required to take additional courses depending on their background.

2) Remove wording that one course shall be taken from outside the Faculty of Engineering: We are also requesting to remove wording that states "one course shall be taken from outside the Faculty of Engineering". This is not necessary as the calendar already states that courses are to be approved by the supervisor(s) which ensures appropriate course selection for students.

3) Add BME 611, BME 641, and BME 651 to field-specific course requirements list: We are also requesting to add three courses to the field-specific course requirement. These courses directly relate to one of our five fields, and therefore students who take these courses should have them count towards their field-specific course requirement.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Graduate Field of Study
Biomedical Engineering

Faculty
Faculty of Engineering

Program/Plan Name
Doctor of Philosophy (PhD) in Biomedical Engineering

Graduate Credential Type
PhD

Accelerated Program
Not applicable

Program Types

Admit Term(s)
Fall
Winter
Spring

Delivery Mode
On-campus

Delivery Mode Information

Length of Program
- Students are required to complete the program in accordance with the University program time limits.

Registration Option(s)
Full-time

Registration Options Information

Graduate Research Fields
- Biomaterials, Tissue Engineering, and Drug Delivery
- Biomechanics and Rehabilitation
- Biomedical Signals and Devices
- Biomedical Imaging Technology
- Biomedical Informatics

Graduate Specializations

Additional Program Information

Admissions

Admission Requirements: Minimum Requirements

- PhD (regular entry) applicants who completed a research thesis-based master's degree (or equivalent) in engineering, applied science, or science from a recognized institution with at least an overall 80% average and documented evidence of potential to excel in PhD studies and research.
- PhD (direct from Honours Biomedical Engineering (BME) undergraduate entry) applicants require a minimum overall average of 80% in a BME program at the undergraduate level and clear evidence of excellent potential to excel in PhD studies and research. Substantial research experience is expected.
- Applicants who are deemed by the graduate coordinator, BME graduate program director, Admissions Committee or intended advisor to have an inadequate depth of technical BME background may be directed to take additional foundational courses, to be specified at the time of admission.
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 3
- Type of references: 2 from academic sources that are able to comment upon academic preparation and research ability.

Requirements Information

Graduate Degree Requirements

- Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Graduate Course Requirements

No Rules

Proposed

Graduate Course Requirements

- Students are required to successfully complete 4 graduate-level courses (with unit weights of 0.50 each), including 1 core biomedical engineering course (BME 601, BME 602, or BME 603), 1 field-specific course from the list below, and 2 elective courses.
  - The field specific course and the chosen electives must be approved by the supervisor(s).
  - All courses must be completed by the end of term 4.
  - Further courses may be required by the supervisor(s) in consultation with the Director of Biomedical Engineering Graduate Programs depending on the student's educational background.
  - Students who have completed the MASc program in BME at Waterloo may apply and continue to the doctoral program. In this situation, students will have already completed the core course requirements (one of BME 601, BME 602, or BME 603), a field-specific course and two electives as part of their master's degree requirements. To satisfy the PhD program requirements, these students must complete a total of four courses including a) one core course requirement (one of BME 601, BME 602 or BME 603 that was not completed as part of the MASc in BME program); b) two additional electives; c) an additional field-specific course if they have switched fields between MASc and PhD.
- Students admitted directly to the PhD program who possess an honour's undergraduate degree in biomedical engineering are required to complete a minimum of 7 courses (with 0.50 credits each), including 2 core BME courses (BME 601, BME 602, BME 603), 1 field-specific course from the list below, and 4 elective courses.
  - The field specific course and the chosen electives must be approved by the supervisor(s).
  - All courses must be completed by the end of term 5.
- Student must select their field-specific course(s) from the following list:
  - Biomaterials, Tissue Engineering and Drug Delivery
    - BIOL 636 Advanced Immunology
    - BME 611 Materials Biocompatibility
    - CHE 601 Theory and Application of Transport Phenomena
    - CHE 602 Chemical Reactor Analysis
    - CHE 612 Interfacial Phenomena
    - CHE 620 Applied Engineering Mathematics
    - CHE 640 Principles of Polymer Science
    - CHE 660 Principles of Biochemical Engineering
    - CHE 663 Bioseparations
    - CHE 760 Special Topics in Biochemical Engineering
    - ECE 601 Foundations of Biology in Engineering
    - KIN 657 Human Neuroanatomy
    - PHARM 609 Advanced Pharmacokinetics
    - PHARM 610 Topics in Drug Development
    - PHARM 617 Formulations
    - SYDE 684 Materials Biocompatibility
  - Biomechanics and Rehabilitation
    - AMATH 663 Fluid Mechanics
    - BME 550 Sports Engineering
    - BME 551 Biomechanics of Human Movement
    - BME 588 Special Topics in Biomechanics Topic 1: Mechanics of Biomaterials and Tissues
    - KIN 601 Skeletal Muscle Physiology: Structure & Function
    - KIN 602 Respiratory and Cardiovascular Physiology
    - KIN 603 Cardiac and Vascular Smooth Muscle Physiology
    - KIN 611 Biomechanics of Human Motion
    - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
    - KIN 620 Ergonomic Aspects of Occupational Musculoskeletal Injuries
    - ME 621 Applied Finite Element Methods
    - ME 662 Advanced Fluid Mechanics
    - ME 663 Computational Fluid Dynamics
    - ME 720 Special Topics in Solid Mechanics Topic 5: Impact Biomechanics
    - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
    - ME 780 Special Topics in Mechatronics Topic 37: Human Movement Neuromechanics
    - PHYS 752 Molecular Biophysics
    - SYDE 644 Human Factors Testing
  - Biomedical Signals and Devices
    - ECE 730 Special Topics in Solid State Devices Topic 34: Biosensing – Fundamentals and Applications
    - ECE 770 Special Topics in Antenna and Microwave Theory Topic 4: Computational Methods for Engineering Electromagnetics
    - KIN 653 Human Neuroscience Theory
    - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
    - ME 739 Manufacturing Processes Topics Topic 3: Materials for Nano & Microelectromechanical Systems
    - ME 739 Manufacturing Processes Topics Topic 15: Additive Manufacturing Design
    - ME 765 Special Topics in Fluid Mechanics Topic 22: Microfluidic and MEMS Systems and Applications
    - ME 780 Special Topics in Mechatronics Topic 32: Neural and Rehabilitation Engineering
    - NANO 604 Nanomechanics and Molecular Dynamics Simulations

        - SYDE 750 Topics in Systems Modelling Topic 38: Social Robotics
    - Biomedical Imaging Technology
        - BME 641 Medical Imaging
        - ECE 607 Fundamentals of Ultrasonics
        - ECE 613 Image Processing and Visual Communication
        - ECE 675 Radiation & Propagation of Electromagnetic Fields
        - ME 720 Special Topics in Solid Mechanics Topic 20: Acoustics
        - PHYS 751 Clinical Applications of Physics in Medicine
        - SYDE 671 Advanced Image Processing
        - SYDE 672 Statistical Image Processing
        - SYDE 675 Pattern Recognition
        - SYDE 677 Medical Imaging
        - SYDE 780 Selected Topics in Engineering Sciences Topic 13: Biomedical Optics
    - Biomedical Informatics
        - AMATH 882 Mathematical Cell Biology
        - BIOL 614 Applied Bioinformatics and Genomics
        - BME 651 Big Data Analysis: Health and Biomedical Engineering
        - HLTH 612 Data Structures and Standards in Health Informatics
        - HLTH 615 Requirements Specification and Analysis in Health Systems
        - HLTH 616 Decision Making and Systems Thinking in Health Informatics
        - HLTH 719 Advanced Research Methods in Health Data Science
        - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
    - BME and health electives (general electives that include topics in more than one research fields)
        - ECE 603 Statistical Signal Processing
        - ECE 608 Quantitative Methods in Biomedical Engineering
        - KIN 601 Skeletal Muscle Physiology: Structure & Function
        - KIN 606 Molecular Basis of Disease
        - KIN 607 Integrative Energy Metabolism in Health and Disease
        - KIN 608 Introduction to Genetics for the Biosciences
        - KIN 612 Instrumentation and Signal Processing in Biophysical Research
        - KIN 646 Physiological and Biochemical Analysis of Nutrition and Health
        - KIN 653 Human Neuroscience Theory
        - KIN 654 Instrumentation in Neuroscience Research
        - SYDE 642 Cognitive Engineering Methods
        - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 37/32: Biology and Computation
        - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 39/33: Embodied Intelligence
    - In every case, a graduate course program is established by the supervisor(s) in consultation with the student and is subject to the approval of the Director of the BME Graduate Program. Candidates may also be required to take additional courses as a result of a comprehensive examination. Students pursuing one of the program's Graduate Research Fields should inform their supervisor(s) of their chosen field(s) to ensure appropriate course selection.
    - The Faculty of Engineering requires that no more than one-half of the courses used for credit towards a graduate degree may be taught by the candidate's supervisor(s). In the case of co-supervision in small research groups, it may be necessary to relax this rule, but the student's file must contain a statement of formal approval from the BME graduate program director and endorsement from the Associate Dean for Graduate Studies and Postdoctoral Affairs in the Faculty of Engineering.

Existing

Graduate Course Requirements

- Students possessing a recent master's degree in biomedical engineering are required to successfully complete 4 graduate-level courses (with unit weights of 0.50 each), including 1 core biomedical engineering course (BME 601, BME 602, or BME 603), 1 field-specific course from the list below, and 2 elective courses.
    - The field specific course and the chosen electives must be approved by the supervisor(s).
    - One course shall be taken from outside the Faculty of Engineering.
    - All courses must be completed by the end of term 4.
    - Students who have completed the MASc program in BME at Waterloo may apply and continue to the doctoral program. In this situation, students will have already completed the core course requirements (one of BME 601, BME 602, or BME 603), a field-specific course and two electives as part of their master's degree requirements. To satisfy the PhD program requirements, these students must complete a total of four courses including a) one core course requirement (one of BME 601, BME 602 or BME 603 that was not completed as part of the MASc in BME program); b) two additional electives; c) an additional field-specific course if they have switched fields between MASc and PhD.
- Students admitted to the PhD program who possess a master's degree in a discipline outside of biomedical engineering (or equivalent) are required to successfully complete a minimum of 6 graduate-level courses (with a credit weight of 0.50 each) including 1 core biomedical engineering course (BME 601, BME 602, or BME 603), 1 field-specific course from the list below, and 4 elective courses.
    - The field specific course and the chosen electives must be approved by the supervisor(s).
    - One course shall be taken from outside the Faculty of Engineering.
    - All courses must be completed by the end of term 5.
- Students admitted directly to the PhD program who possess an honour's undergraduate degree in biomedical engineering are required to complete a minimum of 7 courses (with 0.50 credits each), including 2 core BME courses (BME 601, BME 602, BME 603), 1 field-specific course from the list below, and 4 elective courses.
    - The field specific course and the chosen electives must be approved by the supervisor(s).
    - One course shall be taken from outside the Faculty of Engineering.

    - All courses must be completed by the end of term 5.
- Student must select their field-specific course(s) from the following list:
    - Biomaterials, Tissue Engineering and Drug Delivery
        - BIOL 636 Advanced Immunology
        - CHE 601 Theory and Application of Transport Phenomena
        - CHE 602 Chemical Reactor Analysis
        - CHE 612 Interfacial Phenomena
        - CHE 620 Applied Engineering Mathematics
        - CHE 640 Principles of Polymer Science
        - CHE 660 Principles of Biochemical Engineering
        - CHE 663 Bioseparations
        - CHE 760 Special Topics in Biochemical Engineering
        - ECE 601 Foundations of Biology in Engineering
        - KIN 657 Human Neuroanatomy
        - PHARM 609 Advanced Pharmacokinetics
        - PHARM 610 Topics in Drug Development
        - PHARM 617 Formulations
        - SYDE 684 Materials Biocompatibility
    - Biomechanics and Rehabilitation
        - AMATH 663 Fluid Mechanics
        - BME 550 Sports Engineering
        - BME 551 Biomechanics of Human Movement
        - BME 588 Special Topics in Biomechanics Topic 1: Mechanics of Biomaterials and Tissues
        - KIN 601 Skeletal Muscle Physiology: Structure & Function
        - KIN 602 Respiratory and Cardiovascular Physiology
        - KIN 603 Cardiac and Vascular Smooth Muscle Physiology
        - KIN 611 Biomechanics of Human Motion
        - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
        - KIN 620 Ergonomic Aspects of Occupational Musculoskeletal Injuries
        - ME 621 Applied Finite Element Methods
        - ME 662 Advanced Fluid Mechanics
        - ME 663 Computational Fluid Dynamics
        - ME 720 Special Topics in Solid Mechanics Topic 5: Impact Biomechanics
        - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
        - ME 780 Special Topics in Mechatronics Topic 37: Human Movement Neuromechanics
        - PHYS 752 Molecular Biophysics
        - SYDE 644 Human Factors Testing
    - Biomedical Signals and Devices
        - ECE 730 Special Topics in Solid State Devices Topic 34: Biosensing – Fundamentals and Applications
        - ECE 770 Special Topics in Antenna and Microwave Theory Topic 4: Computational Methods for Engineering Electromagnetics
        - KIN 653 Human Neuroscience Theory
        - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
        - ME 739 Manufacturing Processes Topics Topic 3: Materials for Nano & Microelectromechanical Systems
        - ME 739 Manufacturing Processes Topics Topic 15: Additive Manufacturing Design
        - ME 765 Special Topics in Fluid Mechanics Topic 22: Microfluidic and MEMS Systems and Applications
        - ME 780 Special Topics in Mechatronics Topic 32: Neural and Rehabilitation Engineering
        - NANO 604 Nanomechanics and Molecular Dynamics Simulations
        - SYDE 750 Topics in Systems Modelling Topic 38: Social Robotics
    - Biomedical Imaging Technology
        - ECE 607 Fundamentals of Ultrasonics
        - ECE 613 Image Processing and Visual Communication
        - ECE 675 Radiation & Propagation of Electromagnetic Fields
        - ME 720 Special Topics in Solid Mechanics Topic 20: Acoustics
        - PHYS 751 Clinical Applications of Physics in Medicine
        - SYDE 671 Advanced Image Processing
        - SYDE 672 Statistical Image Processing
        - SYDE 675 Pattern Recognition
        - SYDE 677 Medical Imaging
        - SYDE 780 Selected Topics in Engineering Sciences Topic 13: Biomedical Optics
    - Biomedical Informatics
        - AMATH 882 Mathematical Cell Biology
        - BIOL 614 Applied Bioinformatics and Genomics
        - HLTH 612 Data Structures and Standards in Health Informatics
        - HLTH 615 Requirements Specification and Analysis in Health Systems
        - HLTH 616 Decision Making and Systems Thinking in Health Informatics
        - HLTH 719 Advanced Research Methods in Health Data Science

        - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
    - BME and health electives (general electives that include topics in more than one research fields)
        - ECE 603 Statistical Signal Processing
        - ECE 608 Quantitative Methods in Biomedical Engineering
        - KIN 601 Skeletal Muscle Physiology: Structure & Function
        - KIN 606 Molecular Basis of Disease
        - KIN 607 Integrative Energy Metabolism in Health and Disease
        - KIN 608 Introduction to Genetics for the Biosciences
        - KIN 612 Instrumentation and Signal Processing in Biophysical Research
        - KIN 646 Physiological and Biochemical Analysis of Nutrition and Health
        - KIN 653 Human Neuroscience Theory
        - KIN 654 Instrumentation in Neuroscience Research
        - SYDE 642 Cognitive Engineering Methods
        - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 37/32: Biology and Computation
        - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 39/33: Embodied Intelligence
    - In every case, a graduate course program is established by the supervisor(s) in consultation with the student and is subject to the approval of the Director of the BME Graduate Program. Candidates may also be required to take additional courses as a result of a comprehensive examination. Students pursuing one of the program's Graduate Research Fields should inform their supervisor(s) of their chosen field(s) to ensure appropriate course selection.
    - The Faculty of Engineering requires that no more than one-half of the courses used for credit towards a graduate degree may be taught by the candidate's supervisor(s). In the case of co-supervision in small research groups, it may be necessary to relax this rule, but the student's file must contain a statement of formal approval from the BME graduate program director and endorsement from the Associate Dean for Graduate Studies and Postdoctoral Affairs in the Faculty of Engineering.

Milestone Requirements

Professional Attributes and Competence Enhancement (PACE) Module

- The PACE module milestone includes the following three components: Seminar series, PACE days, and Annual BME research day. The requirements for the three components are outlined below:
- Seminar series including presenting a research seminar:
    - Biweekly seminar series with students and internal and external BME speakers (1.5-hour duration). Guest speakers will also be invited to speak at the seminar series. The topics may be related to BME research, academic integrity, or professional development.
    - Each student must attend a minimum of five seminars per term, except for their final term. It is the student's responsibility to submit their "Seminar Attendance Certificates" attached to their term activity report. BME records should show that the number of seminars a student has attended is at least four times the number of terms the student has been enrolled as a full-time student in the program.
    - Each student will be required to present a research seminar by the end of their final term and as part of the PACE module milestones. BME will contact seminar candidates with scheduling information after they have passed their comprehensive exam (Parts I and II).
- PACE days:
    - Students are required to attend and participate in 2 PACE days at the beginning of terms 1, 2, 3, 4 and 5. PACE days are dedicated to students' professional development and the topics vary each term.
- Annual BME Research Day – once per year
    - Students are required to attend and present at the Annual BME Research Day. The annual event gives students an opportunity to showcase their progress and research findings while building community among BME graduate students. Students are required to submit an abstract and give either an oral or poster presentation.

PhD Comprehensive Examination I and Comprehensive Examination II

- Students are required to meet the University-level PhD Comprehensive Examination minimum requirements outlined in the "Minimum requirements for the PhD degree" section of the Graduate Studies Academic Calendar (GSAC), with certain noted differences that are specific to the Faculty of Engineering Comprehensive Examination minimum requirements:
    - Comprehensive examination purpose: Consistent with University-level minimum requirements.
    - Timing: Students must follow the Faculty of Engineering completion timelines.
    - Committee: Students must follow the Faculty of Engineering committee composition guidelines which differ from the University-level minimum requirements in both number of committee members and committee makeup.
    - Who Chairs an examination: Students must follow the Faculty of Engineering Chair guidelines whereby the Chair is normally selected from outside of the student's home department.
    - Format / Content: Consistent with University-level minimum requirements but with additional information provided in the Faculty of Engineering Comprehensive Examination minimum requirements.
    - Academic integrity: Consistent with University-level minimum requirements.
- In addition to the University-level and Faculty-level PhD Comprehensive Examination minimum requirements, PhD students in the Biomedical Engineering graduate program are also required to meet the following requirements:
    - Students must successfully complete (pass) the Comprehensive Background Examination (Comprehensive Exam I (Background)) and the Comprehensive Proposal Examination (Comprehensive Exam II (Proposal) which are conducted by the Department for each candidate.
    - The first exam, the Comprehensive Background Examination, will be held before the end of the third term (fourth term if transferring from an incomplete MASc). The main objective of this examination is to satisfy the Department that the candidate has a broad knowledge of their field and a thorough technical background to pursue their research; the candidate will be questioned on their background preparation.
    - The second exam, the Comprehensive Proposal Examination, will be held no later than the student's sixth term and only after the Background Comprehensive Examination has been successfully completed. The main objective of this examination is to examine and approve the written thesis proposal.
    - The result of these examinations is the identification of an Advisory Committee which has examined and approved the candidate's background and thesis proposal and is willing to assist the supervisor with the subsequent research program.
    - Students who do not complete either Comprehensive Examination by the stated deadline, or fail either exam on their second attempt, will be required to withdraw from the program.
    - It is the supervisor's responsibility to assemble the advisory committee.

PhD Thesis

- Students may choose to pursue one (1) of the following Graduate Research Fields:
  - Biomaterials, Tissue Engineering, and Drug Delivery
  - Biomechanics and Rehabilitation
  - Biomedical Signals and Devices
  - Biomedical Imaging Technology
  - Biomedical Informatics
- Candidates are expected to attend annual meetings with their Advisory Committee and complete term reports to provide updates on their progress.
- A Graduate Research Field is a university credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research concentrated in the area of the Graduate Research Field. The BME graduate program, represented by the student's supervisor and examining committee, must assess whether a student's completed research warrants the field designation at the time of degree completion.
- Candidates are expected to maintain continuous registration until the thesis is submitted to Graduate Studies and Postdoctoral Affairs. Under exceptional circumstances, inactive terms or a leave of absence may be requested for a prior specified period with program approval. The role of a supervisor is to assist a candidate in establishing a research problem with an appropriate scope, to suggest alternative general approaches to the solution of a problem and to provide general advice on the structure and content of a thesis. It is imperative that the engineering code of ethics be strictly observed in the supervisor-candidate relationship.
- The PhD degree in the Faculty of Engineering is awarded to a candidate who has successfully completed a program of advanced study and conducted original research. The program of research and its findings must be presented in the form of a thesis and submitted to the University for public examination prior to its oral defense.
- The writer of a thesis must demonstrate a critical awareness and understanding of the literature in the research field, exhibit a capability of defining original and useful research problems and a capability of independent thought in solving a research problem. An ability to communicate research results verbally and in writing must be shown. The University of Waterloo allows students to submit theses in English or in French, the latter being governed by certain important constraints. The principles governing the submission of theses in French are specified in the Graduate Studies Academic Calendar. The oral examination of a thesis will assess the ability of a candidate to communicate orally the results of the research and to defend the contents of the thesis.
- Originality in a thesis may be reflected in a number of ways. A candidate may have posed and solved an important new problem or have formulated an existing problem in a novel and useful way. A candidate may offer new and significant insights into problems examined previously by other researchers. Replications of previous investigations may be acceptable if, and only if, they incorporate [significantly new] elements in the design or execution of an experiment.
- Objective criteria describing what is meant by a significant contribution to knowledge are difficult to specify. One way of gauging a candidate's contribution is to consider the extent to which parts of the thesis might be published in peer-reviewed technical journals with an international stature or as a monograph by an acceptable publisher. The ultimate test of the acceptability of a thesis is the ability of a candidate to satisfy, through an oral examination, to a university-appointed committee of research specialists in the general field of study, that a significant research contribution has been made and communicated adequately.

Notes ⓘ

Workflow Information

Workflow Path ⓘ	Faculty/AFIW Path(s) for Workflow ⓘ	Senate Workflow
Committee approvals	Faculty of Engineering	--

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

Admin Only - Proposal

Impact Changes

Senate Council Meeting Date

Senate Meeting Date

Admin Only

Include in Calendar	End Date	Calendar Activation Date
Graduate	No Date Chosen	04/29/2025

CM Program Code

PhD in Biomedical Engineering

Description

Status (Admin Override)

Active

Proposed

Admin Notes

Existing

Admin Notes

Editorial update to remove the "Special notice" since the program has been approved by the Ministry of Colleges and Universities.

Graduate Plan Code

BMED

Study Options

Thesis

Special Notice

MASc in Biomedical Engineering
Master of Applied Science (MASc) in Biomedical Engineering

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SGRC, Senate Graduate and Research Council (SGRC) expand
Waiting for Approval | Approval Delegate(s)

Mike Grivicic
Tim Weber-Kraljevski
Diana Goncalves
Melanie Figueiredo
Ashley Day

Changes

- Thesis Option: Course Requirements
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career
Graduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Spring 2025

Proposal Details

Proposal Type
Change

Academic Unit Approval
02/28/2025

Quality Assurance Designation
Minor Modification

Is there an impact to existing students?
Yes

Impact on Existing Students
Currently there are no registered students in the program. However, should students register in the program for spring 2025, they will also be able to follow the new program regulations that take effect in fall 2025.

Is the credential name changing?
No

Graduate Co-operative Requirements
Not Applicable

Change to Learning Outcomes
No

Rationale and Background for Change(s)
1) Remove wording that one course shall be taken from outside the Faculty of Engineering: We are requesting to remove wording that states “one course shall be taken from outside the Faculty of Engineering”. This is not necessary as the calendar already states that courses are to be approved by the supervisor(s) which ensures appropriate course selection for students.

2) Add BME 611, BME 641, and BME 651 to field-specific course requirements list: We are also requesting to add three courses to the field-specific course requirement. These courses directly relate to one of our five fields, and therefore students who take these courses should have them count towards their field-specific course requirement.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Graduate Field of Study
Biomedical Engineering

Faculty
Faculty of Engineering

Program/Plan Name
Master of Applied Science (MASc) in Biomedical Engineering

Graduate Credential Type
Master's

Accelerated Program
Not applicable

Study Options (New)
Thesis

Program Types

Admit Term(s)
Fall
Winter
Spring

Delivery Mode
On-campus

Delivery Mode Information

Length of Program
- Students are required to complete the program in accordance with the University program time limits.

Registration Option(s)
Full-time

Registration Options Information

Graduate Research Fields
- Biomaterials, Tissue Engineering, and Drug Delivery
- Biomechanics and Rehabilitation
- Biomedical Signals and Devices
- Biomedical Imaging Technology
- Biomedical Informatics

Graduate Specializations

Additional Program Information

Admissions

Admission Requirements: Minimum Requirements

- MASc applicants must have completed a bachelor's degree (or equivalent) in any field of engineering or a related science discipline at a recognized institution with a minimum 80% overall average.
- Applicants who are deemed by the graduate coordinator, Biomedical Engineering (BME) graduate program director, Admissions Committee or intended advisor to have an inadequate depth of technical BME background may be directed to take additional foundational courses, to be specified at the time of admission.
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: Academic. Applicants who completed their degree five or more years before the application date may submit 1 academic and 1 professional reference.

Requirements Information

Graduate Degree Requirements

- Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Thesis Option: Course Requirements

No Rules

Proposed

Thesis Option: Course Requirements

- Students must complete the following 4 graduate level courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo:
  - 1 of the following Biomedical Engineering core courses:
    - BME 601 Physiological Systems and Biomedical Design
    - BME 602 Foundations in Biomechanical Engineering
    - BME 603 Engineering Analysis of Living Cells
  - 1 of the following field-specific courses:
    - Biomaterials, Tissue Engineering and Drug Delivery
      - BIOL 636 Advanced Immunology
      - BME 611 Materials Biocompatibility
      - CHE 601 Theory and Application of Transport Phenomena
      - CHE 602 Chemical Reactor Analysis
      - CHE 612 Interfacial Phenomena
      - CHE 620 Applied Engineering Mathematics
      - CHE 640 Principles of Polymer Science
      - CHE 660 Principles of Biochemical Engineering
      - CHE 663 Bioseparations
      - CHE 760 Special Topics in Biochemical Engineering
      - ECE 601 Foundations of Biology in Engineering
      - KIN 657 Human Neuroanatomy
      - PHARM 609 Advanced Pharmacokinetics
      - PHARM 610 Topics in Drug Development
      - PHARM 617 Formulations
      - SYDE 684 Materials Biocompatibility
    - Biomechanics and Rehabilitation
      - AMATH 663 Fluid Mechanics
      - BME 550 Sports Engineering
      - BME 551 Biomechanics of Human Movement
      - BME 588 Special Topics in Biomechanics Topic 1: Mechanics of Biomaterials and Tissues
      - KIN 601 Skeletal Muscle Physiology: Structure & Function
      - KIN 602 Respiratory and Cardiovascular Physiology
      - KIN 603 Cardiac and Vascular Smooth Muscle Physiology
      - KIN 611 Biomechanics of Human Motion
      - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
      - KIN 620 Ergonomic Aspects of Occupational Musculoskeletal Injuries
      - ME 621 Applied Finite Element Methods
      - ME 662 Advanced Fluid Mechanics
      - ME 663 Computational Fluid Dynamics
      - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
      - ME 720 Special Topics in Solid Mechanics Topic 5: Impact Biomechanics
      - ME 780 Special Topics in Mechatronics Topic 37: Human Movement Neuromechanics
      - PHYS 752 Molecular Biophysics
      - SYDE 644 Human Factors Testing
    - Biomedical Signals and Devices
      - ECE 730 Special Topics in Solid State Devices Topic 34: Biosensing – Fundamentals and Applications
      - ECE 770 Special Topics in Antenna and Microwave Theory Topic 4: Computational Methods for Engineering Electromagnetics
      - KIN 653 Human Neuroscience Theory
      - ME 720 Special Topics in Solid Mechanics Topic 4: Mechanics of Medical Devices
      - ME 739 Manufacturing Processes Topics Topic 3: Materials for Nano & Microelectromechanical Systems
      - ME 739 Manufacturing Processes Topics Topic 15: Additive Manufacturing Design
      - ME 765 Special Topics in Fluid Mechanics Topic 22: Microfluidic and MEMS Systems and Applications
      - ME 780 Special Topics in Mechatronics Topic 32: Neural and Rehabilitation Engineering
      - NANO 604 Nanomechanics and Molecular Dynamics Simulations
      - SYDE 750 Topics in Systems Modelling Topic 38: Social Robotics
    - Biomedical Imaging Technology
      - BME 641 Medical Imaging
      - ECE 607 Fundamentals of Ultrasonics
      - ECE 613 Image Processing and Visual Communication
      - ECE 675 Radiation & Propagation of Electromagnetic Fields
      - ME 720 Special Topics in Solid Mechanics Topic 20: Acoustics
      - PHYS 751 Clinical Applications of Physics in Medicine
      - SYDE 671 Advanced Image Processing
      - SYDE 672 Statistical Image Processing
      - SYDE 675 Pattern Recognition
      - SYDE 677 Medical Imaging
      - SYDE 780 Selected Topics in Engineering Sciences Topic 13: Biomedical Optics
    - Biomedical Informatics
      - AMATH 882 Mathematical Cell Biology
      - BIOL 614 Applied Bioinformatics and Genomics
      - BME 651 Big Data Analysis: Health and Biomedical Engineering
      - HLTH 612 Data Structures and Standards in Health Informatics

            - HLTH 615 Requirements Specification and Analysis in Health Systems
            - HLTH 616 Decision Making and Systems Thinking in Health Informatics
            - HLTH 719 Advanced Research Methods in Health Data Science
            - KIN 613 Modern Methods in Biomechanical Modeling, Kinematics, and Kinetics
        - BME and health electives (general electives that include topics in more than one research fields)
            - ECE 603 Statistical Signal Processing
            - ECE 608 Quantitative Methods in Biomedical Engineering
            - KIN 601 Skeletal Muscle Physiology: Structure & Function
            - KIN 606 Molecular Basis of Disease
            - KIN 607 Integrative Energy Metabolism in Health and Disease
            - KIN 608 Introduction to Genetics for the Biosciences
            - KIN 612 Instrumentation and Signal Processing in Biophysical Research
            - KIN 646 Physiological and Biochemical Analysis of Nutrition and Health
            - KIN 653 Human Neuroscience Theory
            - KIN 654 Instrumentation in Neuroscience Research
            - SYDE 642 Cognitive Engineering Methods
            - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 37/32: Biology and Computation
            - SYDE/ECE 750 Topics in Systems Modelling/Special Topics in Computer Software Topic 39/33: Embodied Intelligence
    - 2 elective courses
- All courses must be completed by the end of term 4.
- All course selections are arranged by the supervisor(s) in consultation with the student and are subject to the approval of the Director or Associate Director, BME graduate program. Students pursuing one the program's Graduate Research Fields, should inform their supervisor(s) of their chosen field(s) to ensure appropriate course selection.
- Note: these requirements are in addition to satisfactory completion of any transitional courses that may be specified at the time of admission.
- Note: The Faculty of Engineering requires that no more than one-half of the courses used for credit toward a graduate degree may be taught by a candidate's supervisor(s). In the case of co-supervision in small research groups, it may be necessary to relax this rule; however, the student's file must contain a statement of formal approval from the BME graduate program director and endorsement from the Associate Dean for Graduate Studies and Postdoctoral Affairs in the Faculty of Engineering.

Existing

Thesis Option: Course Requirements

- Students must complete the following 4 graduate level courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo:
    - 1 of the following Biomedical Engineering core courses:
        - BME 601 Physiological Systems and Biomedical Design
        - BME 602 Foundations in Biomechanical Engineering
        - BME 603 Engineering Analysis of Living Cells
    - 1 of the following field-specific courses:
        - Biomaterials, Tissue Engineering and Drug Delivery
            - BIOL 636 Advanced Immunology
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            - CHE 612 Interfacial Phenomena
            - CHE 620 Applied Engineering Mathematics
            - CHE 640 Principles of Polymer Science
            - CHE 660 Principles of Biochemical Engineering
            - CHE 663 Bioseparations
            - CHE 760 Special Topics in Biochemical Engineering
            - ECE 601 Foundations of Biology in Engineering
            - KIN 657 Human Neuroanatomy
            - PHARM 609 Advanced Pharmacokinetics
            - PHARM 610 Topics in Drug Development
            - PHARM 617 Formulations
            - SYDE 684 Materials Biocompatibility
        - Biomechanics and Rehabilitation
            - AMATH 663 Fluid Mechanics
            - BME 550 Sports Engineering
            - BME 551 Biomechanics of Human Movement
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            - ME 621 Applied Finite Element Methods
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            - ME 780 Special Topics in Mechatronics Topic 37: Human Movement Neuromechanics
            - PHYS 752 Molecular Biophysics
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            - KIN 653 Human Neuroscience Theory
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            - ME 739 Manufacturing Processes Topics Topic 3: Materials for Nano & Microelectromechanical Systems

            - ME 739 Manufacturing Processes Topics Topic 15: Additive Manufacturing Design
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            - NANO 604 Nanomechanics and Molecular Dynamics Simulations
            - SYDE 750 Topics in Systems Modelling Topic 38: Social Robotics
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            - ECE 607 Fundamentals of Ultrasonics
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            - ECE 675 Radiation & Propagation of Electromagnetic Fields
            - ME 720 Special Topics in Solid Mechanics Topic 20: Acoustics
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            - SYDE 672 Statistical Image Processing
            - SYDE 675 Pattern Recognition
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            - AMATH 882 Mathematical Cell Biology
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            - KIN 607 Integrative Energy Metabolism in Health and Disease
            - KIN 608 Introduction to Genetics for the Biosciences
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            - KIN 653 Human Neuroscience Theory
            - KIN 654 Instrumentation in Neuroscience Research
            - SYDE 642 Cognitive Engineering Methods
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    - 2 elective courses
- One of the four courses shall be taken from outside the Faculty of Engineering.
- All courses must be completed by the end of term 4.
- All course selections are arranged by the supervisor(s) in consultation with the student and are subject to the approval of the Director or Associate Director, BME graduate program. Students pursuing one the program's Graduate Research Fields, should inform their supervisor(s) of their chosen field(s) to ensure appropriate course selection.
- Note: these requirements are in addition to satisfactory completion of any transitional courses that may be specified at the time of admission.
- Note: The Faculty of Engineering requires that no more than one-half of the courses used for credit toward a graduate degree may be taught by a candidate's supervisor(s). In the case of co-supervision in small research groups, it may be necessary to relax this rule; however, the student's file must contain a statement of formal approval from the BME graduate program director and endorsement from the Associate Dean for Graduate Studies and Postdoctoral Affairs in the Faculty of Engineering.

Thesis Option: Milestone Requirements

Professional Attributes and Competence Enhancement (PACE) Module

- The PACE module milestone includes the following three components: a Seminar series, PACE days, and Annual BME research day. The requirements for the three components are outlined below:
- Seminar series including presenting a research seminar:
    - Biweekly seminar series with students and internal and external BME speakers (1.5-hour duration). Guest speakers will also be invited to speak at the seminar series. The topics may be related to BME research, academic integrity, or professional development.
    - Each student must attend a minimum of five seminars per term, except for their final term. It is the student's responsibility to submit their "Seminar Attendance Certificates" attached to their term activity report. BME records should show that the number of seminars a student has attended is at least four times the number of terms the student has been enrolled as a full-time student in the program.
    - Each student will be required to present a research seminar by the end of their final term and as part of the PACE module milestones. BME will contact seminar candidates with scheduling information after they have passed their proposal.
- PACE Days:
    - Students are required to attend and participate in 2 PACE days at the beginning of terms 1, 2, and 3. PACE days are dedicated to students' professional development and the topics vary each term.
- Annual BME Research Day – once per year
    - Students are required to attend and present at the Annual BME Research Day. The annual event gives students an opportunity to showcase their progress and research findings while building community among BME graduate students. Students are required to submit an abstract and give either an oral or poster presentation.

Master's Thesis Proposal

- Students must develop and defend a thesis proposal that will be examined and approved by their supervisor and committee. The thesis proposal must be completed by the end of term 3.

Master's Thesis

- Students may choose to pursue one (1) of the following Graduate Research Fields:

    - Biomaterials, Tissue Engineering, and Drug Delivery
    - Biomechanics and Rehabilitation
    - Biomedical Signals and Devices
    - Biomedical Imaging Technology
    - Biomedical Informatics
- A Graduate Research Field is a university credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research concentrated in the area of the Graduate Research Field. The BME graduate program, represented by the student's supervisor and examining committee, must assess whether a student's completed research warrants the field designation at the time of degree completion.
- Upon approval of the thesis proposal, students will proceed to the research and writing of the thesis. Students must complete and orally defend the thesis by the end of term 6. The thesis and defence will be evaluated by the student's Advisory Committee. The Advisory Committee shall be comprised of: at least one tenured or tenure track faculty member from the BME graduate program who will normally be the student's supervisor(s); an additional tenured or tenure track BME graduate faculty member; and at least one additional examiner who is not a BME faculty member (but may be from a department with BME faculty members) and whose expertise can support the evaluation of the Master's thesis. Consistent with the Faculty of Engineering requirements, a maximum of one committee member with an adjunct appointment or emeritus status is permitted.

Notes

Workflow Information

Workflow Path
Committee approvals

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Senate Workflow
--

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

Admin Only - Proposal

Impact Changes

Senate Council Meeting Date

Senate Meeting Date

Admin Only

Include in Calendar
Graduate

End Date
No Date Chosen

Calendar Activation Date
04/29/2025

CM Program Code
MASc in Biomedical Engineering

Description

Status (Admin Override)
Active

Proposed
Admin Notes

Existing
Admin Notes
Editorial update to remove the "Special notice" since the program has been approved by the Ministry of Colleges and Universities.

Graduate Plan Code
BMETHM

Study Options
Thesis

Special Notice

UNIVERSITY OF WATERLOO | Senate

For Recommendation **Open Session**

To:	Senate Graduate & Research Council
From:	Office of the Registrar
Presenter(s):	Jennifer Coghlin Associate Registrar, Enrolment Services & Academic Policy
Date of Meeting:	June 16, 2025
Agenda Item:	**7.1 Academic Calendar Dates for 2026-27**

Recommendation/Motion

To recommend that Senate approve the 2026-2027 academic calendar dates and calendar guidelines for establishing academic dates, as presented.

Summary

The dates lay out major academic milestones throughout the year and provide guidance to units throughout the campus community as they conduct academic planning within their respective areas.

Jurisdictional Information

This item is being submitted to Senate in accordance with Senate Bylaw 2, section 4.03(a):

> Make recommendations to Senate with respect to the governance, direction and management of, or any changes in rules, regulations or policies for graduate studies and research in the university." section 5.03(a): "Make recommendations to Senate with respect to rules and regulations for the governance, direction and management of undergraduate studies in the university.

Governance Path

Senate Undergraduate Council approval date: June 16, 2025

Senate Graduate & Research Council approval date: June 16, 2025

Senate: September 22, 2025 [Prospective]

OFFICE OF THE REGISTRAR REPORT TO
SENATE UNDERGRADUATE COUNCIL and
SENATE GRADUATE & RESEARCH COUNCIL
June 2025

1. **REGULATIONS**

1.1 **Academic Calendar Dates for 2026-2027**

1.2 **Guidelines for Determining Academic Calendar of Dates**

Academic Calendar Dates, 2026-2027

	Fall 2026	**Winter 2027**	**Spring 2027**
Co-operative Work Term Begins	Sept. 8 (T)	Jan. 11 (M)	May 10 (M)
Classes Begin	Sept. 9 (W)	Jan. 11 (M)	May 10 (M)
Holidays	Oct. 12 (M) – Thanksgiving	Feb. 15 (M) – Family Day Mar. 26 (F) – Good Friday	May 24 (M) – Victoria Day July 1(R) – Canada Day July 2 (F) – Additional Day Aug. 2 (M) – Civic Holiday
Reading Week	Oct. 10-18 (S-U)	Feb. 13-21 (S-U)	N/A
Convocation	Oct. 23, 24 (F, S)	N/A	June 15-19 (T-S)
Classes End	Dec. 8 (T)	Apr. 12 (M)	Aug. 5 (R)
Make-up Day(s) for in-term holidays	N/A	Apr. 12 (M) for Mar. 26 (F)	Aug. 3 (T) for May 24 (M) Aug. 4 (W) for July 2 (F) Aug. 5 (R) for July 1 (R)
Pre-Examination Study Day(s)	Dec. 9 (W)	Apr. 13, 14 (T, W)	Aug. 6 (F)
Examinations Begin	Dec. 10 (R)	Apr. 15 (R)	Aug. 9 (M)
In-Person Exam Days for Online Courses	Dec. 11 (F) Dec. 12 (S) Dec. 18 (F) Dec. 19 (S)	Apr. 16 (F) Apr. 17 (S) Apr. 23 (F) Apr. 24 (S)	Aug. 13 (F) Aug. 14 (S) Aug. 20 (F)
Examinations on Sunday	Dec. 13 (U)	N/A	N/A
No Exams on the Following Days	Dec. 20 (U)	Apr. 18 (U) Apr. 25 (U)	Aug. 15 (U)
Examinations End (including Emergency Day)	Dec. 23 (W)	Apr. 30 (F)	Aug. 21 (S)
Co-operative Work Term Ends	Dec. 23 (W)	Apr. 30 (F)	Aug. 20 (F)
Teaching weeks/days	60 days	60 days	60 days
Pre-examination Study Day(s)	1	2	1
Examination days	12 + 1 emergency day	13 + 1 emergency day	11 + 1 emergency day

Symbols and abbreviations:
(M) Monday, (T) Tuesday, (W) Wednesday, (R) Thursday, (F) Friday, (S) Saturday, (U) Sunday, N/A – Not Applicable

Guidelines for Determining Academic Calendar of Dates

The following are principles and guidelines either formally agreed upon by Senate or adopted as common practice in determining the dates for the academic year.

1. That the practice of setting dates for each academic year continues to be an annual exercise.

2. That there be no fewer than 60 teaching days in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved. In calculating teaching days in a term, Saturdays, Sundays, and statutory or University holidays are excluded.

3. That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of ~~statutory~~ public holidays, the class schedule for a day different than the calendar day can be used to balance the number of course meets.

4. That fall convocation be the Friday and Saturday that fall in the third full week (beginning Sunday) of October.

5. That spring convocation be the Tuesday to Saturday in the second full week (beginning Sunday) in June.

6. That the Reading Weeks occur in all faculties in the fall and winter terms. They must begin on the Saturday before the public holidays of Thanksgiving Day and Family Day and will end on the following Sunday.

7. That fall term classes in September begin on the Wednesday following the Labour Day holiday. **Exception:** The Fall Term begins on Tuesday, September 8th when Labour Day is September 7th.

8. That the start date for winter term be set as follows:
   - If January 1st is a Sunday, then start of classes is Monday, January 9th.
   - If January 1st is a Monday, then start of classes is Monday, January 8th.
   - If January 1st is a Tuesday, then start of classes is Monday, January 7th.
   - If January 1st is a Wednesday, then start of classes is Monday, January 6th.
   - If January 1st is a Thursday, then start of classes is Monday, January 5th.
   - If January 1st is a Friday, then start of classes is Monday, January 11th.
   - If January 1st is a Saturday, then start of classes is Monday, January 10th.

9. The start date for spring term be set as follows:
   - If May 1st is a Sunday, then start of classes is Monday, May 9th.
   - If May 1st is a Monday, then start of classes is Monday, May 8th.
   - If May 1st is a Tuesday, then start of classes is Monday, May 7th.
   - If May 1st is a Wednesday, then start of classes is Monday, May 6th.
   - If May 1st is a Thursday, then start of classes is Monday, May 5th.
   - If May 1st is a Friday, then start of classes is Monday, May 11th.
   - If May 1st is a Saturday, then start of classes is Monday, May 10th.

10. That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of final examinations. A clear rationale for using fewer than two days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

11. That there be no fewer than 13 final examination days in the fall and winter terms, and 11 final examination days in the spring term. In addition, one Emergency Day with no scheduled final examinations is added to the end of the Final Examination Period.

12. In calculating final examination days, Saturdays which fall within the period are included, whereas Sundays and public or University holidays are excluded.
    Exceptions:
    Final examinations will not be scheduled on the Saturday following Good Friday when that day falls within the Final Examination Period or the Saturday of the Civic Day weekend.
    The first Sunday within the Final Examination Period may be used when required to accommodate the prescribed number of final examination days in the fall term.

13. That in the fall term no final examinations be scheduled beyond December 22nd. The Emergency Day cannot be scheduled beyond December 23rd.

14. That final examinations for online courses be scheduled on any Friday evening or Saturday within the Final Examination Period. And that final examinations for courses with both online sections and on-campus sections be scheduled together wherever possible. ~~Online Course Examination Days in each term be the first consecutive Friday and Saturday and the second consecutive Wednesday and Saturday in the examination period.~~

15. Grades due dates for on campus courses that have a scheduled final examination are normally scheduled seven days from the date of the final examination. Grades for online courses that have a scheduled final examination are due on the last day of the grades submission period. Grades for all courses without a scheduled final examination are normally due 14 days after the start of examinations.

16. Co-op work terms are expected to be 16 weeks in duration. Actual start and end dates may vary depending on employer or student requirements in consultation with Co-operative Education.

Rules that Require Exceptions with Rationale:

Rule 7
…That fall term classes in September begin on the Wednesday following the Labour Day holiday.
Exception*: The Fall Term begins on Tuesday, September 8th when Labour Day is September 7th.*

In order to accommodate the regular Orientation Programming schedule, 2026 fall term classes will begin on Wednesday, September 9, 2026.

Rule 11
…That there be no fewer than 13 final examination days in the fall and winter terms, and 11 final examination days in the spring term. In addition, one Emergency Day with no scheduled final examinations is added to the end of the Final Examination Period.

In order to accommodate the regular Orientation Programming schedule and beginning of classes on Wednesday, September 9, 2026, only 12 final examination days will be scheduled.

Rule 12
… The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.

With 2026 fall term classes beginning September 9, 2026, and the scheduling of only 12 final examination days, the first Sunday within the exam period was required for scheduling exams.

Prepared by:
C. Newell Kelly, Registrar, May 2025

Questions to be considered by SGRC members as they review the Centre/Institute renewal report:

- How successful has the Centre/Institute been in achieving its objectives during the period since its last approval?

- What value has the_ Centre/Institute added to the University community that wouldn't have existed otherwise? What novel research activities, initiatives and outputs has it fostered?

- How effectively has the Centre/Institute contributed to the educational mission of the institution through collaboration with Departments/Schools?

- To what extent have Graduate Students been involved in and benefitted from the activities and initiatives of the Centre/Institute?

- Has the Centre/Institute been successful in engaging external partners (e.g. industry, community, government)?

- Does the Centre/Institute have a robust governance structure?

- How strong is the 5-year plan, including future research directions and development strategies?

- What is the state of the Centre/Institute finances? How realistic is the projected budget for the next five years in terms of secured resources and the activities to be supported?

- How satisfied is leadership (e.g. Dept Chairs, Faculty Deans) and the membership of the Centre/Institute in terms of its current operations. How supportive are they for a further 5-year term?

UNIVERSITY OF WATERLOO

March 1st, 2025

Re: Waterloo Centre for Microbial Research Renewal Application

Dear Professor Dean,

I am writing to formally request the renewal of the Waterloo Centre for Microbial Research (WCMR) at the University of Waterloo. The WCMR was founded in 2017 and over the last 7 years has made significant contributions to the areas of pathogen surveillance, microbiomes, and biomanufacturing research aligning strongly with Waterloos research priorities and Health, Sustainable, Technological, and Economic futures.

The importance of microbes and their effects on society were highlighted by the global pandemic. Technological advances in the last 10 years has transformed biology from a scientific endeavour to one you can engineer. Metagenomic and Engineering Biology is where Waterloo can be a world leader.

During the period under review, the WCMR has supported the development of strong interdisciplinary research teams securing over $7M in research funding for microbial surveillance, biomanufacturing, and metagenomics research. The WCMR is supporting a current NSERC CREATE, and two CFI-IF grant applications primarily composed of WCMR team members. The WCMR has also hosted meetups, research talks, conferences, and other activities driven by faculty engagement in the centre. These events serve to create a strong community prepared to engage in new collaborations and new grant opportunities.

The WCMR has received a commitment from the Dean of Science to continue funding our operations at $37,500/year. We have also several grants under consideration that will support WCMR operations.

Thank you for your kind consideration,

Valerie Ward, PhD, P.L.Eng (np)
Interim Director of the Waterloo Centre for Microbial Research (WCMR)
Tier 2 Canada Research Chair in Microalgae Biomanufacturing
Associate Professor, CRC – Algae Biomanufacturing,
Department of Chemical Engineering, University of Waterloo

WCMR
WATERLOO CENTRE FOR
MICROBIAL RESEARCH

Progress Report
2019-2024

Prepared by:

Waterloo Centre for Microbial Research Executive Committee

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Canada Research Chair in Microalgae Biomanufacturing (Tier 2)

Interim Director, WCMR

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Associate Director, WCMR

Trevor Charles, Professor, Biology

Founding WCMR Director (2009-2024)

Brenda Panasiak

Administrative Coordinator, WCMR

1 Executive Summary

The WCMR was founded in 2017 and aims to encourage and support microbial research at the University of Waterloo. Key tenets of the WCMR are interdisciplinarity and collaboration. To support and encourage interdisciplinary research the WCMR has facilitated connections between researchers, faculty, and students on campus, supported grant writing on NSERC CREATE, LSARP, OMFRA, CFI-IF, CBRF, and international (EU, NSF) applications, resulting in several funded interdisciplinary collaborations.

Throughout the pandemic, WCMR researchers developed significant strength in microbial surveillance resulting in a Global Prominence in COVID-19 in the 99th percentile (SciVal, 2021-2024) and over $2M in research funding. The WCMR supported this research through direct coordination of the first COVID-19 genomics study on campus which later evolved into partnerships to analyze wastewater from municipal (Waterloo Regional) and international (Toronto Pearson) airports as well as regional hospitals for respiratory virus surveillance and now antimicrobial resistance surveillance. The WCMR also helped enable the founding of the Waterloo Centre for Genomics Surveillance through the donation of equipment from WCMR faculty members, by supporting a CFI-JELF application (awarded in 2023 for a NextSeq2000), and is currently supporting a CFI-IF application (Feb 2025) that includes 7 WCMR members.

COVID-19 also opened new opportunities for research funding through the new Canadian Biomedical Research Fund of which the WCMR supported two applications, the INSPIRE network which is developing new techniques for genomic surveillance of pathogens, and BioHubNet, a biomanufacturing training network through which WCMR graduate students can access funding for internships, academic exchanges, and micro credentialing/hands-on training in biomanufacturing. The WCMR is currently supporting three major research initiatives through event support, grant support, conference support, as needed including a recently funded Global Centers (NSF/NSERC) grant on the circular economy and biomanufacturing, an NSERC CREATE (under review) on developing entrepreneurship skills in biotechnology graduate students, and another CFI-IF to develop a rapid prototyping system for synthetic biology and biomanufacturing (Feb 2025).

To increase our international collaborations, the WCMR was the Canadian representative on a EU grant dedicated to mapping microbiome research around the world, and through this became a founding member of the MicrobiomeSupport Association which is an EU based organization focused on international and interdisciplinary collaboration. The WCMR is also a member of the Phytobiome Alliance and several of their working groups to support policy development around microbiomes in agriculture applications.

The WCMR will continue to support our members to enable collaborations and the activities needed to successfully pursue large collaborative grants, international opportunities, and our internal collaborations.

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2 Objectives

The Waterloo Centre for Microbial Research (WCMR) at the University of Waterloo was formed in 2017 to promote research and education in the application of microbiology principles and techniques to address environmental, industrial, and human health challenges. The goals of the WCMR are to promote synergy amongst researchers, coordinate efficient access to facilities, serves as a focal point for interactions with government, industry, and other external organizations, and foster community, collaboration, and education amongst students, trainees, researchers, and external partners.

For the next five years, the WCMR has set several priorities, which remain consistent with initial / prior objectives:

- Increase engagement of industry and external partners in WCMR activities and forge partnerships with WCMR members seeking collaborators.
- Investigate the possibility of a decentralized WCMR shared facility to foster greater collaboration amongst members and with external parties and provide support to members to make their infrastructure more accessible. One long term goal is to seek out a physical footprint on campus as the shared infrastructure grows.
- Continue to foster collaborative grant applications, support large grant administration, support conference logistics and other events support as needed (CFI-IF WGSC, NSERC CREATE Biotech, CBRF INSPIRE, Global Centres CIRCLE, etc.)
- Work with other centres on campus (e.g., WICI) to develop workshops to engage more external partners and develop state-of-the-art research skills (AI for research and Enclosed Agriculture Systems workshops)
- Increase integration of undergraduate and graduate students in the operation of the centre.

Impact of the pandemic

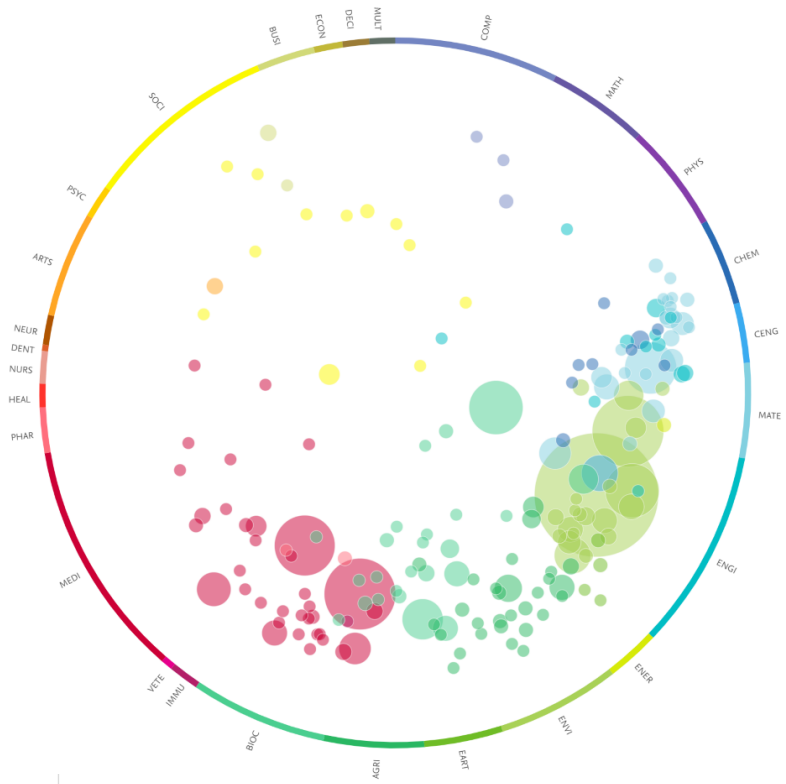
In the past few years (2020-2022), the pandemic resulted in significant impacts to the activities of the WCMR and its members. While some activities halted, there was the emergence of several new opportunities for WCMR members to reposition themselves in this new context (due to new funding opportunities or the elimination of existing funding programs). However, **the pandemic highlighted the need, importance, and relevance of microbiology related training, skills, education, and research activities in Canada.**

3 WCMR Impact

To better understand the impact of WCMR researchers, an analysis was completed using SciVal for publications from 2021-2024:

This shows several areas with high scholarly output: COVID-19 related research, metagenomics, waste treatment and other engineering aspects of microbiology.

WCMR researchers published over 400 papers in the last 4 years with 71 articles in the top 10% most cited publications worldwide. Almost half (49.2%) of all publications were in Q1 journals according to CiteScore journal rankings.



COMP	Computer Science	MEDI	Medicine
MATH	Mathematics	PHAR	Pharmacology, Toxicology and Pharmaceutics
PHYS	Physics and Astronomy	HEAL	Health Professions
CHEM	Chemistry	NURS	Nursing
CENG	Chemical Engineering	DENT	Dentistry
MATE	Materials Science	NEUR	Neuroscience
ENGI	Engineering	ARTS	Arts and Humanities
ENER	Energy	PSYC	Psychology
ENVI	Environmental Science	SOCI	Social Sciences
EART	Earth and Planetary Sciences	BUSI	Business, Management and Accounting
AGRI	Agricultural and Biological Sciences	ECON	Economics, Econometrics and Finance
BIOC	Biochemistry, Genetics and Molecular Biology	DECI	Decision Sciences
IMMU	Immunology and Microbiology	MULT	Multidisciplinary
VETE	Veterinary		

WCMR research was cited in 52 policy documents in 13 different countries over the last 4 years indicating the research undertaken by WCMR members is highly relevant and being used to guide government policy.

3.1 Research Accomplishments by Topic Area

Due to the pandemic, WCMR members took the opportunity to develop a strength in microbial/pathogen surveillance. These initiatives are outlined below.

1. Microbial Surveillance

Asymptomatic Saliva Testing Research at Waterloo (ASTRAW) & Wastewater Testing

WCMR members: ***Charles, Nissimov***

One example of new funding opportunities was UW institutional funding aimed at rapidly increasing pandemic related research. **Charles** and **Nissimov** worked to develop new sequencing methods for common respiratory viruses in nasal secretions. The WCMR coordinator (0.5 FTE) was further hired to manage this project, recruit participants, and collect the samples from asymptomatic individuals. This work laid the foundations for a collaboration with Mark Servos and other WCMR members (**Aucoin**) on wastewater surveillance. This grant supported the purchase of equipment at Waterloo (qPCR/biosafety cabinet) and due to its initial success, was extended to testing wastewater from

local airports. The Greater Toronto Airport Authority (GTAA) worked with the team to monitor the arrival of new SARS-CoV-2 lineages and their spread in the surrounding communities.

INSPIRE – Integrated Network for the Surveillance of Pathogens ($12,940,731 total, Lead: Robert McKay Windsor)

*WCMR members**: Charles, Doxey***

One example of new funding opportunities was the Canadian Biomedical Research Fund (CBRF). This grant opportunity offered significant funding to support pandemic related research. The saliva testing and airport/municipal wastewater research led to the formation of a large network of researchers in Canada working to develop technology to quickly detect evolving pathogens in our communities.

Hospital Floor Swabbing

*WCMR members**: Hug***

During the pandemic, Hug worked with clinicians to develop and monitor hospitals for SARS-CoV-2 and this work has evolved into monitoring for other commonly found respiratory viruses like influenzae and to search out antimicrobial resistance genes.

Waterloo Genomic Surveillance Centre (WGSC), CFI-JELF ($1,415,546), CFI-IF ($6,899,785 for 2025)

WCMR members: ***Charles, Ward, Ingalls, Doxey, Hug, Muller, Neufeld, Olaitan***

As a result of the success of the wastewater work, and the growing number of researchers at Waterloo needing more specialized support for DNA sequencing project, the WGSC was founded in 2024 by the Dean of Science. This core facility reports directly to the Research Office, however, to start the facility, specialized equipment from WCMR members was moved into the renovated space in 2024. This includes a NextSeq2000 and several MiSeqs as well as some Nanopore sequencing devices which is >$1M of equipment. WCMR has signed an MOU with the WGSC to help promote the WGSC services to members and external partners as well as organized joint training sessions for WCMR members and students on advanced sequencing techniques including one in Spring 2024 by Illumina and one in Winter 2024 by Oxford Nanopore.

2. Metagenomics & Microbiome Research

Microbiome Support Association (51, 250 €)

WCMR members: ***Charles***

Successful EU grant where Canada is represented by the WCMR. The funding was used to support coop students who helped to map the microbiome related research in Canada which was assembled into an international report. After the completion of the EU funding, the network was converted into an association. The WCMR is one of the founding members of the MSA which is dedicated to understanding the role of microbes and the microbiome in food security, health, and well-being. It facilitates international opportunities for WCMR members and EU partner universities. Charles is one of the MSA Board Members however this will rotate to other WCMR members in the future. We are the only North American member.

NORUSCASA (disrupted by pandemic) & Functional Metagenomics 2022

WCMR members: ***Charles, Hug***

Research Council of Norway funded project designed to increase collaboration between Norwegian researchers and Waterloo researchers in the area of functional metagenomics for biopharmaceutical innovation. This group jointly planned and hosted the 2022 International Functional Metagenomics conference in Niagara on the Lake. The WCMR was integral to organizing this conference and provided some sponsorship. HQP mobility elements were disrupted by the pandemic.

Phytobiomes Alliance & Conference

WCMR members: ***Charles***

WCMR is the Chair of the Controlled Environment Working Group, a members of the regulatory working group and was a member of the coordinating committee for the Phytobiomes Alliance WCMR sponsors their conference for $5000/year. There are opportunities for WCMR members to attend and network with other members to pursue international funding opportunities. Biomanufacturing & Synthetic Biology Research

3. Biomanufacturing

NSF/NSERC Global Centres (CIRCLE) Project ($2.5M) WCMR

WCMR members: ***Euler, Ward, Charles, Mekonnen, and Liu***

WCMR members Euler, Ward, Charles, Mekonnen, and Liu were awarded a $2.5M NSERC Global Centres grant in 2024. As part of this application, the WCMR will help with the logistics and planning of one of the five international symposiums planned as part of this grant. The WCMR will also help with logistical support for the yearly travel of all grant members and their students to this yearly conference. The WCMR helped engaged industrial partners who also supported this grant application including Ontario Genomics and MetaCycler.

BioHubNet: Biomanufacturing Training Network ($19M, Lead: Molly Shoichet University of Toronto)

WCMR members: ***Ward, Charles***

The CBRF also funded another training network at $19M led by the University of Toronto. Ward, Interim WCMR Director is a Co-PI on this network and is the Industrial Innovation Theme Lead. As a training network, Charles was appointed the Waterloo Representative to the operational committee. This grant will provide funding directly to students from the 6 participating institutions to support their training in health surveillance, biomanufacturing innovation, and precision medicine. This support will be for internships, academic exchanges, and commercialization post-docs.

SynBio 4.0 Conference

WCMR Members: ***Ward, Ingalls, Charles***

The WCMR sponsored and helped organize the SynBio 4.0 conference in 2019 which was Chaired by Ward, Charles, and Ingalls. The conference brought together over 175 undergraduate and graduate students, faculty members, industry representatives, and government officials for 3 days of workshops and research. On the Sunday, professors from all over Canada taught workshop style tutorials aimed at an undergraduate audience and held a discussion panel on the state of synthetic biology education in Canada. WatSAM and Ontario/Quebec iGEM team students (from Waterloo and

other Ontario Universities) and WCMR graduate student members were invited to attend these sessions to learn about designing genetic circuits, modeling metabolism, and constructing synthetic genomes. The remaining 1.5 days were composed of research talks by an invited keynote (CRC in Synthetic Biology), the President of Ontario Genomics, and from submitted abstracts. It included a poster session and award dinner.

Biochemical and Biological Engineering & Synthetic Biology (BBSB) Conference

WCMR Members: ***Ward, Aucoin***

Conference held for Ontario and Quebec applied biotechnology researchers and students. Over 75 attendees for 1 day of research talks, a poster session, and a conference dinner. WCMR provided support for the organization as well as sponsorship to reduce student fees.

3.2 On-going Activities

3.2.1 Monthly Meet Up 2017 - Present

First begun as an environmental journal club in 2017 by WCMR member Hug, faculty members and graduate student members would meet monthly to discuss the newest research published in the area of environmental biology. After a brief hiatus during the pandemic, the Monthly Meet Up was restarted by WCMR member Smith who coordinates a mix of invited external lectures and graduate student presentations from WCMR members.

3.2.2 Hack the plastics 2020

In 2019, the WCMR organized a hackathon to develop microbial solutions to the plastic disposal problem. The teams had 11 h to propose a microbial solution to the plastic problem, develop a business plan and pitch it to the judges. WCMR members served as judges and started the event with a panel discussion to kick off the event. Over 100 attendees participated in the hack-a-thon.

3.2.3 Open House 2023-Present

Every term since Winter 2023 the WCMR has held an open house where faculty and student members can meet up with the WCMR executive committee (Currently: Charles, Ward, Jandu) and each other to network, increase collaboration, discuss interdisciplinary research, and for the EC to keep engaged with the members and their interests. Typically, around 15 members attend every open house and helps keep members engaged in WCMR operations.

3.2.4 Gairdner National Lecture 2024

In 2024, the WCMR supported the Dean of Science in hosting the Gairdner National Lecture by Dr. Christian Landry. Event support includes booking of rooms, advertising on campus and arranging lunch and meetings with faculty on campus.

3.2.5 iGEM Support

Many of the WCMR members are advisors to the Waterloo iGEM team. The iGEM team enters an international competition every year to genetically engineer a machine (usually a microbe). The team meets regularly with WCMR members to discuss the lab, modeling, and human factors plans for their jamboree every year. The WCMR supports the team with some funding for their lab work and conference fee each year. Charles, Ward, Aucoin, Ingalls, Doxey, and others depending on the topic

selected each year, actively support the iGEM team. Many iGEM team members go on to complete 4th year theses with WCMR faculty members.

3.2.6 WatSAM Support

WatSAM is an undergraduate student club dedicated to microbiology. They help to foster relationships between WCMR members and undergraduate students interested in studying microbiology through undergraduate research assistantships or 4th year thesis projects for example. WatSAM regularly holds events like lab skills workshops and talks on things like the microbiology of black tea.

3.3 Current Membership List

Name	Title	Department	Faculty
William Anderson	Professor	Chemical Engineering	Engineering
Maricor Arlos	Assistant Professor	Civil and Environmental Engineering	Engineering
Marc Aucoin	Associate Professor	Chemical Engineering	Engineering
Trevor Charles	Professor	Biology	Science
Perry Chou	Professor	Chemical Engineering	Engineering
Alexis Dolphin	Assistant Professor	Anthropology	Arts
Andrew Doxey	Assistant Professor, URC	Biology	Science
Bernard Duncker	Professor & AVP, Research International	Biology	Science
Christian Euler	Assistant Professor	Chemical Engineering	Engineering
John Honek	Professor	Chemistry	Science
Laura Hug	Assistant Professor, CRC, RSC New College	Biology	Science
Brian Ingalls	Associate Professor	Applied Mathematics	Math
Narveen Jandu	Associate Professor	Biology	Science
Yilan Liu	Associate Professor	Chemical Engineering	Engineering
Kesen Ma	Associate Professor	Biology	Science
Shannon Majowicz	Associate Professor	School of Public Health and Health Systems	Health
Brendan McConkey	Associate Professor	Biology	Science
Jenine McCutcheon	Assistant Professor	Earth and Environmental Sciences	Science
Tizazu Mekonnen	Associate Professor, CRC	Chemical Engineering	Engineering
Christine Moresoli	Professor	Chemical Engineering	Engineering
Kirsten Müller	Professor, Department Chair	Biology	Science
Josh Neufeld	Professor, URC	Biology	Science
Jozef Nissimov	Assistant Professor	Biology	Science

Maren Oelbermann	Professor	School of Environment, Resources and Sustainability	Environment
Abiola Olaitan	Assistant Professor	Biology	Science
Wayne Parker	Professor	Civil and Environmental Engineering	Engineering
David Sychantha	Assistant Professor	Chemistry	Science
Sherry Schiff	Professor	Earth and Environmental Sciences	Science
Matthew Scott	Assistant Professor	Applied Mathematics	Math
Roderick Slavcev	Associate Professor	School of Pharmacy	Science
Maria Strack	Associate Professor	Geography and Environmental Management	Environment
Valerie Ward	Associate Professor, CRC	Chemical Engineering	Engineering

3.4 Reflections of the Membership

The WCMR has been very successful over the last 5 years due to the high level of faculty and graduate student engagement. Here are some reflections from the members:

> "WCMR has helped facilitate connections with other researchers and collaborations or sharing of resources. Outreach, seminar and other educational activities add value to my research and my students or other group members. Opportunities to meet and discuss shared but different interests has helped with cross-pollination and new research activities or ideas". – Bill Anderson, Professor, Chemical Engineering

> "WCMR helps connect us microbiologists from across campus so we connect more, which leads to connections, conversations, and collaborations we would not otherwise be having". – Josh Neufeld, Professor, Biology

> "The WCMR has reduced barriers to cross-Faculty conversations and collaborations. I've connected with several people in Engineering and Environment who I may not have otherwise been aware of. My students have benefited from panel discussions and student-led events, gaining volunteer experience and broadening their networks. I think the center plays an important role uniting microbiology researchers across campus". – Laura Hug, Assistant Professor, Biology

> "WCMR activity has allowed the UW microbiology community to maintain a high level of interconnected activity. The speaker sessions and social mixers are great opportunities for students and faculty to learn from each other in this interdisciplinary area. Moreover, the dedicated support for travel has allowed my students more freedom to interact with the broader microbiology community. Coming from the Math Faculty, where there is minimal microbiology activity, the centre's activity is especially important to my group". – Brian Ingalls, Associate Professor, Applied Mathematics

> "As a new faculty member who values research collaboration within and across microbiology, I appreciate the opportunities WCMR provides for my team to connect with researchers within the UW community, fostering collaboration, particularly in microbial

research. Additionally, through WCMR's activities, including the dissemination of relevant information, I have been made aware of regional and national microbiology research events that align with my work. This has created a supportive ecosystem for establishing my research program since joining UW". – Abiola Olaitan, Assistant Professor, Biology

"Small funding opportunities can be helpful for collaborative work on microbiology including the application of modern molecular techniques. The WCMR also hosts events which are helpful for networking". – Maren Oelbermann, Professor, School of Environment, Resources and Sustainability

"The WCMR has been an excellent opportunity for junior faculty members to connect with those outside of their departments and faculties leading to many opportunities for interdisciplinary collaborations. We have worked together with WCMR members to host events that make our students experiences more enriching and support biotechnology research on campus." - Valerie Ward, Chemical Engineering

"WCMR facilitates cross-faculty collaboration to address societal challenges using the tools of microbiology. It is also available to provide administrative support for large interdisciplinary research projects involving the many microbiology researcher from across campus." – Trevor Charles, Biology, Inaugural Director of the WCMR

3.5 Faculties participation in WCMR

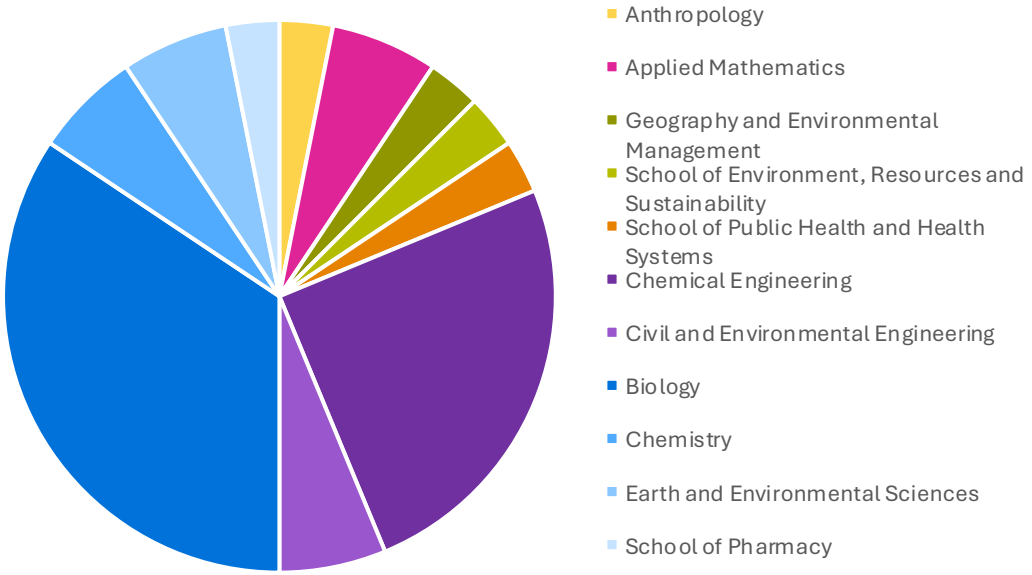


Figure - WCMR has member representation from Waterloo's six faculties: Science (16), Engineering (10), Environment (2), Math (2), Health (1), and Arts (1).

3.6 Graduate Student Participation

Graduate student participation has been harder to gauge as we don't have a formal method of maintaining a list of these members. Going forward, this will be one activity that the WCMR

undertakes by inviting a graduate student member to our executive committee to increase engagement and create leadership opportunities for students.

We see graduate student participation primarily through our mailing lists, termly events like the WCMR open house, workshops and research talks that are well attended (>20 students attending each talk), and through applications for our small student travel funds ($500) which support student to attend conferences like the Canadian Microbiology Conference. These students also supported the WCMR in graduate student recruitment by running the WCMR information booth during this conference for 1h each. Students also supported larger events like the Plastics Hack-a-thon, and the SynBio 4.0 conference.

Currently we estimate the graduate student members to be over 100 members.

4 Organization Chart

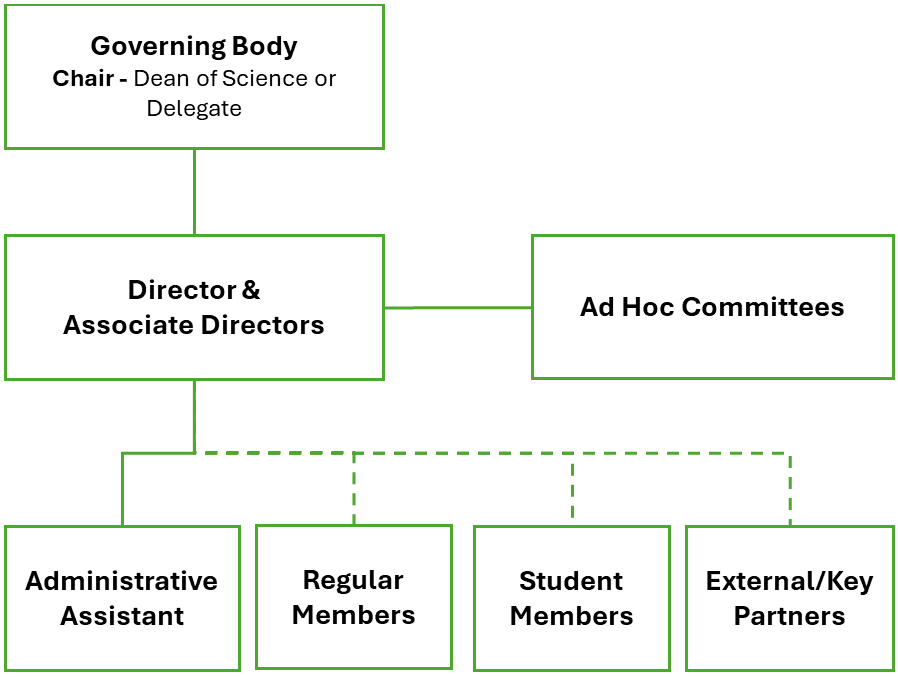


Figure - Organizational structure of the WCMR. Please see constitution for full definition of each role.

5 Financial Statements

		2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
		Year 1	Year 2	Year 3	Year 4	Year 5	Extension Year 1	Extension Year 2	Current Year
Faculty Sponsorship:									
Science:	$ 41,000.00								
AHS:	$ 3,500.00								
Engineering:	$ 17,000.00				not rec'd				
Environment:	$ 8,500.00								
Mathematics:	$ 5,000.00								
Total Faculty Sponsorship:		$ 75,000.00	$ 75,000.00	$ 75,000.00	$ 58,000.00	$ 75,000.00			
Other Sponsorship Revenue:		$ 3,000.00		$ 6,555.80	$ 70.40			$ 16,861.93	
Budget Carryover from previous year:			$ 35,698.00	$ 76,306.00	$ 88,449.00	$ 115,490.00	$ 145,507.00	$ 119,492.00	$ 97,424.00
Total Operating Budget:		**$ 78,000.00**	**$ 110,698.00**	**$ 157,861.80**	**$ 146,519.40**	**$ 190,490.00**	**$ 145,507.00**	**$ 136,353.93**	**$ 97,424.00**
Account	Expenses	Year 1	Year 2	Year 3	Year 4	Year 5	Extension Year 1	Extension Year 2	Current Year
	Sales and Services Revenue								
	Salary	$ 25,022.42	$ 26,000.04	$ 35,749.98	$ 25,701.29	$ 12,641.55	$ 16,770.17	$ 9,711.90	$ 9,225.44
	Supplies and Oth	$ 14,227.83	$ 4,083.29	$ 19,659.32	$ 995.88	$ 7,341.77	$ 8,953.23	$ 14,788.08	$ 12,407.33
	Sponsorship Fees	$ -	$ -	$ -	$ -	$ 25,000.00	$ -	$ 10,000.00	
	Travel	$ 1,164.98	$ 11,382.86	$ 8,153.25	$ 4,332.15		$ 291.94	$ 4,429.99	$ 5,681.87
	Computers	$ 1,885.97	$ 155.99	$ -	$ -				
Operating Expenses:		**$ 42,301.20**	**$ 41,622.18**	**$ 63,562.55**	**$ 31,029.32**	**$ 44,983.32**	**$ 26,015.34**	**$ 38,929.97**	**$ 27,314.64**
	Operating Budget:	$ 78,000.00	$ 110,698.00	$ 157,861.80	$ 146,519.40	$ 190,490.00	$ 145,507.00	$ 136,353.93	$ 97,424.00
	Expenses:	$ 42,301.20	$ 41,622.18	$ 63,562.55	$ 31,029.32	$ 44,983.32	$ 26,015.34	$ 38,929.97	$ 27,314.64
	Balance	**$ 35,698.80**	**$ 69,075.82**	**$ 94,299.25**	**$ 115,490.08**	**$ 145,506.68**	**$ 119,491.66**	**$ 97,423.96**	**$ 70,109.36**

6 Five Year Plan

6.1 Budget

WCMR has operated on a budget of $75,000 funded annually from the faculties with supplemental funding from revenue collected from various conferences and events. Due to budgetary constraints in 2025 and changes to the funding models for centers and institutes, the WCMR is planning to use the current unspent operating funds, the support from the Dean of Science ($37,500/year) and funds from several grants for administration support (tentative) to support operations. Currently, our staff member is hired on a casual basis, however, should the NSERC CREATE and NSERC Alliance grants be awarded, the WCMR will seek out a full-time staff to administer those programs and support the WCMR.

In summary, the WCMR has enough funds to continue operations for the next 5 years at the current level of activity as our activities are strongly driven by member engagement. A summary of expected expenses can be found in the table below.

Projected Budget 2025-2030

Revenue	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Faculty of Science	$37,500	$37,500	$37,500	$37,500	$37,500
NSERC Alliance Advantage (tentative)	$10,000	$10,000	$10,000	$10,000	$10,000
NSERC CREATE (tentative)	$30,000	$30,000	$30,000	$30,000	$30,000
Carry Over	**$70,109**	-	-	-	-
Total Confirmed Revenue	**$37,500**	**$37,500**	**$37,500**	**$37,500**	**$37,500**

Expenses	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Salaries	$20,000	$20,000	$20,000	$20,000	$20,000
Travel	$5,000	$5,000	$5,000	$5,000	$5,000
Sponsorship Fees	$5,000	$5,000	$5,000	$5,000	$5,000
Student Teams	$6,000	$6,000	$6,000	$6,000	$6,000
Events	$5,000	$5,000	$5,000	$5,000	$5,000
Supplies	$500	$500	$500	$500	$500
Total Expenses	**$41,500**	**$41,500**	**$41,500**	**$41,500**	**$41,500**
Total Budge Available	$70,109	$66,109	$62,109	$58,109	$54,109
Carry Over	**$28,609**	**$24,609**	**$20,609**	**$16,609**	**$12,609**

6.2 Research Directions and Development Strategies

The WCMR will continue to focus on the support strategies that have found excellent traction with the members. These include:

- Regular meetups for members and graduate students
- Research Talks (Upcoming: Jon Stokes, AI & Antibiotics, March 13th, 2025)

- Research Symposium (TBD. Organizers: Smith & Olaitan)
- International Organizations (Microbiome Support Association, Phytobiome Alliance, SynBio Canada)
- Grant development (NSERC CREATE, CFI-IF, Alliance Advantage, etc.)

We will seek to expand this support to help members connect with European partners for EU grants that Canadian Researchers are now eligible for. The WCMR will also seek to improve access to equipment on campus by forming a decentralized shared space. This will allow students to access equipment and share experimental protocols more readily).

The WCMR will also seek to increase graduate student participation in the Centre leadership. This will provide professional development opportunities and leadership opportunities for these students. We will continue to support our undergraduate student teams with funding and scientific advice through our members participation as team advisors.

Finally, the WCMR will offer a large suite of training opportunities for students through the tentative NSERC CREATE program in creating biotechnology entrepreneurs.

7 Appendix A: List of Publications

Title	Authors	Year	Journal or Conference
Arctic tundra soil depth, more than seasonality, determines active layer bacterial community variation down to the permafrost transition	Christiansen, C.T. | Engel, K. | Hall, M. | Neufeld, J.D. | Walker, V.K. | Grogan, P.	2025	Soil Biology and Biochemistry
Implementing differential recovery corrections enhances accuracy of mass balances on microplastics in wastewater treatment	Zhu, Z. | Parker, W.J.	2025	Water Research
Co-consumption for plastics upcycling: A perspective	Weldon, M. | Ganguly, S. | Euler, C.	2025	Metabolic Engineering Communications
Environmental drivers of increased ecosystem respiration in a warming tundra	Maes, S.L. | Dietrich, J. | Midolo, G. | Strack, M | + 30 others	2024	Nature
Enigmatic persistence of aerobic methanotrophs in oxygen-limiting freshwater habitats	Reis, P.C.J. | Tsuji, J.M. | Weiblen, C. | Schiff, S.L. | Scott, M. | Stein, L.Y. | Neufeld, J.D.	2024	ISME Journal
Catalytic and biocatalytic degradation of microplastics	Zandieh, M. | Griffiths, E. | Waldie, A. | Li, S. | Honek, J. | Rezanezhad, F. | Van Cappellen, P. | Liu, J.	2024	Exploration
Anoxygenic phototroph of the Chloroflexota uses a type I reaction centre	Tsuji, J.M. | Shaw, N.A. | Nagashima, S. | Venkiteswaran, J.J. | Schiff, S.L. | Watanabe, T. | Fukui, M. | Hanada, S. | Tank, M. | Neufeld, J.D.	2024	Nature
Stable aqueous dispersions of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) polymer for barrier paper coating	Pieters, K. | Mekkonnen, T.H.	2024	Progress in Organic Coatings
Molecular level investigation of interactions between pharmaceuticals and β-cyclodextrin (β-CD) functionalized adsorption sites for removal of pharmaceutical contaminants from water	Demircan Ozelcaglayan, E. | Honek, J.F. | Parker, W.J.	2024	Chemosphere
Real-time evaluation of signal accuracy in wastewater surveillance of pathogens with high rates of mutation	Thakali, O. | Mercier, É. | Eid, W. | Wellman, M. | Brasset-Gorny, J. | Overton, A.K. | Knapp, J.J. | Manuel, D. | Charles, T.C et al.	2024	Scientific Reports
A Novel Tiled Amplicon Sequencing Assay Targeting the Tomato Brown Rugose Fruit Virus (ToBRFV) Genome Reveals Widespread Distribution in	Nash, D. | Ellmen, I. | Knapp, J.J. | Menon, R. | Overton, A.K. | Cheng, J. | Lynch, M.D.J. | Nissimov, J.I. | Charles, T.C.	2024	Viruses

Title	Authors	Year	Journal or Conference
Municipal Wastewater Treatment Systems in the Province of Ontario, Canada			
Tracking SARS-CoV-2 variants of concern in wastewater: an assessment of nine computational tools using simulated genomic data	Sutcliffe, S.G.| Kraemer, S.A.| Ellmen, I.| Knapp, J.J.| Overton, A.K.| Nash, D.| Nissimov, J.I.| Charles, T.C et al.	2024	Microbial Genomics
Implementing an adaptive, two-tiered SARS-CoV-2 wastewater surveillance program on a university campus using passive sampling	Haskell, B.R.| Dhiyebi, H.A.| Srikanthan, N.| Bragg, L.M.| Parker, W.J.| Giesy, J.P.| Servos, M.R.	2024	Science of the Total Environment
Etiology-specific incidence and mortality of diarrheal diseases in the African region: a systematic review and meta-analysis	Thystrup, C.| Majowicz, S.E.| Kitila, D.B.| Desta, B.N.| Fayemi, O.E.| Ayolabi, C.I.| Hugho, E.| Buys, E.M.| Akanni, G.B.| Machava, N.E.| Monjane, C.| Hald, T.| Pires, S.M.	2024	BMC Public Health
Nonparametric richness estimators Chao1 and ACE must not be used with amplicon sequence variant data	Deng, Y.| Umbach, A.K.| Neufeld, J.D.	2024	ISME Journal
Review of the Potential of Probiotics in Disease Treatment: Mechanisms, Engineering, and Applications	Liu, M.| Chen, J.| Dharmasiddhi, I.P.W.| Chen, S.| Liu, Y.| Liu, H.	2024	Processes
Development of an innovative technology using side stream vacuum evaporation for anaerobic digestion intensification and ammonia recovery	Khadir, A.| Jang, E.| Santoro, D.| Walton, J.| Al-Omari, A.| Muller, C.| Y. Bell, K.| J.M. Wells, M.| Parker, W.| Nakhla, G.	2024	Chemical Engineering Journal
Advancing Evaluation of Microplastics Thresholds to Inform Water Treatment Needs and Risks	Chowdhury, O.S.| Schmidt, P.J.| Anderson, W.B.| Emelko, M.B.	2024	Environment and Health
AnnoView enables large-scale analysis, comparison, and visualization of microbial gene neighborhoods	Wei, X.| Tan, H.| Lobb, B.| Zhen, W.| Wu, Z.| Parks, D.H.| Neufeld, J.D.| Moreno-Hagelsieb, G.| Doxey, A.C.	2024	Briefings in Bioinformatics
Quantifying the removal of polybrominated diphenyl ethers (PBDEs) in physical, chemical, and biological sludge treatment systems	Lakshminarasimman, N.| Gewurtz, S.B.| Parker, W.J.| Smyth, S.A.	2024	Chemosphere
Sporadic diurnal fluctuations of cyanobacterial populations in oligotrophic temperate systems can prevent accurate characterization of change and risk in aquatic systems	Cameron, E.S.| Krishna, A.| Emelko, M.B.| Müller, K.M.	2024	Water Research

Title	Authors	Year	Journal or Conference
SARS-CoV-2 viral titer measurements in Ontario, Canada wastewaters throughout the COVID-19 pandemic	D'Aoust, P.M.| Hegazy, N.| Ramsay, N.T.| Yang, M.I.| Dhiyebi, H.A.| Edwards, E.| Servos, M.R.| Ybazeta, G.| Habash, M.| Goodridge, L.| Poon, A.| Arts, E.| Brown, R.S.| Payne, S.J.| Kirkwood, A.| Simmons, D.| Desaulniers, J.-P.| Ormeci, B.| Kyle, C.| Bulir, D.| Charles, T et al.	2024	Scientific Data
Cobalt as a potential limiting factor for heterocyst frequency in nitrogen-limited Aphanizomenon and Dolichospermum: Evidence from experimental and field studies	Shah, P.| Venkiteswaran, J.J.| Molot, L.A.| Higgins, S.N.| Schiff, S.L.| Baulch, H.M.| Zastepa, A.	2024	Freshwater Biology
A comprehensive floc model for simulating simultaneous nitrification, denitrification, and phosphorus removal	Bai, X.| Hazi, F.| Takacs, I.| Wadhawan, T.| Parker, W.J.	2024	Science of the Total Environment
Environmental and Management Drivers of Carbon Dioxide and Methane Emissions From Actively-Extracted Peatlands in Alberta, Canada	Hunter, M.L.| Frei, R.J.| Strachan, I.B.| Strack, M.	2024	Journal of Geophysical Research: Biogeosciences
Oxocarbon Acids and their Derivatives in Biological and Medicinal Chemistry	Ratto, A.| Honek, J.F.	2024	Current Medicinal Chemistry
Synthesis and characterization of coffee husk extract (CHE)-capped ZnO nanoparticles and their antimicrobial activity	Tsegaye, G.| Kiflie, Z.| Mekkonnen, T.H.| Jida, M.	2024	Biomass Conversion and Biorefinery
Impact of freeze-thaw cycles on greenhouse gas emissions in marginally productive agricultural land under different perennial bioenergy crops	Osei, A.K.| Rezanezhad, F.| Oelbermann, M.	2024	Journal of Environmental Management
Soil carbon dynamics in perennial biomass crops on marginally productive cropland in southern Canada	Osei, A.K.| Thevathasan, N.V.| Oelbermann, M.	2024	Geoderma Regional
A flow alignment-informed method for compartmental modelling	Vasile, A.A.| Aucoin, M.G.| Budman, H.| Abukhdeir, N.M.	2024	Computers and Chemical Engineering
A coupled metabolic flux/compartmental hydrodynamic model for large-scale aerated bioreactors	Promma, I.| Aucoin, M.G.| Abukhdeir, N.M.| Budman, H.	2024	Computers and Chemical Engineering

Title	Authors	Year	Journal or Conference
Comammox Nitrospira among dominant ammonia oxidizers within aquarium biofilter microbial communities	McKnight, M.M. | Neufeld, J.D.	2024	Applied and Environmental Microbiology
Microbial communities change along the 300 km length of the Grand River for extreme high-and low-flow regimes	Virgin, T.L. | Sonthiphand, P. | Coyotzi, S. | Hall, M.W. | Venkiteswaran, J.J. | Elgood, R.J. | Schiff, S.L. | Neufeld, J.D.	2024	Canadian Journal of Microbiology
Temporal, spatial and space–time distribution of infections caused by five major enteric pathogens, Ontario, Canada, 2010–2017	John, P. | Varga, C. | Cooke, M. | Majowicz, S.E.	2024	Zoonoses and Public Health
Antiviral discovery in toxic cyanobacteria: Low hanging fruit in the age of pandemics	Zheng, S. | Lee, V. | Meza-Padilla, I. | Nissimov, J.I.	2024	Journal of Phycology
Proteome partitioning constraints in long-term laboratory evolution	Mori, M. | Patsalo, V. | Euler, C. | Williamson, J.R. | Scott, M.	2024	Nature Communications
The ever-changing tree of life	Hug, L.A.	2024	Nature Microbiology
Crystallization and performance evolution of PHBV nanocomposites through annealing: The role of surface modification of CNCs	Esmizadeh, E. | Gupta, A. | Asrat, S. | Mekkonnen, T.H.	2024	Polymer
Structural models predict a significantly higher binding affinity between the NblA protein of cyanophage Ma-LMM01 and the phycocyanin of Microcystis aeruginosa NIES-298 compared to the host homolog	Meza-Padilla, I. | Mcconkey, B.J. | Nissimov, J.I.	2024	Virus Evolution
Effect of pro-oxidants on the aerobic biodegradation, disintegration, and physio-mechanical properties of compostable polymers	Ataeian, P. | Trinh, B.M. | Mekkonnen, T.H.	2024	Journal of Applied Polymer Science
Biobased residues sustain crop productivity and soil health in a maize–soybean rotation	Badewa, E.A. | Yeung, C.C. | Whalen, J.K. | Oelbermann, M.	2024	Soil Use and Management
Reconstructing SARS-CoV-2 lineages from mixed wastewater sequencing data	Ellmen, I. | Overton, A.K. | Knapp, J.J. | Nash, D. | Ho, H. | Hungwe, Y. | Prasla, S. | Nissimov, J.I. | Charles, T.C.	2024	Scientific Reports
Molecular Characterization of the Iron-Containing Alcohol Dehydrogenase from the Extremely Thermophilic Bacterium Pseudothermotoga hypogea	Hao, L. | Ayinla, Z. | Ma, K.	2024	Microorganisms

Title	Authors	Year	Journal or Conference
Framework to Quantify Uncertainty in Microplastic Concentrations in Wastewaters and Sludges Incorporating Analytical Recovery Information into Data Analysis	Zhu, Z.| Schmidt, P.J.| Parker, W.J.| Emelko, M.B.	2024	Analytical Chemistry
Revealing the Mysteries of Population Mobility Amid the COVID-19 Pandemic in Canada: Comparative Analysis With Internet of Things–Based Thermostat Data and Google Mobility Insights	Sahu, K.S.| Dubin, J.A.| Majowicz, S.E.| Liu, S.| Morita, P.P.	2024	JMIR Public Health and Surveillance
Fate of 15 PFAS in Two Full-Scale Wastewater Sludge-Handling Systems: An Interstage Mass Balance Analysis	Ozelcaglayan, A.C.| Pham, A.L.| Parker, W.J.	2024	ACS ES and T Water
A novel alcohol dehydrogenase in the hyperthermophilic crenarchaeon Hyperthermus butylicus	Tse, C.| Ma, K.	2024	mLife
Hydrogel-based photobioreactor for Solid-State cultivation of Chlorella vulgaris	Rasmussen, N.| Mohieddin Abukhdeir, N.| Ward, V.C.A.	2024	Bioresource Technology
Occupational pressures of frontline workers enforcing COVID-19 pandemic measures in Ontario and Quebec, Canada	Hopwood, P.| MacEachen, E.| Coté, D.| Meyer, S.B.| Majowicz, S.| Hyun, A.-T.| Crouch, M.K.| Amoako, J.| Jahangir, Y.T.| Correal, A.L.| Ilic, A.	2024	Work (Reading, Mass.)
Discovery of a glyphosate oxidase in nature	Ma, M.| Ardalan, A.| Van Dyk, A.| Charles, T.C.| Horsman, G.P.	2024	FEMS Microbiology Letters
Do linear clearings in boreal peatlands recover? Comparing taxonomic, phylogenetic, and functional plant diversity	Goud, E.M.| Davidson, S.J.| Dabros, A.| Kleinke, K.| Schmidt, M.A.| Strack, M.	2024	Botany
Heterologous expression of NoxA confers aerotolerance in Clostridium sporogenes	Sadr, S.| Zargar, B.| Perez, J.| Aucoin, M.G.| Ingalls, B.	2024	Biotechnology Journal
Synthetic biology education and pedagogy: a review of evolving practices in a growing discipline	Menard, J.| Diep, P.| Sheikh, F.| Escobar, A.| Dykstra, C.B.| Sajtovich, V.A.| Ahmadi, A.| Bodyreva, E.| Boucinha, A.| Chandrasekharan, S.| Duan, J.| Emond, C.| Lu, T.| McLean, I.| Morse, L.| Serra, D.| Stancescu, A.| Suresh, S.| Ingalls, B.P.	2024	Frontiers in Education
Production and Characterization of Biopolymer from Food Waste Using Pseudomonas putida	Chandra, R.| Mekkonnen, T.H.| Charles, T.C.| Juntupally, S.| Aghasa, A.| Lee, H.-S.	2024	ACS ES and T Engineering

Title	Authors	Year	Journal or Conference
Genomic surveillance of Canadian airport wastewater samples allows early detection of emerging SARS-CoV-2 lineages	Overton, A.K. | Knapp, J.J. | Lawal, O.U. | Gibson, R. | Fedynak, A.A. | Adebiyi, A.I. | Maxwell, B. | Cheng, L. | Bee, C. | Qasim, A. | Atanas, K. | Payne, M. | Stuart, R. | Fleury, M.D. | Knox, N.C. | Nash, D. | Hungwe, Y.C. | Prasla, S.R. | Ho, H. | Agboola, S.O. | Kwon, S.-H. | Naik, S. | Parreira, V.R. | Rizvi, F. | Precious, M.J. | Thomas, S. | Zambrano, M. | Fang, V. | Gilliland, E. | Varia, M. | Horn, M. | Landgraff, C. | Arts, E.J. | Goodridge, L. | Becker, D. | Charles, T.C.	2024	Scientific Reports
A widespread accessory protein family diversifies the effector repertoire of the type VI secretion system spike	Colautti, J. | Tan, H. | Bullen, N.P. | Thang, S.S. | Hackenberger, D. | Doxey, A.C. | Whitney, J.C.	2024	Nature Communications
Impact of organic matter constituents on phosphorus recovery from CPR sludges	Alnimer, A.A. | Smith, D.S. | Parker, W.J.	2024	Water Environment Research
Metatranscriptomic rna-seq data analysis of virus-infected host cells	Mazen, N.A. | Luc, J. | Lobb, B. | Hirota, J.A. | Banerjee, A. | Doxey, A.C.	2024	Methods in Molecular Biology
An acidic loop in the forkhead-associated domain of the yeast meiosis-specific kinase Mek1 interacts with a specific motif in a subset of Mek1 substrates	Weng, Q. | Wan, L. | Straker, G.C. | Deegan, T.D. | Duncker, B.P. | Neiman, A.M. | Luk, E. | Hollingsworth, N.M.	2024	Genetics
High-Level Bio-Based Production of Coproporphyrin in Escherichia coli	Arab, B. | Westbrook, A. | Moo-Young, M. | Liu, Y. | Chou, C.P.	2024	Fermentation
Carbon Stocks and Fluxes From a Boreal Conifer Swamp: Filling a Knowledge Gap for Understanding the Boreal C Cycle	Davidson, S.J. | Davies, M.A. | Wegener, E. | Claussen, S. | Schmidt, M. | Peacock, M. | Strack, M.	2024	Journal of Geophysical Research: Biogeosciences
Hybrid machine learning for scale-up of biomass production using photobioreactors	Sivaram, A. | Mehrdadfar, A. | Greco, L. | Euler, C. | Mansouri, S.S.	2024	Computer Aided Chemical Engineering
Riparian vegetation influences aquatic greenhouse gas production in an agricultural landscape	Hundal, H. | Thevathasan, N.V. | Oelbermann, M.	2024	Ecological Engineering
An initial assessment of winter microclimatic conditions in response to seismic line disturbance in a forested peatland	Bayatvarkeshi, M. | Ketcheson, S. | Weiland, L. | Strack, M.	2024	Hydrological Processes

Title	Authors	Year	Journal or Conference
A First Assessment of Greenhouse Gas Emissions From Agricultural Peatlands in Canada: Evaluation of Climate Change Mitigation Potential	Strack, M.| Bona, K.A.| Liang, C.	2024	Wiley Interdisciplinary Reviews: Climate Change
Concepts and criteria defining emerging microbiome applications	Kostic, T.| Schloter, M.| Arruda, P.| Berg, G.| Charles, T.C.| Cotter, P.D.| Kiran, G.S.| Lange, L.| Maguin, E.| Meisner, A.| van Overbeek, L.| Sanz, Y.| Sarand, I.| Selvin, J.| Tsakalidou, E.| Smidt, H.| Wagner, M.| Sessitsch, A.	2024	Microbial Biotechnology
Something old, something new: Ongoing revelations within the Faynan Landscape	Dolphin, A.E.| Adams, R.B.	2024	Palestine Exploration Quarterly
SARS-CoV-2 burden on the floor was associated with COVID-19 cases and outbreaks in two acute care hospitals: A prospective cohort study	Fralick, M.| Moggridge, J.A.| Wiebe, M.| Castellani, L.| McGeer, A.| Feenstra, B.| Hinz, A.| Hicks, A.M.A.| Hug, L.A.| Wong, A.| Van Bakel, T.| Abeygunawardena, S.| Burhunduli, T.| Mejbel, H.S.| Kassen, R.| Thampi, N.| MacFadden, D.| Nott, C.	2024	Infection Control and Hospital Epidemiology
Probing Baculovirus Vector Gene Essentiality for Foreign Gene Expression Using a CRISPR-Cas9 System	Chakraborty, M.| Powichrowski, J.| Bruder, M.R.| Nielsen, L.| Sung, C.| Boegel, S.J.| Aucoin, M.G.	2024	Methods in Molecular Biology
COVID-19 severity gradient differentially dysregulates clinically relevant drug processing genes in nasopharyngeal swab samples	Nwabufo, C.K.| Luc, J.| McGeer, A.| Hirota, J.A.| Mubareka, S.| Doxey, A.C.| Moraes, T.J.	2024	British Journal of Clinical Pharmacology
A benchmarked comparison of software packages for time-lapse image processing of monolayer bacterial population dynamics	Ahmadi, A.| Courtney, M.| Ren, C.| Ingalls, B.	2024	Microbiology Spectrum
A Pipeline for Calibrating Agent-Based Models of Microbial Populations: From Image Collection to Model Parameterization	Ahmadi, A.| Yip, A.| Chalaturnyk, J.| Aucoin, M.G.| Ingalls, B.P.	2024	IFAC-PapersOnLine
Pilot-scale evaluation of cascade anaerobic digestion of mixed municipal wastewater treatment sludges	Zhu, Y.| Yu, D.| Koornneef, E.| Parker, W.J.	2024	Water Environment Research
Canadian beach cohort study: protocol of a prospective study to assess the burden of recreational water illness	Young, I.| Desta, B.N.| Sanchez, J.J.| Majowicz, S.E.| Edge, T.A.| Elton, S.| Pearl, D.L.| Brooks, T.| Nesbitt,	2024	BMC Public Health

Title	Authors	Year	Journal or Conference
	A. | Patel, M. | Schwandt, M. | Lyng, D. | Krupa, B. | Schellhorn, H.E. | Montgomery, E. | Tustin, J.		
Legacy copper/nickel mine tailings potentially harbor novel iron/sulfur cycling microorganisms within highly variable communities	Chen, M. | Grégoire, D.S. | Bain, J.G. | Blowes, D.W. | Hug, L.A.	2024	Applied and Environmental Microbiology
No two clones are alike: characterization of heterologous subpopulations in a transgenic cell line of the model diatom Phaeodactylum tricornutum	Diaz-Garza, A.M. | Merindol, N. | dos Santos, K.C.G. | Lavoie-Marchand, F. | Ingalls, B. | Desgagné-Penix, I.	2024	Microbial Cell Factories
Transitioning to soil health and carbon sequestration with agroforestry and perennial crop systems	Oelbermann, M. | Chang, S.X. | Pulleman, M. | Whalen, J.K.	2024	Geoderma Regional
Synthesis and characterization of coffee husk extract (CHE)-capped Fe3O4/PU/ZnO nanocomposites with antimicrobial activity	Tsegaye, G. | Kiflie, Z. | Mekkonnen, T.H. | Jida, M.	2024	Biomass Conversion and Biorefinery
Multiplexed Target Profiling with Integrated Chemical Genomics and Chemical Proteomics	Yang, Y. | Tse, Y.-S. | Zhang, Q. | Wong, K.-Y. | Yang, C. | Yang, Y. | Li, S. | Lau, K.-W. | Charles, T.C. | Lam, T.C. | Zhao, Q.	2024	Journal of Medicinal Chemistry
Degradation of polyethylene terephthalate (PET) plastics by wastewater bacteria engineered via conjugation	Yip, A. | McArthur, O.D. | Ho, K.C. | Aucoin, M.G. | Ingalls, B.P.	2024	Microbial Biotechnology
Unraveling the functional dark matter through global metagenomics	Pavlopoulos, G.A. | Baltoumas, F.A. | Liu, S. | Hug, L.A. | et al.	2023	Nature
Microbiome Interconnectedness throughout Environments with Major Consequences for Healthy People and a Healthy Planet	Sessitsch, A. | Wakelin, S. | Schloter, M. | Maguin, E. | Cernava, T. | Champomier-Verges, M.-C. | Charles, T.C. | Cotter, P.D. | Ferrocino, I. | Kriaa, A. | Lebre, P. | Cowan, D. | Lange, L. | Kiran, S. | Markiewicz, L. | Meisner, A. | Olivares, M. | Sarand, I. | Schelkle, B. | Selvin, J. | Smidt, H. | van Overbeek, L. | Berg, G. | Cocolin, L. | Sanz, Y. | Fernandes, W.L. | Liu, S.J. | Ryan, M. | Singh, B. | Kostic, T.	2023	Microbiology and Molecular Biology Reviews
Shaping bacterial gene expression by physiological and proteome allocation constraints	Scott, M. | Hwa, T.	2023	Nature Reviews Microbiology

Title	Authors	Year	Journal or Conference
A comparative investigation of seed storage protein fractions: The synergistic impact of molecular properties and composition on anisotropic structuring	Nasrollahzadeh, F. | Roman, L. | Skov, K. | Jakobsen, L.M.A. | Trinh, B.M. | Tsochatzis, E.D. | Mekkonnen, T. | Corredig, M. | Dutcher, J.R. | Martinez, M.M.	2023	Food Hydrocolloids
β-Cyclodextrin functionalized adsorbents for removal of organic micropollutants from water	Ozelcaglayan, E.D. | Parker, W.J.	2023	Chemosphere
Production of polyhydroxyalkanoate (PHA) copolymer from food waste using mixed culture for carboxylate production and Pseudomonas putida for PHA synthesis	Chandra, R. | Thakor, A. | Mekkonnen, T.H. | Charles, T.C. | Lee, H.-S.	2023	Journal of Environmental Management
Decoding a cryptic mechanism of metronidazole resistance among globally disseminated fluoroquinolone-resistant Clostridioides difficile	Olaitan, A.O. | Dureja, C. | Youngblom, M.A. | Topf, M.A. | Shen, W.-J. | Gonzales-Luna, A.J. | Deshpande, A. | Hevener, K.E. | Freeman, J. | Wilcox, M.H. | Palmer, K.L. | Garey, K.W. | Pepperell, C.S. | Hurdle, J.G.	2023	Nature Communications
Natural Antioxidant and Antimicrobial Agents and Processing Technologies for the Design of Active Food Packaging Polymers	Chang, B.P. | Trinh, B.M. | Tadele, D.T. | Bandara, N. | Mekkonnen, T.H.	2023	Polymer Reviews
Simultaneous nitrification, denitrification, and phosphorus removal from municipal wastewater at low temperature	Bai, X. | McKnight, M.M. | Neufeld, J.D. | J. Parker, W.	2023	Bioresource Technology
A Universal Strategy to Promote Secretion of G+/G- Bacterial Extracellular Vesicles and Its Application in Host Innate Immune Responses	Liu, Y. | Chen, J. | Raj, K. | Baerg, L. | Nathan, N. | Philpott, D.J. | Mahadevan, R.	2023	ACS Synthetic Biology
Comparative analysis of adenylate isopentenyl transferase genes in plant growth-promoting bacteria and plant pathogenic bacteria	Wei, X. | Moreno-Hagelsieb, G. | Glick, B.R. | Doxey, A.C.	2023	Heliyon
Expression of Interleukin-1β protein in vitro, ex vivo and in vivo salmonid models	Frenette, A.P. | Rodríguez-Ramos, T. | Zanuzzo, F. | Ramsay, D. | Semple, S.L. | Soullière, C. | Rodríguez-Cornejo, T. | Heath, G. | McKenzie, E. | Iwanczyk, J. | Bruder, M. | Aucoin, M.G. | Gamperl, A.K. | Dixon, B.	2023	Developmental and Comparative Immunology

Title	Authors	Year	Journal or Conference
Hydrologic and Landscape Controls on Dissolved Organic Matter Composition Across Western North American Arctic Lakes	Kurek, M.R.| Garcia-Tigreros, F.| Wickland, K.P.| Frey, K.E.| Dornblaser, M.M.| Striegl, R.G.| Niles, S.F.| McKenna, A.M.| Aukes, P.J.K.| Kyzivat, E.D.| Wang, C.| Pavelsky, T.M.| Smith, L.C.| Schiff, S.L.| Butman, D.| Spencer, R.G.M.	2023	Global Biogeochemical Cycles
Duration of extraction determines CO2 and CH4 emissions from an actively extracted peatland in eastern Quebec, Canada	Clark, L.| Strachan, I.B.| Strack, M.| Roulet, N.T.| Knorr, K.-H.| Teickner, H.	2023	Biogeosciences
Closed-loop operation of a simulated recirculating aquaculture system with an integrated application of nonlinear model predictive control and moving horizon estimation	Kamali, S.| Ward, V.C.A.| Ricardez-Sandoval, L.	2023	Computers and Electronics in Agriculture
Leveraging deep learning for automatic recognition of microplastics (MPs) via focal plane array (FPA) micro-FT-IR imaging	Zhu, Z.| Parker, W.| Wong, A.	2023	Environmental Pollution
A comparative analysis of the partitioning behaviour of SARS-CoV-2 RNA in liquid and solid fractions of wastewater	Breadner, P.R.| Dhiyebi, H.A.| Fattahi, A.| Srikanthan, N.| Hayat, S.| Aucoin, M.G.| Boegel, S.J.| Bragg, L.M.| Craig, P.M.| Xie, Y.| Giesy, J.P.| Servos, M.R.	2023	Science of the Total Environment
Functionality of methane cycling microbiome during methane flux hot moments from riparian buffer systems	Obregon, D.| Mafa-Attoye, T.G.| Baskerville, M.| Mitter, E.K.| de Souza, L.F.| Oelbermann, M.| Thevathasan, N.V.| Tsai, S.M.| Dunfield, K.E.	2023	Science of the Total Environment
Microbial methane cycling in a landfill on a decadal time scale	Grégoire, D.S.| George, N.A.| Hug, L.A.	2023	Nature Communications
Compost and biosolids increase long-term soil organic carbon stocks	Badewa, E.A.| Yeung, C.C.| Whalen, J.K.| Oelbermann, M.	2023	Canadian Journal of Soil Science
Phosphorus release and recovery by reductive dissolution of chemically precipitated phosphorus from simulated wastewater	Alnimer, A.A.| Smith, D.S.| Parker, W.J.	2023	Chemosphere
Interaction of operating HRT and temperature on fouling of tertiary membranes treating municipal wastewater	Tao, C.| Parker, W.| Bérubé, P.	2023	Science of the Total Environment

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Reestablishment of peatland vegetation following surface leveling of decommissioned in situ oil mining infrastructures	Lemmer, M. | Xu, B. | Strack, M. | Rochefort, L.	2023	Restoration Ecology
Factors impacting antimicrobial resistance in the South East Asian food system and potential places to intervene: A participatory, one health study	Lambraki, I.A. | Chadag, M.V. | Cousins, M. | Graells, T. | Léger, A. | Henriksson, P.J.G. | Troell, M.F. | Harbarth, S. | Wernli, D. | Jørgensen, P.S. | Carson, C.A. | Parmley, E.J. | Majowicz, S.E.	2023	Frontiers in Microbiology
Microbially mediated carbon dioxide removal for sustainable mining	McCutcheon, J. | Power, I.M.	2023	PLoS Biology
Bioavailability of Macro and Micronutrients Across Global Topsoils: Main Drivers and Global Change Impacts	Ochoa-Hueso, R. | Delgado-Baquerizo, M. | Risch, A.C. | Strack, M. | et al.	2023	Global Biogeochemical Cycles
Antiviral and Antibacterial Cold Spray Coating Application on Rubber Substrate, Disruption in Disease Transmission Chain	Saha, D.C. | Boegel, S.J. | Tanvir, S. | Nogueira, C.L. | Aucoin, M.G. | Anderson, W.A. | Jahed, H.	2023	Journal of Thermal Spray Technology
Evaluation of Virus-Free Manufacture of Recombinant Proteins Using CRISPR-Mediated Gene Disruption in Baculovirus-Infected Insect Cells	Bruder, M.R. | Aucoin, M.G.	2023	Vaccines
Ancient Clostridium DNA and variants of tetanus neurotoxins associated with human archaeological remains	Hodgins, H.P. | Chen, P. | Lobb, B. | Wei, X. | Tremblay, B.J.M. | Mansfield, M.J. | Lee, V.C.Y. | Lee, P.-G. | Coffin, J. | Duggan, A.T. | Dolphin, A.E. | Renaud, G. | Dong, M. | Doxey, A.C.	2023	Nature Communications
Biological Filtration is Resilient to Wildfire Ash-Associated Organic Carbon Threats to Drinking Water Treatment	Blackburn, E.A.J. | Dickson-Anderson, S.E. | Anderson, W.B. | Emelko, M.B.	2023	ACS ES and T Water
The analysis of per- and polyfluoroalkyl substances in wastewater sludges and biosolids: which adsorbents should be used for the cleanup of extracts?	Ozelcaglayan, A.C. | Parker, W.J. | Pham, A.L.	2023	Environmental Science: Water Research and Technology
MT-MAG: Accurate and interpretable machine learning for complete or partial taxonomic assignments of metagenomeassembled genomes	Li, W. | Kari, L. | Yu, Y. | Hug, L.A.	2023	PLoS ONE

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Insight into direct phosphorus release from simulated wastewater ferric sludge: Influence of physiochemical factors	Alnimer, A.A. | Smith, D.S. | Parker, W.J.	2023	Journal of Environmental Chemical Engineering
Scope and applicability of social–ecological resilience to antimicrobial resistance	Wernli, D. | Søgaard Jørgensen, P. | Parmley, E.J. | Majowicz, S.E. | Lambraki, I. | Carson, C.A. | Cousins, M. | Graells, T. | Henriksson, P.J.G. | Léger, A. | Harbarth, S. | Troell, M.	2023	The Lancet Planetary Health
Genomic and transcriptomic characterization of delta SARS-CoV-2 infection in free-ranging white-tailed deer (Odocoileus virginianus)	Kotwa, J.D. | Lobb, B. | Massé, A. | Gagnier, M. | Aftanas, P. | Banerjee, A. | Banete, A. | Blais-Savoie, J. | Bowman, J. | Buchanan, T. | Chee, H.-Y. | Kruczkiewicz, P. | Nirmalarajah, K. | Soos, C. | Vernygora, O. | Yip, L. | Lindsay, L.R. | McGeer, A.J. | Maguire, F. | Lung, O. | Doxey, A.C. | Pickering, B. | Mubareka, S.	2023	iScience
Functional Profiling and Evolutionary Analysis of a Marine Microalgal Virus Pangenome	Lobb, B. | Shapter, A. | Doxey, A.C. | Nissimov, J.I.	2023	Viruses
Is scientific evidence enough? Using expert opinion to fill gaps in data in antimicrobial resistance research	Cousins, M. | Parmley, E.J. | Greer, A.L. | Neiterman, E. | Lambraki, I.A. | Graells, T. | Léger, A. | Henriksson, P.J.G. | Troell, M. | Wernli, D. | Jørgensen, P.S. | Carson, C.A. | Majowicz, S.E.	2023	PLoS ONE
Cannabis smoke suppresses antiviral immune responses to influenza A in mice	Milad, N. | Fantauzzi, M.F. | McGrath, J.J.C. | Cass, S.P. | Thayaparan, D. | Wang, P. | Afkhami, S. | Aguiar, J.A. | Ask, K. | Doxey, A.C. | Stampfli, M.R. | Hirota, J.A.	2023	ERJ Open Research
Limosilactobacillus reuteri administration alters the gut-brain-behavior axis in a sex-dependent manner in socially monogamous prairie voles	Donovan, M. | Mackey, C.S. | Lynch, M.D.J. | Platt, G.N. | Brown, A.N. | Washburn, B.K. | Trickey, D.J. | Curtis, J.T. | Liu, Y. | Charles, T.C. | Wang, Z. | Jones, K.M.	2023	Frontiers in Microbiology
Exploring the effects of one-time biochar application with low dosage on soil health in temperate climates	Jiang, R.W. | Mechler, M.A. | Oelbermann, M.	2023	Soil Security
Predicting changes in soil organic carbon after a low dosage and one-time addition of biochar blended with manure and nitrogen fertilizer	Oelbermann, M. | Jiang, R.W. | Mechler, M.A.	2023	Frontiers in Soil Science

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Thermodynamic Overview of Bioconjugation Reactions Pertinent to Lysine and Cysteine Peptide and Protein Residues	Lopandic, M.| Merza, F.| Honek, J.F.	2023	Compounds
Evaluation of pulsed xenon UV irradiation on inactivation of Listeria monocytogenes on stainless-steel surfaces	Yasoubi, N.| Anderson, W.A.| Ward, V.C.A.	2023	LWT
Genetic Engineering of Acidithiobacillus ferridurans Using CRISPR Systems To Mitigate Toxic Release in Biomining	Chen, J.| Liu, Y.| Mahadevan, R.	2023	Environmental Science and Technology
Estimating the Under-ascertainment of COVID-19 cases in Toronto, Ontario, March to May 2020	Desta, B.N.| Ota, S.| Gournis, E.| Pires, S.M.| Greer, A.L.| Dodd, W.| Majowicz, S.E.	2023	Journal of Public Health Research
Production of Astaxanthin Using CBFD1/HFBD1 from Adonis aestivalis and the Isopentenol Utilization Pathway in Escherichia coli	Roth, J.H.| Ward, V.C.A.	2023	Bioengineering
Exploring the factors that contribute to the successful implementation of antimicrobial resistance interventions: a comparison of high-income and low-middle-income countries	Graells, T.| Lambraki, I.A.| Cousins, M.| Léger, A.| Henriksson, P.J.G.| Troell, M.| Carson, C.A.| Parmley, E.J.| Majowicz, S.E.| Wernli, D.| Jørgensen, P.S.	2023	Frontiers in Public Health
Kinetic modelling of β-cell metabolism reveals control points in the insulin-regulating pyruvate cycling pathways	Rahul, R.| Stinchcombe, A.R.| Joseph, J.W.| Ingalls, B.	2023	IET Systems Biology
Methane Cycling Microbial Community Characteristics: Comparing Natural, Actively Extracted, Restored and Unrestored Boreal Peatlands	Bieniada, A.| Hug, L.A.| Parsons, C.T.| Strack, M.	2023	Wetlands
CRISPR-resolved virus-host interactions in a municipal landfill include non-specific viruses, hyper-targeted viral populations, and interviral conflicts	George, N.A.| Hug, L.A.	2023	Scientific Reports
Managing the unknown or the art of preventing SARS-CoV-2 infection in workplaces in a context of evolving science, precarious employment, and	Côté, D.| MacEachen, E.| Huynh, A.-T.| León, A.| Laberge, M.| Meyer, S.| Majowicz, S.| Amoako, J.| Jahangir, Y.| Dubé, J.	2023	Frontiers in Public Health

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communication barriers. A qualitative situational analysis in Quebec and Ontario			
A sensitive assay for scrutiny of Autographa californica multiple nucleopolyhedrovirus genes using CRISPR-Cas9	Bruder, M.R. | Aucoin, M.G.	2023	Applied Microbiology and Biotechnology
Extraction of a Docosahexaenoic Acid-Rich Oil from Thraustochytrium sp. Using a Hydrophobic Ionic Liquid	Zhang, Y. | Ward, V. | Meramo, S. | Dennis, D. | Plechkova, N.V. | Armenta, R.E. | Rehmann, L.	2023	ACS Sustainable Chemistry and Engineering
Phylogenomic Analysis of 155 Helminth Species Reveals Widespread Absence of Oxygen Metabolic Capacity	Collington, E. | Lobb, B. | Mazen, N.A. | Doxey, A.C. | Glerum, D.M.	2023	Genome Biology and Evolution
A Machine Learning Framework Identifies Plastid-Encoded Proteins Harboring C3and C4Distinguishing Sequence Information	Yogadasan, N. | Doxey, A.C. | Chuong, S.D.X.	2023	Genome Biology and Evolution
Molecular Engineering of E. coli Bacterioferritin: A Versatile Nanodimensional Protein Cage	van der Ven, A.M. | Gyamfi, H. | Suttisansanee, U. | Ahmad, M.S. | Su, Z. | Taylor, R.M. | Poole, A. | Chiorean, S. | Daub, E. | Urquhart, T. | Honek, J.F.	2023	Molecules
Advances in wetland hydrology: the Canadian contribution over 75 years	Price, J.S. | Sutton, O.F. | McCarter, C.P.R. | Quinton, W.L. | Waddington, J.M. | Whittington, P.N. | Strack, M. | Petrone, R.M.	2023	Canadian Water Resources Journal
Yes, they can! Comparing foodborne illness estimates, and the need for greater transparency	Scallan Walter, E. | Kirk, M.D. | Majowicz, S.E.	2023	BMJ Open Gastroenterology
DNA-, RNA-, and Protein-Based Stable-Isotope Probing for High-Throughput Biomarker Analysis of Active Microorganisms	Jameson, E. | Taubert, M. | Angel, R. | Coyotzi, S. | Chen, Y. | Eyice, Ö. | Schäfer, H. | Murrell, J.C. | Neufeld, J.D. | Dumont, M.G.	2023	Methods in Molecular Biology
Isolation of Genes Encoding Carbon Metabolism Pathways from Complex Microbial Communities	Thakor, A. | Cheng, J. | Charles, T.C.	2023	Methods in Molecular Biology
A literature-based comparison of embodied GHG emissions of forced main sewer additives with potential reductions in methane generation	Parker, W.J. | Walton, J.R.	2023	Water Practice and Technology
Agrobacterium tumefaciens-Mediated Genetic Engineering of Green Microalgae, Chlorella vulgaris	Roushan, M.R. | Chen, C. | Ahmadi, P. | Ward, V.C.A.	2023	Journal of Visualized Experiments

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Patterns of enteric infections in a population-wide cohort study of sequelae, British Columbia, Canada	Gohari, M.R. | Taylor, M. | Mackinnon, M.C. | Panagiotoglou, D. | Galanis, E. | Kaplan, G.G. | Cook, R.J. | Patrick, D.M. | Ethelberg, S. | Majowicz, S.E.	2023	Epidemiology and Infection
Nitrogen and Phosphorus Treatment Can Be Sustainable During on-Site Wastewater Disposal	Robertson, W.D. | Elgood, R.J. | Van Stempvoort, D.R. | Brown, S.J. | Schiff, S.L.	2023	Groundwater
Microbes 'R' us	Neufeld, J.D.	2023	Environmental Microbiology
Tacking Fugitive Methane Emissions at WRRFs – Global Lessons	Lake, A. | Scheutz, C. | Beelen, B. | Nielsen, P.H. | Shen, E. | Vellacott, A. | Fredenslund, A.M. | Parker, W. | Kraemer, J.	2023	96th Annual Water Environment Federation Technical Exhibition and Conference
Genomic classification and antimicrobial resistance profiling of Streptococcus pneumoniae and Haemophilus influenza isolates associated with paediatric otitis media and upper respiratory infection	Lobb, B. | Lee, M.C. | McElheny, C.L. | Doi, Y. | Yahner, K. | Hoberman, A. | Martin, J.M. | Hirota, J.A. | Doxey, A.C. | Shaikh, N.	2023	BMC Infectious Diseases
Filter operation effects on plant-scale microbial risk: Opportunities for enhanced treatment performance	de Brito Cruz, D. | Brown, T.J. | Jin, C. | Kundert, K.L. | Ruecker, N.J. | Ballantyne, L. | Schmidt, P.J. | Anderson, W.B. | Emelko, M.B.	2023	AWWA Water Science
Monod parameterization and competition at low iron among freshwater cyanobacteria and chlorophytes	Shah, P. | McCabe, S.K. | Venkiteswaran, J.J. | Molot, L.A. | Schiff, S.L.	2023	Hydrobiologia
A critical review of microplastic degradation and material flow analysis towards a circular economy	Cholewinski, A. | Dadzie, E. | Sherlock, C. | Anderson, W.A. | Charles, T.C. | Habib, K. | Young, S.B. | Zhao, B.	2022	Environmental Pollution
Current State of Microplastic Pollution Research Data: Trends in Availability and Sources of Open Data	Jenkins, T. | Persaud, B.D. | Cowger, W. | Szigeti, K. | Roche, D.G. | Clary, E. | Slowinski, S. | Lei, B. | Abeynayaka, A. | Nyadjro, E.S. | Maes, T. | Thornton Hampton, L. | Bergmann, M. | Aherne, J. | Mason, S.A. | Honek, J.F. | Rezanezhad, F. | Lusher, A.L. | Booth, A.M. | Smith, R.D.L. | Van Cappellen, P.	2022	Frontiers in Environmental Science
Nitrogen removal pathways during simultaneous nitrification, denitrification, and phosphorus removal under low temperature and dissolved oxygen conditions	Bai, X. | McKnight, M.M. | Neufeld, J.D. | Parker, W.J.	2022	Bioresource Technology

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Warming combined with experimental eutrophication intensifies lake phytoplankton blooms	Salk, K.R. | Venkiteswaran, J.J. | Couture, R.-M. | Higgins, S.N. | Paterson, M.J. | Schiff, S.L.	2022	Limnology and Oceanography
Genetic engineering of extremely acidophilic Acidithiobacillus species for biomining: Progress and perspectives	Chen, J. | Liu, Y. | Diep, P. | Mahadevan, R.	2022	Journal of Hazardous Materials
Metadata harmonization–Standards are the key for a better usage of omics data for integrative microbiome analysis	Cernava, T. | Rybakova, D. | Buscot, F. | Clavel, T. | McHardy, A.C. | Meyer, F. | Meyer, F. | Overmann, J. | Stecher, B. | Sessitsch, A. | Schloter, M. | Berg, G. | Arruda, P. | Bartzanas, T. | Kostic, T. | Brennan, P.I. | Biazotti, B.B. | Champomier-Verges, M.-C. | Charles, T. | Coakley, M. | Cotter, P. | Cowan, D. | D'Hondt, K. | Ferrocino, I. | Foterek, K. | Herrero-Corral, G. | Huitema, C. | Jansson, J. | Liu, S.-J. | Malloy, P. | Maguin, E. | Markiewicz, L. | Mcclure, R. | Moser, A. | Roovers, J. | Ryan, M. | Sarand, I. | Schelkle, B. | Meisner, A. | Schurr, U. | Selvin, J. | Tsakalidou, E. | Wagner, M. | Wakelin, S. | Wiczkowski, W. | Winkler, H. | Xiao, J. | Bunthof, C.J. | de Souza, R.S.C. | Sanz, Y. | Lange, L. | Smidt, H.	2022	Environmental Microbiomes
Production of recombinant and therapeutic proteins in microalgae	Banerjee, A. | Ward, V.	2022	Current Opinion in Biotechnology
Dynamic modeling of recirculating aquaculture systems: Effect of management strategies and water quality parameters on fish performance	Kamali, S. | Ward, V.C.A. | Ricardez-Sandoval, L.	2022	Aquacultural Engineering
Mechanisms and impact of antimicrobial resistance in Clostridioides difficile	Dureja, C. | Olaitan, A.O. | Hurdle, J.G.	2022	Current Opinion in Microbiology
Antimicrobial polymeric composites for high-touch surfaces in healthcare applications	Liu, M. | Bauman, L. | Nogueira, C.L. | Aucoin, M.G. | Anderson, W.A. | Zhao, B.	2022	Current Opinion in Biomedical Engineering
The unrecognized importance of carbon stocks and fluxes from swamps in Canada and the USA	Davidson, S.J. | Dazé, E. | Byun, E. | Hiler, D. | Kangur, M. | Talbot, J. | Finkelstein, S.A. | Strack, M.	2022	Environmental Research Letters

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Cloacimonadota metabolisms include adaptations in engineered environments that are reflected in the evolutionary history of the phylum	Johnson, L.A.| Hug, L.A.	2022	Environmental Microbiology Reports
Identification of TFPI as a receptor reveals recombination-driven receptor switching in Clostridioides difficile toxin B variants	Tian, S.| Xiong, X.| Zeng, J.| Wang, S.| Tremblay, B.J.-M.| Chen, P.| Chen, B.| Liu, M.| Chen, P.| Sheng, K.| Zeve, D.| Qi, W.| Breault, D.T.| Rodríguez, C.| Gerhard, R.| Jin, R.| Doxey, A.C.| Dong, M.	2022	Nature Communications
Bacterial genome reductions: Tools, applications, and challenges	LeBlanc, N.| Charles, T.C.	2022	Frontiers in Genome Editing
Biobased and compostable trilayer thermoplastic films based on poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) and thermoplastic starch (TPS)	Eslami, H.| Grady, M.| Mekkonnen, T.H.	2022	International Journal of Biological Macromolecules
SARS-CoV-2 detection from the built environment and wastewater and its use for hospital surveillance	Hinz, A.| Xing, L.| Doukhanine, E.| Hug, L.A.| Kassen, R.| Ormeci, B.| Kibbee, R.J.| Wong, A.| MacFadden, D.| Nott, C.	2022	Facets
Factors influencing antimicrobial resistance in the European food system and potential leverage points for intervention: A participatory, One Health study	Lambraki, I.A.| Cousins, M.| Graells, T.| Leger, A.| Henriksson, P.| Harbarth, S.| Troell, M.| Wernli, D.| Jørgensen, P.S.| Desbois, A.P.| Carson, C.A.| Parmley, E.J.| Majowicz, S.E.	2022	PLoS ONE
Ion-Exchange Treatment of Perfluorinated Carboxylic Acids in Water: Comparison of Polystyrenic and Polyacrylic Resin Structures and Impact of Sulfate on Their Performance	Rahman, M.F.| Anderson, W.B.| Peldszus, S.| Huck, P.M.	2022	ACS ES and T Water
Assessing the role of cold temperatures on irreversible membrane permeability of tertiary ultrafiltration treating municipal wastewater	Tao, C.| Parker, W.| Bérubé, P.	2022	Separation and Purification Technology
Deep reinforcement learning for optimal experimental design in biology	Treloar, N.J.| Braniff, N.| Ingalls, B.| Barnes, C.P.	2022	PLoS Computational Biology
Environmental Potential for Microbial 1,4-Dioxane Degradation Is Sparse despite Mobile Elements Playing a Role in Trait Distribution	Goff, K.L.| Hug, L.A.	2022	Applied and Environmental Microbiology

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Glutamine Metabolism Mediates Sensitivity to Respiratory Complex II Inhibition in Acute Myeloid Leukemia	Roma, A.| Tcheng, M.| Ahmed, N.| Walker, S.| Jayanth, P.| Minden, M.D.| Hope, K.| Nekkar Rao, P.P.| Luc, J.| Doxey, A.C.| Reisz, J.A.| Culp-Hill, R.| D'Alessandro, A.| Spagnuolo, P.A.	2022	Molecular Cancer Research
Endogenous CRISPR-Cas Systems in Group I Clostridium botulinum and Clostridium sporogenes Do Not Directly Target the Botulinum Neurotoxin Gene Cluster	Wentz, T.G.| Tremblay, B.J.M.| Bradshaw, M.| Doxey, A.C.| Sharma, S.K.| Sauer, J.-D.| Pellett, S.	2022	Frontiers in Microbiology
Growth-dependent heterogeneity in the DNA damage response in Escherichia coli	Jaramillo-Riveri, S.| Broughton, J.| McVey, A.| Pilizota, T.| Scott, M.| El Karoui, M.	2022	Molecular Systems Biology
Microbiome ethics, guiding principles for microbiome research, use and knowledge management	Lange, L.| Berg, G.| Cernava, T.| Champomier-Vergès, M.-C.| Charles, T.| Cocolin, L.| Cotter, P.| D'Hondt, K.| Kostic, T.| Maguin, E.| Makhalanyane, T.| Meisner, A.| Ryan, M.| Kiran, G.S.| de Souza, R.S.| Sanz, Y.| Schloter, M.| Smidt, H.| Wakelin, S.| Sessitsch, A.	2022	Environmental Microbiomes
Evaluation of the impact of SBR operating temperature and filtration temperature on fouling of membranes used for tertiary treatment	Tao, C.| Parker, W.| Bérubé, P.	2022	Separation and Purification Technology
Studying Factors Affecting Success of Antimicrobial Resistance Interventions through the Lens of Experience: A Thematic Analysis	Graells, T.| Lambraki, I.A.| Cousins, M.| Léger, A.| Lillepold, K.| Henriksson, P.J.G.| Troell, M.| Carson, C.A.| Parmley, E.J.| Majowicz, S.E.| Wernli, D.| Jørgensen, P.S.	2022	Antibiotics
Aquatic virus culture collection: an absent (but necessary) safety net for environmental microbiologists	Nissimov, J.I.| Campbell, C.N.| Probert, I.| Wilson, W.H.	2022	Applied Phycology
Strategies for production of hydrophobic compounds	Palage, A.M.| Ward, V.C.	2022	Current Opinion in Biotechnology
Graminoids vary in functional traits, carbon dioxide and methane fluxes in a restored peatland: Implications for modelling carbon storage	Goud, E.M.| Touchette, S.| Strachan, I.B.| Strack, M.	2022	Journal of Ecology

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Utility of Alternative Promoters for Foreign Gene Expression Using the Baculovirus Expression Vector System	Bruder, M.R. | Aucoin, M.G.	2022	Viruses
How mounds are made matters: seismic line restoration techniques affect peat physical and chemical properties throughout the peat profile	Kleinke, K. | Davidson, S.J. | Schmidt, M. | Xu, B. | Strack, M.	2022	Canadian Journal of Forest Research
Restoration of boreal peatland impacted by an in-situ oil sands well-pad 1: Vegetation response	Xu, B. | Rochefort, L. | Bird, M. | Khadka, B. | Strack, M.	2022	Restoration Ecology
Dissolved organic carbon affects the occurrence of deep chlorophyll peaks and zooplankton resource use and biomass	Tonin, J. | Sherbo, B. | Higgins, S.N. | Schiff, S.L. | Paterson, M.J.	2022	Freshwater Biology
Ensuring That Fundamentals of Quantitative Microbiology Are Reflected in Microbial Diversity Analyses Based on Next-Generation Sequencing	Schmidt, P.J. | Cameron, E.S. | Müller, K.M. | Emelko, M.B.	2022	Frontiers in Microbiology
Effect of Interphase Properties on Isothermal and Non-isothermal Crystallization Behavior of Poly(lactic acid)/Acetylated Starch Blends	Nasseri, R. | Moresoli, C. | Yu, A. | Yuan, Z. | Xu, C.C.	2022	ACS Omega
Governing Antimicrobial Resistance (AMR) in a Changing Climate: A Participatory Scenario Planning Approach Applied to Sweden in 2050	Lambraki, I.A. | Cousins, M. | Graells, T. | Léger, A. | Abdelrahman, S. | Desbois, A.P. | Gallagher, R. | Staaf Larsson, B. | Mattson, B. | Henriksson, P. | Troell, M. | Søgaard Jørgensen, P. | Wernli, D. | Carson, C.A. | Parmley, E.J. | Majowicz, S.E.	2022	Frontiers in Public Health
A probabilistic approach to the quantification of methane generation in sewer networks	Beelen, B. | Parker, W.	2022	Journal of Environmental Management
Incidence, Demographic, and Seasonal Risk Factors of Infections Caused by Five Major Enteric Pathogens, Ontario, Canada, 2010-2017	John, P. | Varga, C. | Cooke, M. | Majowicz, S.E.	2022	Foodborne Pathogens and Disease
Antiviral Activity of Contemporary Contact Lens Care Solutions against Two Human Seasonal Coronavirus Strains	Nogueira, C.L. | Boegel, S.J. | Shukla, M. | Ngo, W. | Jones, L. | Aucoin, M.G.	2022	Pathogens
Harnessing synthetic biology for sustainable biomining with Fe/S-oxidizing microbes	Chen, J. | Liu, Y. | Diep, P. | Mahadevan, R.	2022	Frontiers in Bioengineering and Biotechnology

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The impact of a rub and rinse regimen on removal of human coronaviruses from contemporary contact lens materials	Nogueira, C.L. | Boegel, S.J. | Shukla, M. | Ngo, W. | Jones, L. | Aucoin, M.G.	2022	Contact Lens and Anterior Eye
Systems engineering of Escherichia coli for n-butane production	Liu, Y. | Khusnutdinova, A. | Chen, J. | Crisante, D. | Batyrova, K. | Raj, K. | Feigis, M. | Shirzadi, E. | Wang, X. | Dorakhan, R. | Wang, X. | Stogios, P.J. | Yakunin, A.F. | Sargent, E.H. | Mahadevan, R.	2022	Metabolic Engineering
Intronic regulation of SARS-CoV-2 receptor (ACE2) expression mediated by immune signaling and oxidative stress pathways	Richard, D. | Muthuirulan, P. | Aguiar, J. | Doxey, A.C. | Banerjee, A. | Mossman, K. | Hirota, J. | Capellini, T.D.	2022	iScience
"From Protein Toxins to Applied Toxicological Testing" virtual workshop identifies the need for a bioinformatic framework to assess novel food protein safety	Bauman, P.A. | Doxey, A.C. | Eberini, I. | Islamovic, E. | Jungo, F. | Kessenich, C. | Kough, J. | Krishan, M. | Palazzolo, L. | Privalle, L. | Rodriguez, C.E. | Satchell, K.J.F. | Silvanovich, A. | Pereira Mouriès, L.	2022	Regulatory Toxicology and Pharmacology
A comparison of repeat cross-sectional and longitudinal results from the COMPASS study: design considerations for analysing surveillance data over time	Butler, A.E. | Battista, K. | Leatherdale, S.T. | Meyer, S.B. | Elliott, S.J. | Majowicz, S.E.	2022	International Journal of Social Research Methodology
CO2 uptake decreased and CH4 emissions increased in first two years of peatland seismic line restoration	Schmidt, M. | Davidson, S.J. | Strack, M.	2022	Wetlands Ecology and Management
Structures of distant diphtheria toxin homologs reveal functional determinants of an evolutionarily conserved toxin scaffold	Sugiman-Marangos, S.N. | Gill, S.K. | Mansfield, M.J. | Orrell, K.E. | Doxey, A.C. | Melnyk, R.A.	2022	Communications Biology
Droplet formation of biological non-Newtonian fluid in T-junction generators. II. Model for final droplet volume prediction	Marcali, M. | Chen, X. | Aucoin, M.G. | Ren, C.L.	2022	Physical Review E
Ribosome-binding Sequences (RBS) Engineering of Key Genes in Escherichia coli for High Production of Fatty Alcohols	Chen, R. | Liu, Y. | Zhong, W. | Hao, X. | Mu, T. | Yang, M. | Xing, J.	2022	Biotechnology and Bioprocess Engineering
Laws, Policies, and Collective Agreements Protecting Low-wage and Digital Platform Workers During the COVID-19 Pandemic	MacEachen, E. | de Rijk, A. | Dyreborg, J. | Fassier, J.-B. | Fletcher, M. | Hopwood, P. | Koivusalo, M. | Majowicz, S. | Meyer, S. | Ståhl, C. | Welti, F.	2022	New Solutions

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Practicalities of implementing burden of disease research in Africa: lessons from a population survey component of our multi-partner FOCAL research project	Desta, B.N. | Gobena, T. | Macuamule, C. | Fayemi, O.E. | Ayolabi, C.I. | Mmbaga, B.T. | Thomas, K.M. | Dodd, W. | Pires, S.M. | Majowicz, S.E. | Hald, T.	2022	Emerging Themes in Epidemiology
Calibrating spatiotemporal models of microbial communities to microscopy data: A review	Yip, A. | Smith-Roberge, J. | Khorasani, S.H. | Aucoin, M.G. | Ingalls, B.P.	2022	PLoS Computational Biology
Microbial Community Compositional Stability in Agricultural Soils During Freeze-Thaw and Fertilizer Stress	Jensen, G. | Krogstad, K. | Rezanezhad, F. | Hug, L.A.	2022	Frontiers in Environmental Science
NLoed: A Python Package for Nonlinear Optimal Experimental Design in Systems Biology	Braniff, N. | Pearce, T. | Lu, Z. | Astwood, M. | Forrest, W.S.R. | Receno, C. | Ingalls, B.	2022	ACS Synthetic Biology
Kinetic characterization and modeling of sequentially entrapped enzymes in 3D-printed PMMA microfluidic reactors for the synthesis of amorphadiene via the isopentenol utilization pathway	Kabernick, D.C. | Gostick, J.T. | Ward, V.C.A.	2022	Biotechnology and Bioengineering
Elevated carbon dioxide and temperature effects on soil properties from sole crops and intercrops	Oelbermann, M. | Morgan, S. | Echarte, L.	2022	Soil Use and Management
Identification and characterization of a novel peptide from rainbow trout (Oncorhynchus mykiss) with antimicrobial activity against Streptococcus iniae	Varga, J.F.A. | Brunner, S.R. | Cheng, G. | Min, D. | Aucoin, M.G. | Doxey, A.C. | Dixon, B.	2022	Developmental and Comparative Immunology
Investigating Farmer Perspectives and Compost Application for Soil Management in Urban Agriculture in Mwanza, Tanzania	Esmail, S. | Oelbermann, M.	2022	Frontiers in Soil Science
Large Fractionation in Iron Isotopes Implicates Metabolic Pathways for Iron Cycling in Boreal Shield Lakes	Liu, K. | Schiff, S.L. | Wu, L. | Molot, L.A. | Venkiteswaran, J.J. | Paterson, M.J. | Elgood, R.J. | Tsuji, J.M. | Neufeld, J.D.	2022	Environmental Science and Technology
Optimal design of experiments to improve the characterisation of atrazine degradation pathways in soil	Chavez Rodriguez, L. | González-Nicolás, A. | Ingalls, B. | Streck, T. | Nowak, W. | Xiao, S. | Pagel, H.	2022	European Journal of Soil Science
Systematic literature review of SARS-CoV-2 seroprevalence surveys in Canada through April 2021	Major, M. | Majowicz, S.E. | Oremus, M. | Jimenez, L.J. | Angulo, F.J. | Horton, S.	2022	IJID Regions

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Editorial: Functional Metagenomics for Enzyme Discovery	Varaljay, V.A.| Charles, T.C.| Daniel, R.	2022	Frontiers in Microbiology
Mode of action of nanochitin whisker against Fusarium pseudograminearum	Zhang, X.| Liang, S.| Wu, Q.| Charles, T.C.| He, R.| Wu, J.| Zhao, Y.| Zhao, Z.| Wang, H.	2022	International Journal of Biological Macromolecules
On the design principles of metabolic flux sensing	Euler, C.| Mahadevan, R.	2022	Biophysical Journal
Bioengineering in microbial production of biobutanol from renewable resources	Johnsen, P.| Shao, W.| Ma, K.	2022	Current Developments in Biotechnology and Bioengineering: Designer Microbial Cell Factories: Metabolic Engineering and Applications
Vero cells gain renal tubule markers in low-calcium and magnesium chemically defined media	Logan, M.| Rinas, K.| McConkey, B.| Aucoin, M.G.	2022	Scientific Reports
Restoration of a boreal peatland impacted by an in-situ oil sands well-pad 2: Greenhouse gas exchange dynamics	Engering, A.| Davidson, S.J.| Xu, B.| Bird, M.| Rochefort, L.| Strack, M.	2022	Restoration Ecology
“We need to talk to each other”: Crossing traditional boundaries between public health and occupational health to address COVID-19	Hopwood, P.| MacEachen, E.| Majowicz, S.E.| Meyer, S.B.| Amoako, J.	2022	Frontiers in Public Health
Characterization of Thermotoga neapolitana Alcohol Dehydrogenases in the Ethanol Fermentation Pathway	Sha, C.| Wang, Q.| Wang, H.| Duan, Y.| Xu, C.| Wu, L.| Ma, K.| Shao, W.| Jiang, Y.	2022	Biology
Perceived COVID-19 health and job risks faced by digital platform drivers and measures in place to protect them: A qualitative study	MacEachen, E.| Meyer, S.B.| Majowicz, S.| Hopwood, P.| Crouch, M.| Amoako, J.| Jahangir, Y.T.| Durant, S.| Ilic, A.	2022	American Journal of Industrial Medicine
Nitrogen Leaching From Agricultural Soils Under Imposed Freeze-Thaw Cycles: A Column Study With and Without Fertilizer Amendment	Krogstad, K.| Gharasoo, M.| Jensen, G.| Hug, L.A.| Rudolph, D.| Van Cappellen, P.| Rezanezhad, F.	2022	Frontiers in Environmental Science
Thermostable and O2-Insensitive Pyruvate Decarboxylases from Thermoacidophilic Archaea Catalyzing the Production of Acetaldehyde	Alharbi, F.| Knura, T.| Siebers, B.| Ma, K.	2022	Biology

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Imparting conformational memory for material adhesion	Yang, F.| Cholewinski, A.| Honek, J.F.| Wei, W.| Xu, L.| Zhang, W.| Pope, M.A.| Zhao, B.	2022	Materials Horizons
A genomic catalog of Earth's microbiomes	Nayfach, S.| Roux, S.| Seshadri, R.| Udwary, D.| Hug, L.A.| et al.	2021	Nature Biotechnology
Metabolic flexibility determines human NK cell functional fate in the tumor microenvironment	Poznanski, S.M.| Singh, K.| Ritchie, T.M.| Aguiar, J.A.| Fan, I.Y.| Portillo, A.L.| Rojas, E.A.| Vahedi, F.| El-Sayes, A.| Xing, S.| Butcher, M.| Lu, Y.| Doxey, A.C.| Schertzer, J.D.| Hirte, H.W.| Ashkar, A.A.	2021	Cell Metabolism
Burden of foodborne diseases: think global, act local	Pires, S.M.| Desta, B.N.| Mughini-Gras, L.| Mmbaga, B.T.| Fayemi, O.E.| Salvador, E.M.| Gobena, T.| Majowicz, S.E.| Hald, T.| Hoejskov, P.S.| Minato, Y.| Devleesschauwer, B.	2021	Current Opinion in Food Science
Natural climate solutions for Canada	Drever, C.R.| Cook-Patton, S.C.| Akhter, F.| Badiou, P.H.| Chmura, G.L.| Davidson, S.J.| Desjardins, R.L.| Dyk, A.| Fargione, J.E.| Fellows, M.| Filewod, B.| Hessing-Lewis, M.| Jayasundara, S.| Keeton, W.S.| Kroeger, T.| Lark, T.J.| Le, E.| Leavitt, S.M.| LeClerc, M.-E.| Lemprière, T.C.| Metsaranta, J.| McConkey, B.| Neilson, E.| St-Laurent, G.P.| Puric-Mladenovic, D.| Rodrigue, S.| Soolanayakanahally, R.Y.| Spawn, S.A.| Strack, M.| Smyth, C.| Thevathasan, N.| Voicu, M.| Williams, C.A.| Woodbury, P.B.| Worth, D.E.| Xu, Z.| Yeo, S.| Kurz, W.A.	2021	Science Advances
Enhancing diversity analysis by repeatedly rarefying next generation sequencing data describing microbial communities	Cameron, E.S.| Schmidt, P.J.| Tremblay, B.J.-M.| Emelko, M.B.| Müller, K.M.	2021	Scientific Reports
The boreal-arctic wetland and lake dataset (BAWLD)	Olefeldt, D.| Hovemyr, M.| Kuhn, M.A.| Bastviken, D.| Bohn, T.J.| Connolly, J.| Crill, P.| Euskirchen, E.S.| Finkelstein, S.A.| Genet, H.| Grosse, G.| Harris, L.I.| Heffernan, L.| Helbig, M.| Hugelius, G.| Hutchins, R.| Juutinen, S.| Lara, M.J.| Malhotra, A.| Manies, K.| McGuire, A.D.| Natali, S.M.| O'Donnell,	2021	Earth System Science Data

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	J.A. | Parmentier, F.-J.W. | Räsänen, A. | Schädel, C. | Sonnentag, O. | Strack, M. | Tank, S.E. | Treat, C. | Varner, R.K. | Virtanen, T. | Warren, R.K. | Watts, J.D.		
Recent developments in short- and medium-chain-length Polyhydroxyalkanoates: Production, properties, and applications	Muthuraj, R. | Valerio, O. | Mekkonnen, T.H.	2021	International Journal of Biological Macromolecules
Direct transesterification of wet microalgae to biodiesel using phosphonium carboxylate ionic liquid catalysts	Malekghasemi, S. | Kariminia, H.-R. | Plechkova, N.K. | Ward, V.C.A.	2021	Biomass and Bioenergy
Unraveling the Zoonotic Origin and Transmission of SARS-CoV-2	Banerjee, A. | Doxey, A.C. | Mossman, K. | Irving, A.T.	2021	Trends in Ecology and Evolution
Mineral phosphorus drives glacier algal blooms on the Greenland Ice Sheet	McCutcheon, J. | Lutz, S. | Williamson, C. | Cook, J.M. | Tedstone, A.J. | Vanderstraeten, A. | Wilson, S. | Stockdale, A. | Bonneville, S. | Anesio, A.M. | Yallop, M.L. | McQuaid, J.B. | Tranter, M. | Benning, L.G.	2021	Nature Communications
A rapid scoping review of COVID-19 and vulnerable workers: Intersecting occupational and public health issues	Côté, D. | Durant, S. | MacEachen, E. | Majowicz, S. | Meyer, S. | Huynh, A.-T. | Laberge, M. | Dubé, J.	2021	American Journal of Industrial Medicine
Expansion of Agriculture in Northern Cold-Climate Regions: A Cross-Sectoral Perspective on Opportunities and Challenges	Unc, A. | Altdorff, D. | Abakumov, E. | Adl, S. | Baldursson, S. | Bechtold, M. | Cattani, D.J. | Firbank, L.G. | Grand, S. | Guðjónsdóttir, M. | Kallenbach, C. | Kedir, A.J. | Li, P. | McKenzie, D.B. | Misra, D. | Nagano, H. | Neher, D.A. | Niemi, J. | Oelbermann, M. | Overgård Lehmann, J. | Parsons, D. | Quideau, S. | Sharkhuu, A. | Smreczak, B. | Sorvali, J. | Vallotton, J.D. | Whalen, J.K. | Young, E.H. | Zhang, M. | Borchard, N.	2021	Frontiers in Sustainable Food Systems
Plant protein in material extrusion 3D printing: Formation, plasticization, prospects, and challenges	Rowat, S.J. | Legge, R.L. | Moresoli, C.	2021	Journal of Food Engineering
Removal and formation of perfluoroalkyl substances in Canadian sludge treatment systems – A mass balance approach	Lakshminarasimman, N. | Gewurtz, S.B. | Parker, W.J. | Smyth, S.A.	2021	Science of the Total Environment

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Experimental and natural evidence of SARS-CoV-2-infection-induced activation of type I interferon responses	Banerjee, A. | El-Sayes, N. | Budylowski, P. | Jacob, R.A. | Richard, D. | Maan, H. | Aguiar, J.A. | Demian, W.L. | Baid, K. | D'Agostino, M.R. | Ang, J.C. | Murdza, T. | Tremblay, B.J.-M. | Afkhami, S. | Karimzadeh, M. | Irving, A.T. | Yip, L. | Ostrowski, M. | Hirota, J.A. | Kozak, R. | Capellini, T.D. | Miller, M.S. | Wang, B. | Mubareka, S. | McGeer, A.J. | McArthur, A.G. | Doxey, A.C. | Mossman, K.	2021	iScience
New approaches for the characterization of plastic-associated microbial communities and the discovery of plastic-degrading microorganisms and enzymes	Viljakainen, V.R. | Hug, L.A.	2021	Computational and Structural Biotechnology Journal
Development of Microbiome Biobanks – Challenges and Opportunities	Ryan, M.J. | Schloter, M. | Berg, G. | Kostic, T. | Kinkel, L.L. | Eversole, K. | Macklin, J.A. | Schelkle, B. | Kazou, M. | Sarand, I. | Singh, B.K. | Fischer, D. | Maguin, E. | Ferrocino, I. | Lima, N. | McClure, R.S. | Charles, T.C. | de Souza, R.S.C. | Kiran, G.S. | Krug, H.L. | Taffner, J. | Roume, H. | Selvin, J. | Smith, D. | Rybakova, D. | Sessitsch, A.	2021	Trends in Microbiology
Biological albedo reduction on ice sheets, glaciers, and snowfields	Hotaling, S. | Lutz, S. | Dial, R.J. | Anesio, A.M. | Benning, L.G. | Fountain, A.G. | Kelley, J.L. | McCutcheon, J. | Skiles, S.M. | Takeuchi, N. | Hamilton, T.L.	2021	Earth-Science Reviews
Pseudomonas Exotoxin-Based Immunotoxins: Over Three Decades of Efforts on Targeting Cancer Cells With the Toxin	Havaei, S.M. | Aucoin, M.G. | Jahanian-Najafabadi, A.	2021	Frontiers in Oncology
AMR-Intervene: A social-ecological framework to capture the diversity of actions to tackle antimicrobial resistance from a One Health perspective	Léger, A. | Lambraki, I. | Graells, T. | Cousins, M. | Henriksson, P.J.G. | Harbarth, S. | Carson, C. | Majowicz, S. | Troell, M. | Parmley, E.J. | Jørgensen, P.S. | Wernli, D.	2021	Journal of Antimicrobial Chemotherapy
High Throughput Sequencing of MicroRNA in Rainbow Trout Plasma, Mucus, and Surrounding Water Following Acute Stress	Ikert, H. | Lynch, M.D.J. | Doxey, A.C. | Giesy, J.P. | Servos, M.R. | Katzenback, B.A. | Craig, P.M.	2021	Frontiers in Physiology

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Banning colistin in feed additives: a small step in the right direction	Olaitan, A.O. | Dandachi, I. | Baron, S.A. | Daoud, Z. | Morand, S. | Rolain, J.-M.	2021	The Lancet Infectious Diseases
The phylogenetic and global distribution of bacterial polyhydroxyalkanoate bioplastic-degrading genes	Viljakainen, V.R. | Hug, L.A.	2021	Environmental Microbiology
Climate change mitigation and adaptation in agriculture: Why agroforestry should be part of the solution	Cardinael, R. | Cadisch, G. | Gosme, M. | Oelbermann, M. | van Noordwijk, M.	2021	Agriculture, Ecosystems and Environment
Composition of the North American Wood Frog (Rana sylvatica) Bacterial Skin Microbiome and Seasonal Variation in Community Structure	Douglas, A.J. | Hug, L.A. | Katzenback, B.A.	2021	Microbial Ecology
Low sediment redox promotes cyanobacteria blooms across a trophic range: implications for management	Molot, L.A. | Schiff, S.L. | Venkiteswaran, J.J. | Baulch, H.M. | Higgins, S.N. | Zastepa, A. | Verschoor, M.J. | Walters, D.	2021	Lake and Reservoir Management
Robust evaluation of ultraviolet-c sensitivity for sars-cov-2 and surrogate coronaviruses	Boegel, S.J. | Gabriel, M. | Sasges, M. | Petri, B. | D'Agostino, M.R. | Zhang, A. | Ang, J.C. | Miller, M.S. | Meunier, S.M. | Aucoin, M.G.	2021	Microbiology Spectrum
Biobehavioral Aspects of the COVID-19 Pandemic: A Review	Hall, P.A. | Sheeran, P. | Fong, G.T. | Cheah, C.S.L. | Oremus, M. | Liu-Ambrose, T. | Sakib, M.N. | Butt, Z.A. | Ayaz, H. | Jandu, N. | Morita, P.P.	2021	Psychosomatic Medicine
Characterization and modelling of soluble microbial products in activated sludge systems treating municipal wastewater with special emphasis on temperature effect	Tao, C. | Parker, W. | Bérubé, P.	2021	Science of the Total Environment
Effectiveness of antiviral metal and metal oxide thin-film coatings against human coronavirus 229E	Delumeau, L.-V. | Asgarimoghaddam, H. | Alkie, T. | Jones, A.J.B. | Lum, S. | Mistry, K. | Aucoin, M.G. | Dewitte-Orr, S. | Musselman, K.P.	2021	APL Materials
Reduced Susceptibility to Metronidazole Is Associated with Initial Clinical Failure in Clostridioides difficile Infection	Gonzales-Luna, A.J. | Olaitan, A.O. | Shen, W.-J. | Deshpande, A. | Carlson, T.J. | Dotson, K.M. | Lancaster, C. | Begum, K. | Alam, M.J. | Hurdle, J.G. | Garey, K.W.	2021	Open Forum Infectious Diseases
Phosphorus-only fertilization rapidly initiates large nitrogen-fixing cyanobacteria blooms in two oligotrophic lakes	Molot, L.A. | Higgins, S.N. | Schiff, S.L. | Venkiteswaran, J.J. | Paterson, M.J. | Baulch, H.M.	2021	Environmental Research Letters

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The Integrity of Heme Is Essential for Reproducible Detection of Metronidazole-Resistant Clostridioides difficile by Agar Dilution Susceptibility Tests	Wu, X.| Shen, W.-J.| Deshpande, A.| Olaitan, A.O.| Palmer, K.L.| Garey, K.W.| Hurdle, J.G.	2021	Journal of Clinical Microbiology
Human biomonitoring results of contaminant and nutrient biomarkers in Old Crow, Yukon, Canada	Drysdale, M.| Ratelle, M.| Skinner, K.| Garcia-Barrios, J.| Gamberg, M.| Williams, M.| Majowicz, S.| Bouchard, M.| Stark, K.| Chalil, D.| Laird, B.D.	2021	Science of the Total Environment
NextGen Public Health Surveillance and the Internet of Things (IoT)	Sahu, K.S.| Majowicz, S.E.| Dubin, J.A.| Morita, P.P.	2021	Frontiers in Public Health
Macrophage Immunomodulation Through New Polymers that Recapitulate Functional Effects of Itaconate as a Power House of Innate Immunity	Davenport Huyer, L.| Mandla, S.| Wang, Y.| Campbell, S.B.| Yee, B.| Euler, C.| Lai, B.F.| Bannerman, A.D.| Lin, D.S.Y.| Montgomery, M.| Nemr, K.| Bender, T.| Epelman, S.| Mahadevan, R.| Radisic, M.	2021	Advanced Functional Materials
Genomic analysis of a newly isolated acidithiobacillus ferridurans jags strain reveals its adaptation to acid mine drainage	Chen, J.| Liu, Y.| Diep, P.| Mahadevan, R.	2021	Minerals
Characterizing social-ecological context and success factors of antimicrobial resistance interventions across the One Health spectrum: analysis of 42 interventions targeting E. coli	Léger, A.| Lambraki, I.| Graells, T.| Cousins, M.| Henriksson, P.J.G.| Harbarth, S.| Carson, C.A.| Majowicz, S.E.| Troell, M.| Parmley, E.J.| Jørgensen, P.S.| Wernli, D.	2021	BMC Infectious Diseases
A novel bifunctional aldehyde/alcohol dehydrogenase catalyzing reduction of acetyl-CoA to ethanol at temperatures up to 95 °C	Wang, Q.| Sha, C.| Wang, H.| Ma, K.| Wiegle, J.| Abomohra, A.E.-F.| Shao, W.	2021	Scientific Reports
Driving factors influencing the rhizobacteriome community structure of plants adapted to multiple climatic stressors in edaphic savannas	Thomas-Barry, G.| St. Martin, C.C.G.| Lynch, M.D.J.| Ramsubhag, A.| Rouse-Miller, J.| Charles, T.C.	2021	Science of the Total Environment
Enzymatic polymerization designed alpha-1,3 glucan particle morphology as reinforcing fillers of dipped and casted rubber films	Adibi, A.| Kim, J.| Mok, J.| Lenges, C.| Simon, L.| Mekkonnen, T.H.	2021	Carbohydrate Polymers
Linear Disturbances Shift Boreal Peatland Plant Communities Toward Earlier Peak Greenness	Davidson, S.J.| Goud, E.M.| Malhotra, A.| Estey, C.O.| Korsah, P.| Strack, M.	2021	Journal of Geophysical Research: Biogeosciences

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Predicting the recombination potential of severe acute respiratory syndrome coronavirus 2 and Middle East respiratory syndrome coronavirus	Banerjee, A. | Doxey, A.C. | Benjamin J.-M. Tremblay | Mansfield, M.J. | Subudhi, S. | Hirota, J.A. | Miller, M.S. | Andrew G. McArthur | Mubareka, S. | Mossman, K.	2021	Journal of General Virology
Building social-ecological system resilience to tackle antimicrobial resistance across the one health spectrum: Protocol for a mixed methods study	Lambraki, I.A. | Majowicz, S.E. | Parmley, E.J. | Wernli, D. | Léger, A. | Graells, T. | Cousins, M. | Harbarth, S. | Carson, C. | Henriksson, P. | Troell, M. | Jørgensen, P.S.	2021	JMIR Research Protocols
PhyloCorrelate: inferring bacterial gene-gene functional associations through large-scale phylogenetic profiling	Tremblay, B.J.-M. | Lobb, B. | Doxey, A.C.	2021	Bioinformatics
AXIOME3: Automation, eXtension, and Integration of Microbial Ecology	Min, D. | Doxey, A.C. | Neufeld, J.D.	2021	GigaScience
The Charge-State and Structural Stability of Peptides Conferred by Microsolvating Environments in Differential Mobility Spectrometry	Ieritano, C. | Rickert, D. | Featherstone, J. | Honek, J.F. | Campbell, J.L. | Blanc, J.C.Y.L. | Schneider, B.B. | Hopkins, W.S.	2021	Journal of the American Society for Mass Spectrometry
Genome sequence of brevundimonas sp., an arsenic resistant soil bacterium	Soto, J. | Charles, T.C. | Lynch, M.D.J. | Larama, G. | Herrera, H. | Arriagada, C.	2021	Diversity
Isotopic Characterization of Sulfate in a Shallow Aquifer Impacted by Agricultural Fertilizer	Spoelstra, J. | Leal, K.A. | Senger, N.D. | Schiff, S.L. | Post, R.	2021	Groundwater
Nitrogen Attenuation in Septic System Plumes	Robertson, W.D. | Van Stempvoort, D.R. | Schiff, S.L.	2021	Groundwater
Impact of AnMBR operating conditions on anaerobic digestion of waste activated sludge	Dagnew, M. | Parker, W.	2021	Water Environment Research
Advancing undergraduate synthetic biology education: Insights from a canadian igem student perspective	Diep, P. | Boucinha, A. | Kell, B. | Yeung, B.A. | Chen, X. | Tsyplenkov, D. | Serra, D. | Escobar, A. | Gnanapragasam, A. | Emond, C.A. | Sajtovich, V.A. | Mahadevan, R. | Kilkenny, D.M. | Gini-Newman, G. | Kaern, M. | Ingalls, B.	2021	Canadian Journal of Microbiology
Archaea are rare and uncommon members of the mammalian skin microbiome	Umbach, A.K. | Stegelmeier, A.A. | Neufeld, J.D.	2021	mSystems
Virus matrix interference on assessment of virucidal activity of high-touch surfaces designed to prevent hospital-acquired infections	Walji, S.-D. | Bruder, M.R. | Aucoin, M.G.	2021	Antimicrobial Resistance and Infection Control

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Ebselen not only inhibits clostridioides difficile toxins but displays redox-associated cellular killing	Marreddy, R.K.R. | Olaitan, A.O. | May, J.N. | Dong, M. | Hurdle, J.G.	2021	Microbiology Spectrum
Greenhouse gas emissions from riparian zones are related to vegetation type and environmental factors	Baskerville, M. | Bazrgar, A. | Reddy, N. | Ofosu, E. | Thevathasan, N. | Gordon, A.M. | Oelbermann, M.	2021	Journal of Environmental Quality
Vegetation Type Does not Affect Nitrous Oxide Emissions from Riparian Zones in Agricultural Landscapes	Baskerville, M. | Reddy, N. | Ofosu, E. | Thevathasan, N.V. | Oelbermann, M.	2021	Environmental Management
In-line coagulation assessment for ultrafiltration fouling reduction to treat secondary effluent for water reuse	Aly, S.A. | Anderson, W.B. | Huck, P.M.	2021	Water Science and Technology
Carbon accounting of mined landscapes, and deployment of a geochemical treatment system for enhanced weathering at Woodsreef Chrysotile Mine, NSW, Australia	Hamilton, J.L. | Wilson, S. | Turvey, C.C. | Morgan, B. | Tait, A.W. | McCutcheon, J. | Fallon, S.J. | Southam, G.	2021	Journal of Geochemical Exploration
Previously unrecognized potential threat to children from manganese in groundwater in rohingya refugee camps in Cox's Bazar, Bangladesh	Rahman, M.F. | Mahmud, M.J. | Sadmani, A.H.M.A. | Chowdhury, A.I. | Anderson, W.B. | Bodruzzaman, A.B.M. | Huq, S.	2021	Chemosphere
Size-based characterization of freshwater dissolved organic matter finds similarities within a waterbody type across different Canadian ecozones	Aukes, P.J.K. | Schiff, S.L. | Venkiteswaran, J.J. | Elgood, R.J. | Spoelstra, J.	2021	Limnology And Oceanography Letters
Opportunities and Challenges for Microbial Synthesis of Fatty Acid-Derived Chemicals (FACs)	Liu, Y. | Benitez, M.G. | Chen, J. | Harrison, E. | Khusnutdinova, A.N. | Mahadevan, R.	2021	Frontiers in Bioengineering and Biotechnology
High sulfate concentrations maintain low methane emissions at a constructed fen over the first seven years of ecosystem development	Davidson, S.J. | Smith, M. | Prystupa, E. | Murray, K. | Nwaishi, F.C. | Petrone, R.M. | Strack, M.	2021	Science of the Total Environment
Comparison of crispr–cas9 tools for transcriptional repression and gene disruption in the bevs	Bruder, M.R. | Walji, S.-D. | Aucoin, M.G.	2021	Viruses
Developing understanding of the fate and behaviour of silver in fresh waters and waste waters	Smith, D.S. | Nasir, R. | Parker, W. | Peters, A. | Merrington, G. | van Egmond, R. | Lofts, S.	2021	Science of the Total Environment
Area-Level Clustering of Shiga Toxin-Producing Escherichia coli Infections and Their Socioeconomic	Varga, C. | John, P. | Cooke, M. | Majowicz, S.E.	2021	Foodborne Pathogens and Disease

Title	Authors	Year	Journal or Conference
and Demographic Factors in Ontario, Canada: An Ecological Study			
Steady and ebullitive methane fluxes from active, restored and unrestored horticultural peatlands	Bieniada, A.| Strack, M.	2021	Ecological Engineering
Cutover Peat Limits Methane Production Causing Low Emission at a Restored Peatland	Nugent, K.A.| Strachan, I.B.| Strack, M.| Roulet, N.T.| Ström, L.| Chanton, J.P.	2021	Journal of Geophysical Research: Biogeosciences
Treatment of municipal wastewater in AnMBRs with powdered activated carbon addition under psychrophilic temperatures	Li, L.| Parker, W.	2021	Water Environment Research
Monitoring Microbial Populations and Antibiotic Resistance Gene Enrichment Associated with Arctic Waste Stabilization Ponds	Gromala, M.| Neufeld, J.D.| McConkey, B.J.	2021	Applied and Environmental Microbiology
PathFams: statistical detection of pathogen-associated protein domains	Lobb, B.| Tremblay, B.J.-M.| Moreno-Hagelsieb, G.| Doxey, A.C.	2021	BMC Genomics
Modeling Bioavailability Limitations of Atrazine Degradation in Soils	Chavez Rodriguez, L.| Ingalls, B.| Meierdierks, J.| Kundu, K.| Streck, T.| Pagel, H.	2021	Frontiers in Environmental Science
Prediction, enrichment and isolation identify a responsive, competitive community of cellulolytic microorganisms from a municipal landfill	Co, R.| Hug, L.A.	2021	FEMS Microbiology Ecology
Organic matter decomposition at a constructed fen in the Athabasca Oil Sands region: Effect of substrate type and environmental conditions	Coulas, M.| Parsons, C.| Saraswati, S.| Strack, M.	2021	Science of the Total Environment
Restoration approach influences carbon exchange at in-situ oil sands exploration sites in east-central Alberta	Murray, K.R.| Bird, M.| Strack, M.| Cody, M.| Xu, B.	2021	Wetlands Ecology and Management
Potentiation of long-acting β2-agonist and glucocorticoid responses in human airway epithelial cells by modulation of intracellular cAMP	Kim, Y.| Hou, V.| Huff, R.D.| Aguiar, J.A.| Revill, S.| Tiessen, N.| Cao, Q.| Miller, M.S.| Inman, M.D.| Ask, K.| Doxey, A.C.| Hirota, J.A.	2021	Respiratory Research
Publisher Correction: A genomic catalog of Earth's microbiomes	Nayfach, S.| Roux, S.| Seshadri, R.| Udwary, D.| Varghese, N.| Hug, L.A.| et al.	2021	Nature Biotechnology
Composition Wheels: Visualizing dissolved organic matter using common composition metrics across a variety of Canadian ecozones	Aukes, P.J.K.| Schiff, S.L.	2021	PLoS ONE

Title	Authors	Year	Journal or Conference
Thermal behavior and kinetic study of plasticized cellulose acetate magnesium hydroxide Polypropylene materials	Al-Kubaisi, O.| Nasseri, R.| Moresoli, C.| Yu, A.	2021	Materials Today: Proceedings
Author Correction: Roadmap for naming uncultivated Archaea and Bacteria	Murray, A.E.| Freudenstein, J.| Gribaldo, S.| Hatzenpichler, R.| Hugenholtz, P.| Kämpfer, P.| Konstantinidis, K.T.| Hug, L.A. et al.	2021	Nature Microbiology
Strain engineering and bioprocessing strategies for biobased production of porphobilinogen in Escherichia coli	Lall, D.| Miscevic, D.| Bruder, M.| Westbrook, A.| Aucoin, M.| Moo-Young, M.| Perry Chou, C.	2021	Bioresources and Bioprocessing
Adapting Macroecology to Microbiology: Using Occupancy Modeling To Assess Functional Profiles across Metagenomes	Hilts, A.S.| Hunjan, M.S.| Hug, L.A.	2021	mSystems
Batch test to evaluate microbial disinfectant decay and the onset of nitrification	Scott, D.B.| Van Dyke, M.I.| Anderson, W.B.| King, P.W.| Huck, P.M.	2021	Aqua Water Infrastructure, Ecosystems and Society
Enhanced characterization of yeast hydrolysate combining acid digestion and 1D-1H NMR targeted profiling	Quattrociocchi, M.| Boegel, S.J.| Aucoin, M.G.	2021	Canadian Journal of Chemical Engineering
Sequence polarity between the promoter and the adjacent gene modulates promoter activity	Tran, T.T.| Charles, T.C.	2021	Plasmid
Bioconjugation of bacteriophage Pf1 and extension to Pf1-based bionanomaterials	Urquhart, T.| Howie, B.| Zhang, L.| Leung, K.T.| Honek, J.F.	2021	Current Nanoscience
Intra- and Inter-Annual Variability in the Dissolved Inorganic Nitrogen in an Urbanized River before and after Wastewater Treatment Plant Upgrades: Case Study in the Grand River (Southwestern Ontario)	Cejudo, E.| Rosamond, M.S.| Elgood, R.J.| Schiff, S.L.	2021	Nitrogen (Switzerland)
Dissolved organic carbon production and transport within a constructed fen watershed in the Athabasca Oil Sands Region, Alberta, Canada	Irvine, S.| Davidson, S.J.| Price, J.S.| Strack, M.	2021	Journal of Hydrology
Metabolic models predict evolutionary dynamics	Scott, M.	2021	Nature Ecology and Evolution
Impacts on International Research Collaborations from DSI/ABS Uncertainty	Smyth, S.J.| Charles, T.C.	2021	Trends in Biotechnology

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A Keller-Segel model for C elegans L1 aggregation	Avery, L.| Ingalls, B.| Dumur, C.| Artyukhin, A.	2021	PLoS Computational Biology
Erratum: Gene-centric model approaches for accurate prediction of pesticide biodegradation in soils (Environmental Science and Technology (2020) 54:21 (13638-13650) DOI: 10.1021/acs.est.0c03315)	Chavez Rodriguez, L.| Ingalls, B.| Schwarz, E.| Streck, T.| Uksa, M.| Pagel, H.	2021	Environmental Science and Technology
Developing engineering leadership skills through student-led workshops in the context of engineering grand challenges	Ibrahim, N.| Donald, J.| Moresoli, C.	2021	9th Research in Engineering Education Symposium and 32nd Australasian Association for Engineering Education Conference
Hemagglutination Assay to Quantify Influenza A Virus Like Particles in Droplets	Marcali, M.| Aucoin, M.G.| Ren, C.	2021	MicroTAS 2021 - 25th International Conference on Miniaturized Systems for Chemistry and Life Sciences
Microbiome definition re-visited: old concepts and new challenges	Berg, G.| Rybakova, D.| Fischer, D.| Cernava, T.| Vergès, M.-C.C.| Charles, T.| Chen, X.| Cocolin, L.| Eversole, K.| Corral, G.H.| Kazou, M.| Kinkel, L.| Lange, L.| Lima, N.| Loy, A.| Macklin, J.A.| Maguin, E.| Mauchline, T.| McClure, R.| Mitter, B.| Ryan, M.| Sarand, I.| Smidt, H.| Schelkle, B.| Roume, H.| Kiran, G.S.| Selvin, J.| Souza, R.S.C.D.| Van Overbeek, L.| Singh, B.K.| Wagner, M.| Walsh, A.| Sessitsch, A.| Schloter, M.	2020	Microbiome
Engineered nanomaterials for antimicrobial applications: A review	Ogunsona, E.O.| Muthuraj, R.| Ojogbo, E.| Valerio, O.| Mekkonnen, T.H.	2020	Applied Materials Today
Gene expression and in situ protein profiling of candidate SARS-CoV-2 receptors in human airway epithelial cells and lung tissue	Aguiar, J.A.| Tremblay, B.J.-M.| Mansfield, M.J.| Woody, O.| Lobb, B.| Banerjee, A.| Chandiramohan, A.| Tiessen, N.| Cao, Q.| Dvorkin-Gheva, A.| Revill, S.| Miller, M.S.| Carlsten, C.| Organ, L.| Joseph, C.|	2020	European Respiratory Journal

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	John, A. | Hanson, P. | Austin, R.C. | McManus, B.M. | Jenkins, G. | Mossman, K. | Ask, K. | Doxey, A.C. | Hirota, J.A.		
Roadmap for naming uncultivated Archaea and Bacteria	Murray, A.E. | Freudenstein, J. | Gribaldo, S. | Hatzenpichler, R. | Hugenholtz, P. | Kämpfer, P. | Konstantinidis, K.T. | Lane, C.E. | Papke, R.T. | Parks, D.H. | Rossello-Mora, R. | Stott, M.B. | Sutcliffe, I.C. | Thrash, J.C. | Venter, S.N. | Whitman, W.B. | Acinas, S.G. | Amann, R.I. | Anantharaman, K. | Armengaud, J. | Baker, B.J. | Barco, R.A. | Bode, H.B. | Boyd, E.S. | Brady, C.L. | Carini, P. | Chain, P.S.G. | Colman, D.R. | DeAngelis, K.M. | de los Rios, M.A. | Estrada-de los Santos, P. | Dunlap, C.A. | Eisen, J.A. | Emerson, D. | Ettema, T.J.G. | Eveillard, D. | Girguis, P.R. | Hentschel, U. | Hollibaugh, J.T. | Hug, L.A. | Inskeep, W.P. | Ivanova, E.P. | Klenk, H.-P. | Li, W.-J. | Lloyd, K.G. | Löffler, F.E. | Makhalanyane, T.P. | Moser, D.P. | Nunoura, T. | Palmer, M. | Parro, V. | Pedrós-Alió, C. | Probst, A.J. | Smits, T.H.M. | Steen, A.D. | Steenkamp, E.T. | Spang, A. | Stewart, F.J. | Tiedje, J.M. | Vandamme, P. | Wagner, M. | Wang, F.-P. | Hedlund, B.P. | Reysenbach, A.-L.	2020	Nature Microbiology
High functional diversity among Nitrospira populations that dominate rotating biological contactor microbial communities in a municipal wastewater treatment plant	Spasov, E. | Tsuji, J.M. | Hug, L.A. | Doxey, A.C. | Sauder, L.A. | Parker, W.J. | Neufeld, J.D.	2020	ISME Journal
Enhancing isoprenoid synthesis in Yarrowia lipolytica by expressing the isopentenol utilization pathway and modulating intracellular hydrophobicity	Luo, Z. | Liu, N. | Lazar, Z. | Chatzivasileiou, A. | Ward, V. | Chen, J. | Zhou, J. | Stephanopoulos, G.	2020	Metabolic Engineering
Glacier algae accelerate melt rates on the south-western Greenland Ice Sheet	Cook, J.M. | Tedstone, A.J. | Williamson, C. | McCutcheon, J. | Hodson, A.J. | Dayal, A. | Skiles, M. | Hofer, S. | Bryant, R. | McAree, O. | McGonigle, A. | Ryan, J. | Anesio, A.M. | Irvine-Fynn, T.D.L. | Hubbard,	2020	Cryosphere

Title	Authors	Year	Journal or Conference
	A. | Hanna, E. | Flanner, M. | Mayanna, S. | Benning, L.G. | Van As, D. | Yallop, M. | McQuaid, J.B. | Gribbin, T. | Tranter, M.		
Algal photophysiology drives darkening and melt of the Greenland Ice Sheet	Williamson, C.J. | Cook, J. | Tedstone, A. | Yallop, M. | McCutcheon, J. | Poniecka, E. | Campbell, D. | Irvine-Fynn, T. | McQuaid, J. | Tranter, M. | Perkins, R. | Anesio, A.	2020	Proceedings of the National Academy of Sciences of the United States of America
Groundwater Elusimicrobia are metabolically diverse compared to gut microbiome Elusimicrobia and some have a novel nitrogenase paralog	Méheust, R. | Castelle, C.J. | Matheus Carnevali, P.B. | Farag, I.F. | He, C. | Chen, L.-X. | Amano, Y. | Hug, L.A. | Banfield, J.F.	2020	ISME Journal
Applications of Microbial β-Mannanases	Dawood, A. | Ma, K.	2020	Frontiers in Bioengineering and Biotechnology
Deep reinforcement learning for the control of microbial co-cultures in bioreactors	Treloar, N.J. | Fedorec, A.J.H. | Ingalls, B. | Barnes, C.P.	2020	PLoS Computational Biology
Archaeal nitrification is constrained by copper complexation with organic matter in municipal wastewater treatment plants	Gwak, J.-H. | Jung, M.-Y. | Hong, H. | Kim, J.-G. | Quan, Z.-X. | Reinfelder, J.R. | Spasov, E. | Neufeld, J.D. | Wagner, M. | Rhee, S.-K.	2020	ISME Journal
An assessment of genome annotation coverage across the bacterial tree of life	Lobb, B. | Tremblay, B.J.-M. | Moreno-Hagelsieb, G. | Doxey, A.C.	2020	Microbial Genomics
Metagenomic and chemical characterization of soil cobalamin production	Lu, X. | Heal, K.R. | Ingalls, A.E. | Doxey, A.C. | Neufeld, J.D.	2020	ISME Journal
Organic phosphorus removal using an integrated advanced oxidation-ultrafiltration process	Gray, H.E. | Powell, T. | Choi, S. | Smith, D.S. | Parker, W.J.	2020	Water Research
Poly(lactic acid)/acetylated starch blends: Effect of starch acetylation on the material properties	Nasseri, R. | Ngunjiri, R. | Moresoli, C. | Yu, A. | Yuan, Z. | Xu, C.C.	2020	Carbohydrate Polymers
Fungal and bacterial microbiome associated with the rhizosphere of native plants from the atacama desert	Fuentes, A. | Herrera, H. | Charles, T.C. | Arriagada, C.	2020	Microorganisms
Algal growth and weathering crust state drive variability in western Greenland Ice Sheet ice albedo	Tedstone, A.J. | Cook, J.M. | Williamson, C.J. | Hofer, S. | McCutcheon, J. | Irvine-Fynn, T. | Gribbin, T. | Tranter, M.	2020	Cryosphere

Title	Authors	Year	Journal or Conference
Phylogenomics of 8,839 Clostridioides difficile genomes reveals recombination-driven evolution and diversification of toxin A and B	Mansfield, M.J. | Tremblay, B.J.-M. | Zeng, J. | Wei, X. | Hodgins, H. | Worley, J. | Bry, L. | Dong, M. | Doxey, A.C.	2020	PLoS Pathogens
Functionalized starch microparticles for contact-active antimicrobial polymer surfaces	Ojogbo, E. | Ward, V. | Mekkonnen, T.H.	2020	Carbohydrate Polymers
Expanding perspectives of soil nitrification to include ammonia-oxidizing archaea and comammox bacteria	Lu, X. | Taylor, A.E. | Myrold, D.D. | Neufeld, J.D.	2020	Soil Science Society of America Journal
Seismic Line Disturbance Alters Soil Physical and Chemical Properties Across Boreal Forest and Peatland Soils	Davidson, S.J. | Goud, E.M. | Franklin, C. | Nielsen, S.E. | Strack, M.	2020	Frontiers in Earth Science
Evidence for action: a One Health learning platform on interventions to tackle antimicrobial resistance	Wernli, D. | Jørgensen, P.S. | Parmley, E.J. | Troell, M. | Majowicz, S. | Harbarth, S. | Léger, A. | Lambraki, I. | Graells, T. | Henriksson, P.J.G. | Carson, C. | Cousins, M. | Skoog Ståhlgren, G. | Mohan, C.V. | Simpson, A.J.H. | Wieland, B. | Pedersen, K. | Schneider, A. | Chandy, S.J. | Wijayathilaka, T.P. | Delamare-Deboutteville, J. | Vila, J. | Stålsby Lundborg, C. | Pittet, D.	2020	The Lancet Infectious Diseases
Temperate infection in a virus–host system previously known for virulent dynamics	Knowles, B. | Bonachela, J.A. | Behrenfeld, M.J. | Bondoc, K.G. | Cael, B.B. | Carlson, C.A. | Cieslik, N. | Diaz, B. | Fuchs, H.L. | Graff, J.R. | Grasis, J.A. | Halsey, K.H. | Haramaty, L. | Johns, C.T. | Natale, F. | Nissimov, J.I. | Schieler, B. | Thamatrakoln, K. | Frede Thingstad, T. | Våge, S. | Watkins, C. | Westberry, T.K. | Bidle, K.D.	2020	Nature Communications
Isolation and identification of endophytic bacteria from mycorrhizal tissues of terrestrial orchids from Southern Chile	Herrera, H. | Sanhueza, T. | Novotná, A. | Charles, T.C. | Arriagada, C.	2020	Diversity
Riparian land-use systems impact soil microbial communities and nitrous oxide emissions in an agro-ecosystem	Mafa-Attoye, T.G. | Baskerville, M.A. | Ofosu, E. | Oelbermann, M. | Thevathasan, N.V. | Dunfield, K.E.	2020	Science of the Total Environment

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Septic systems contribute artificial sweeteners to streams through groundwater	Spoelstra, J.| Schiff, S.L.| Brown, S.J.	2020	Journal of Hydrology X
Improved groundwater table and L-band brightness temperature estimates for Northern Hemisphere peatlands using new model physics and SMOS observations in a global data assimilation framework	Bechtold, M.| De Lannoy, G.J.M.| Reichle, R.H.| Roose, D.| Balliston, N.| Burdun, I.| Devito, K.| Kurbatova, J.| Strack, M.| Zarov, E.A.	2020	Remote Sensing of Environment
Biochar in temperate soils: opportunities and challenges	Lévesque, V.| Oelbermann, M.| Ziadi, N.	2020	Canadian Journal of Soil Science
Dynamics of microbial populations and diversity in NAPL contaminated peat soil under varying water table conditions	Gupta, P.K.| Gharedaghloo, B.| Lynch, M.| Cheng, J.| Strack, M.| Charles, T.C.| Price, J.S.	2020	Environmental Research
Anoxygenic photosynthesis and iron–sulfur metabolic potential of Chlorobia populations from seasonally anoxic Boreal Shield lakes	Tsuji, J.M.| Tran, N.| Schiff, S.L.| Venkiteswaran, J.J.| Molot, L.A.| Tank, M.| Hanada, S.| Neufeld, J.D.	2020	ISME Journal
Describing water treatment process performance: Why average log-reduction can be a misleading statistic	Schmidt, P.J.| Anderson, W.B.| Emelko, M.B.	2020	Water Research
Enzymatic polymerization derived engineered polysaccharides as reinforcing fillers of ethylene vinyl acetate composites	Mekkonnen, T.H.| Behabtu, N.| Lenges, C.	2020	Carbohydrate Polymers
Seasonal habitat drives intestinal microbiome composition in anadromous Arctic char (Salvelinus alpinus)	Element, G.| Engel, K.| Neufeld, J.D.| Casselman, J.M.| van Coeverden de Groot, P.| Greer, C.W.| Walker, V.K.	2020	Environmental Microbiology
Plant diversity and agroecosystem function in riparian agroforests: Providing ecosystem services and land-use transition	Buchanan, S.W.| Baskerville, M.| Oelbermann, M.| Gordon, A.M.| Thevathasan, N.V.| Isaac, M.E.	2020	Sustainability (Switzerland)
Hydrological effects of resource-access road crossings on boreal forested peatlands	Saraswati, S.| Petrone, R.M.| Rahman, M.M.| McDermid, G.J.| Xu, B.| Strack, M.	2020	Journal of Hydrology
Extreme rainfall drives early onset cyanobacterial bloom	Larsen, M.L.| Baulch, H.M.| Schiff, S.L.| Simon, D.F.| Sauvé, S.| Venkiteswaran, J.J.	2020	Facets
The C. difficile toxin B membrane translocation machinery is an evolutionarily conserved protein delivery apparatus	Orrell, K.E.| Mansfield, M.J.| Doxey, A.C.| Melnyk, R.A.	2020	Nature Communications

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Lactic acid containing polymers produced in engineered Sinorhizobium meliloti and Pseudomonas putida	Tran, T.T.| Charles, T.C.	2020	PLoS ONE
Dynamic Cell Programming with Quorum Sensing-Controlled CRISPRi Circuit	Liu, Y.| Chen, J.| Crisante, D.| Jaramillo Lopez, J.M.| Mahadevan, R.	2020	ACS Synthetic Biology
Spatial and space-time clustering and demographic characteristics of human nontyphoidal Salmonella infections with major serotypes in Toronto, Canada	Varga, C.| John, P.| Cooke, M.| Majowicz, S.E.	2020	PLoS ONE
Expression of endocannabinoid system components in human airway epithelial cells: Impact of sex and chronic respiratory disease status	Fantauzzi, M.F.| Aguiar, J.A.| Tremblay, B.J.-M.| Mansfield, M.J.| Yanagihara, T.| Chandiramohan, A.| Revill, S.| Ryu, M.H.| Carlsten, C.| Ask, K.| Stämpfli, M.| Doxey, A.C.| Hirota, J.A.	2020	ERJ Open Research
Carbon turnover and microbial activity in an artificial soil under imposed cyclic drainage and imbibition	Pronk, G.J.| Mellage, A.| Milojevic, T.| Smeaton, C.M.| Engel, K.| Neufeld, J.D.| Rezanezhad, F.| Van Cappellen, P.	2020	Vadose Zone Journal
Gene-Centric Model Approaches for Accurate Prediction of Pesticide Biodegradation in Soils	Chavez Rodriguez, L.| Ingalls, B.| Schwarz, E.| Streck, T.| Uksa, M.| Pagel, H.	2020	Environmental Science and Technology
A critical evaluation of current protocols for self-sterilizing surfaces designed to reduce viral nosocomial infections	Walji, S.-D.| Aucoin, M.G.	2020	American Journal of Infection Control
Time series resolution of the fish necrobiome reveals a decomposer succession involving toxigenic bacterial pathogens	Lobb, B.| Hodgson, R.| Lynch, M.D.J.| Mansfield, M.J.| Cheng, J.| Charles, T.C.| Neufeld, J.D.| Craig, P.M.| Doxey, A.C.	2020	mSystems
Heterogeneous method of chitosan film preparation: Effect of multifunctional acid on film properties	Khouri, J.| Penlidis, A.| Moresoli, C.	2020	Journal of Applied Polymer Science
Roads impact tree and shrub productivity in adjacent boreal peatlands	Saraswati, S.| Bhusal, Y.| Trant, A.J.| Strack, M.	2020	Forests
1D 1H NMR as a Tool for Fecal Metabolomics	Ganobis, C.M.| Al-Abdul-Wahid, M.S.| Renwick, S.| Yen, S.| Carriero, C.| Aucoin, M.G.| Allen-Vercoe, E.	2020	Current Protocols in Chemical Biology
Phycodnaviruses (Phycodnaviridae)	Van Etten, J.L.| Dunigan, D.D.| Nagasaki, K.| Schroeder, D.C.| Grimsley, N.| Brussaard, C.P.D.| Nissimov, J.I.	2020	Encyclopedia of Virology: Volume 1-5, Fourth Edition

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ABCF1 Regulates dsDNA-induced Immune Responses in Human Airway Epithelial Cells	Cao, Q.T. | Aguiar, J.A. | Tremblay, B.J.M. | Abbas, N. | Tiessen, N. | Revill, S. | Makhdami, N. | Ayoub, A. | Cox, G. | Ask, K. | Doxey, A.C. | Hirota, J.A.	2020	Frontiers in Cellular and Infection Microbiology
Interactive effects of vegetation and water table depth on belowground C and N mobilization and greenhouse gas emissions in a restored peatland	Lazcano, C. | Deol, A.S. | Brummell, M.E. | Strack, M.	2020	Plant and Soil
Evaluation of groundwater bacterial community composition to inform waterborne pathogen vulnerability assessments	Chik, A.H.S. | Emelko, M.B. | Anderson, W.B. | O'Sullivan, K.E. | Savio, D. | Farnleitner, A.H. | Blaschke, A.P. | Schijven, J.F.	2020	Science of the Total Environment
Characterization of performance of full-scale tertiary membranes under stressed operating conditions	Abu-Obaid, S. | Bérubé, P. | Parker, W.J.	2020	Water Science and Technology
Effect of long-acting β-agonists/ glucocorticoids on human airway epithelial cell cytokine, transcriptomic and oxidative stress responses to cannabis smoke	Huff, R.D. | Aguiar, J.A. | Tse, W. | Stämpfli, M.R. | McConkey, B.J. | Doxey, A.C. | Hirota, J.A.	2020	ERJ Open Research
Greenhouse Gas Emissions Dynamics in Restored Fens After In-Situ Oil Sands Well Pad Disturbances of Canadian Boreal Peatlands	Lemmer, M. | Rochefort, L. | Strack, M.	2020	Frontiers in Earth Science
Benchmarking the sustainability of sludge handling systems in small wastewater treatment plants	Archer, G. | Jin, C. | Parker, W.	2020	Journal of Environmental Management
A novel C-terminal degron identified in bacterial aldehyde decarbonylases using directed evolution	Liu, Y. | Chen, J. | Khusnutdinova, A.N. | Correia, K. | Diep, P. | Batyrova, K.A. | Nemr, K. | Flick, R. | Stogios, P. | Yakunin, A.F. | Mahadevan, R.	2020	Biotechnology for Biofuels
Improved biodegradation of pharmaceuticals after mild photocatalytic pretreatment	de Wilt, A. | Arlos, M.J. | Servos, M.R. | Rijnaarts, H.H.M. | Langenhoff, A.A.M. | Parker, W.J.	2020	Water and Environment Journal
Unraveling a tangled skein: Evolutionary analysis of the bacterial gibberellin biosynthetic operon	Nett, R.S. | Nguyen, H. | Nagel, R. | Marcassa, A. | Charles, T.C. | Friedberg, I. | Peters, R.J.	2020	mSphere
Assessment of the use of mainstream iron addition for phosphorous control on H2S content of biogas from anaerobic digestion of sludges	Parker, W. | Celmer-Repin, D. | Bicudo, J. | Law, P.	2020	Water Environment Research
Sustainable management of grassland soils	McTavish, M.J. | Cray, H.A. | Murphy, S.D. | Bauer, J.T. | Havrilla, C.A. | Oelbermann, M. | Sayer, E.J.	2020	Soils and Landscape Restoration

Title	Authors	Year	Journal or Conference
Identification and characterization of the proteolytic flagellin from the common freshwater bacterium Hylemonella gracilis	Eckhard, U. | Blöchl, C. | Jenkins, B.G.L. | Mansfield, M.J. | Huber, C.G. | Doxey, A.C. | Brandstetter, H.	2020	Scientific Reports
Exploring the connection between organizations and organisms in dealing with change	Arghode, V. | Jandu, N. | McLean, G.N.	2020	European Journal of Training and Development
Methane emissions from fens in Alberta's boreal region: reference data for functional evaluation of restoration outcomes	Bienida, A. | Daté, V. | Andersen, R. | Nwaishi, F. | Price, J. | Mahmood, M.S. | Strack, M.	2020	Wetlands Ecology and Management
Determining the long-term health burden and risk of sequelae for 14 foodborne infections in British Columbia, Canada: protocol for a retrospective population-based cohort study	Majowicz, S.E. | Panagiotoglou, D. | Taylor, M. | Gohari, M.R. | Kaplan, G.G. | Chaurasia, A. | Leatherdale, S.T. | Cook, R.J. | Patrick, D.M. | Ethelberg, S. | Galanis, E.	2020	BMJ open
Key Species Superpose the Effect of Species Richness and Species Interaction on Carbon Fluxes in a Restored Minerotrophic Peatland	Hassanpour Fard, G. | Farries, E. | Bérubé, V. | Rochefort, L. | Strack, M.	2020	Wetlands
Softwood biochar and greenhouse gas emissions: a field study over three growing seasons on a temperate agricultural soil	Jiang, R.W. | Mechler, M.A.A. | Oelbermann, M.	2020	Canadian Journal of Soil Science
Slr4, a newly identified S-layer protein from marine Gammaproteobacteria, is a major biofilm matrix component	Ali, S. | Jenkins, B. | Cheng, J. | Lobb, B. | Wei, X. | Egan, S. | Charles, T.C. | McConkey, B.J. | Austin, J. | Doxey, A.C.	2020	Molecular Microbiology
Metagenome-assembled genome sequences of five strains from the Microtus ochrogaster (prairie vole) fecal microbiome	Donovan, M. | Lynch, M.D.J. | Mackey, C.S. | Platt, G.N. | Washburn, B.K. | Vera, D.L. | Trickey, D.J. | Charles, T.C. | Wang, Z. | Jones, K.M.	2020	Microbiology Resource Announcements
Correction: Cultivation and characterization of Candidatus Nitrosocosmicus exaquare, an ammonia-oxidizing archaeon from a municipal wastewater treatment system	Sauder, L.A. | Albertsen, M. | Engel, K. | Schwarz, J. | Nielsen, P.H. | Wagner, M. | Neufeld, J.D.	2020	ISME Journal
Soybean and soil responses to biochar amendment in controlled environments with elevated temperature and carbon dioxide	Jiang, R.W. | Galo, M. | Oelbermann, M.	2020	Canadian Journal of Soil Science
Complete Genome Sequence of Acidithiobacillus ferridurans JAGS, Isolated from Acidic Mine Drainage	Chen, J. | Liu, Y. | Diep, P. | Jo, A. | Nesbø, C. | Edwards, E. | Papangelakis, V. | Mahadevana, R.	2020	Microbiology Resource Announcements

Title	Authors	Year	Journal or Conference
Environmental factors of youth milk and milk alternative consumption	Butler, A.E.| Battista, K.| Leatherdale, S.T.| Meyer, S.B.| Elliott, S.J.| Majowicz, S.E.	2020	American Journal of Health Behavior
Epilithic algae from an urban river preferentially use ammonium over nitrate	Cejudo, E.| Taylor, W.D.| Schiff, S.L.	2020	International Aquatic Research
Limitation in controlling the morphology of mammalian vero cells induced by cell division on asymmetric tungsten-silicon oxide nanocomposite	Moussa, H.I.| Chan, W.Y.| Logan, M.| Aucoin, M.G.| Tsui, T.Y.	2020	Materials
Impact of mixing intensity on dissolved oxygen halfvelocity constants in a sidestream deammonification environment	Xie, B.| Jin, C.| Parker, W.J.	2020	Water Quality Research Journal
A Need for Improved Cellulase Identification from Metagenomic Sequence Data	Co, R.| Hug, L.A.	2020	Applied and Environmental Microbiology
Effects of invasion by birch on the growth of planted spruce at a post-extraction peatland	Bravo, T.G.| Brummell, M.E.| Rochefort, L.| Strack, M.	2020	Mires and Peat
Nutrient attenuation in a shallow, gravel-bed river. I. In-situ chamber experiments	Quinn, J.M.| Rutherford, J.C.| Schiff, S.J.	2020	New Zealand Journal of Marine and Freshwater Research
A study of nitric oxide dynamics in a growing biofilm using a density dependent reaction-diffusion model	Ghasemi, M.| Jenkins, B.| Doxey, A.C.| Sivaloganathan, S.	2020	Journal of Theoretical Biology
Biochar amendments for sustainable soil management	Ziadi, N.| Oelbermann, M.| Price, G.| Whalen, J.	2020	Canadian Journal of Soil Science
Reply to Comment on “Describing water treatment process performance: Why average log-reduction can be a misleading statistic” by Schmidt, P.J., Anderson, W.B., and Emelko, M.B. [Water Research 176 (2020), 115702]	Schmidt, P.J.| Anderson, W.B.| Emelko, M.B.	2020	Water Research
Impact of anaerobically digested biosolids characteristics and handling conditions on dewatering performance at multiple facilities	Bicudo, J.R.| Parker, W.J.| Higgins, M.J.| Morris, S.| Gerber, J.| Crowley, B.| Celmer-Repin, D.	2020	Water Environment Research
Using market availability data to support foodborne disease outbreak cinvestigations	Majowicz, S.E.	2020	American Journal of Public Health

Title	Authors	Year	Journal or Conference
Characterization of low temperature fouling of tertiary ultrafiltration membranes	Tao, C.| Parker, W.| Bérubé, P.	2020	93rd Water Environment Federation Technical Exhibition and Conference 2020
10 years after – the status of polybrominated diphenyl ethers (PBDE) in Canadian biosolids and their fate through solids treatment processes	Lakshminarasimman, N.| Gewurtz, S.| Parker, W.| Smyth, S.A.	2020	93rd Water Environment Federation Technical Exhibition and Conference 2020
Biofuels	Ward, V.C.A.	2020	New and Future Developments in Microbial Biotechnology and Bioengineering: Microbial Biomolecules: Properties, Relevance, and Their Translational Applications
Genome sequence of the fish brain bacterium Clostridium tarantellae	Bano, L.| Kiel, M.| Sales, G.| Doxey, A.C.| Mansfield, M.J.| Wami, H.T.| Schiavone, M.| Rossetto, O.| Pirazzini, M.| Dobrindt, U.| Montecucco, C.	2020	Microbiology Resource Announcements
Behavior of perfluoroalkyl substance in sludge processing at nine canadian sludge handling facilities	Lakshminarasimman, N.| Gewurtz, S.| Smyth, S.A.| Parker, W.	2020	93rd Water Environment Federation Technical Exhibition and Conference 2020
Two-step pathway for isoprenoid synthesis	Chatzivasileiou, A.O.| Ward, V.| Edgar, S.M.| Stephanopoulos, G.	2019	Proceedings of the National Academy of Sciences of the United States of America
Annotree: Visualization and exploration of a functionally annotated microbial tree of life	Mendler, K.| Chen, H.| Parks, D.H.| Lobb, B.| Hug, L.A.| Doxey, A.C.	2019	Nucleic Acids Research
The skin microbiome of vertebrates	Ross, A.A.| Rodrigues Hoffmann, A.| Neufeld, J.D.	2019	Microbiome
Distribution of reactive oxygen species defense mechanisms across domain bacteria	Johnson, L.A.| Hug, L.A.	2019	Free Radical Biology and Medicine

Title	Authors	Year	Journal or Conference
Targeted Diphtheria Toxin-Based Therapy: A Review Article	Shafiee, F.| Aucoin, M.G.| Jahanian-Najafabadi, A.	2019	Frontiers in Microbiology
Continuous Cell Characterization and Separation by Microfluidic Alternating Current Dielectrophoresis	Zhao, K.| Larasati| Duncker, B.P.| Li, D.	2019	Analytical Chemistry
Co-occurrence of Variants of mcr-3 and mcr-8 Genes in a Klebsiella pneumoniae Isolate From Laos	Hadjadj, L.| Baron, S.A.| Olaitan, A.O.| Morand, S.| Rolain, J.-M.	2019	Frontiers in Microbiology
Global and regional source attribution of shiga toxin-producing Escherichia coli infections using analysis of outbreak surveillance data	Pires, S.M.| Majowicz, S.| Gill, A.| Devleesschauwer, B.	2019	Epidemiology and Infection
Viscoelastic properties of crosslinked chitosan films	Khouri, J.| Penlidis, A.| Moresoli, C.	2019	Processes
Enhanced arsenic tolerance in Triticum aestivum inoculated with arsenic-resistant and plant growth promoter microorganisms from a heavy metal-polluted soil	Soto, J.| Ortiz, J.| Herrera, H.| Fuentes, A.| Almonacid, L.| Charles, T.C.| Arriagada, C.	2019	Microorganisms
Petroleum exploration increases methane emissions from northern peatlands	Strack, M.| Hayne, S.| Lovitt, J.| McDermid, G.J.| Rahman, M.M.| Saraswati, S.| Xu, B.	2019	Nature Communications
Prompt active restoration of peatlands substantially reduces climate impact	Nugent, K.A.| Strachan, I.B.| Roulet, N.T.| Strack, M.| Frolking, S.| Helbig, M.	2019	Environmental Research Letters
Proglacial freshwaters are significant and previously unrecognized sinks of atmospheric CO2	St Pierre, K.A.| St Louis, V.L.| Schiff, S.L.| Lehnherr, I.| Dainard, P.G.| Gardner, A.S.| Aukes, P.J.K.| Sharp, M.J.	2019	Proceedings of the National Academy of Sciences of the United States of America
Carbon Sequestration in Biogenic Magnesite and Other Magnesium Carbonate Minerals	McCutcheon, J.| Power, I.M.| Shuster, J.| Harrison, A.L.| Dipple, G.M.| Southam, G.	2019	Environmental Science and Technology
Cell free biosynthesis of isoprenoids from isopentenol	Ward, V.C.A.| Chatzivasileiou, A.O.| Stephanopoulos, G.	2019	Biotechnology and Bioengineering
Dissolved organic nutrients dominate melting surface ice of the Dark Zone (Greenland Ice Sheet)	Holland, A.T.| Williamson, C.J.| Sgouridis, F.| Tedstone, A.J.| McCutcheon, J.| Cook, J.M.| Poniecka, E.| Yallop, M.L.| Tranter, M.| Anesio, A.M.	2019	Biogeosciences
The impact of cigarette smoke exposure, COPD, or asthma status on ABC transporter gene expression in human airway epithelial cells	Aguiar, J.A.| Tamminga, A.| Lobb, B.| Huff, R.D.| Nguyen, J.P.| Kim, Y.| Dvorkin-Gheva, A.| Stampfli, M.R.| Doxey, A.C.| Hirota, J.A.	2019	Scientific Reports

Title	Authors	Year	Journal or Conference
Unprocessed Atmospheric Nitrate in Waters of the Northern Forest Region in the U.S. and Canada	Sebestyen, S.D. | Ross, D.S. | Shanley, J.B. | Elliott, E.M. | Kendall, C. | Campbell, J.L. | Dail, D.B. | Fernandez, I.J. | Goodale, C.L. | Lawrence, G.B. | Lovett, G.M. | McHale, P.J. | Mitchell, M.J. | Nelson, S.J. | Shattuck, M.D. | Wickman, T.R. | Barnes, R.T. | Bostic, J.T. | Buda, A.R. | Burns, D.A. | Eshleman, K.N. | Finlay, J.C. | Nelson, D.M. | Ohte, N. | Pardo, L.H. | Rose, L.A. | Sabo, R.D. | Schiff, S.L. | Spoelstra, J. | Williard, K.W.J.	2019	Environmental Science and Technology
Freshwater microbial community diversity in a rapidly changing High Arctic watershed	Cavaco, M.A. | St. Louis, V.L. | Engel, K. | St. Pierre, K.A. | Schiff, S.L. | Stibal, M. | Neufeld, J.D.	2019	FEMS Microbiology Ecology
Contemporary limnology of the rapidly changing glacierized watershed of the world's largest High Arctic lake	St. Pierre, K.A. | St. Louis, V.L. | Lehnherr, I. | Schiff, S.L. | Muir, D.C.G. | Poulain, A.J. | Smol, J.P. | Talbot, C. | Ma, M. | Findlay, D.L. | Findlay, W.J. | Arnott, S.E. | Gardner, A.S.	2019	Scientific Reports
Microbiota variations in Culex nigripalpus disease vector mosquito of west nile virus and saint louis encephalitis from different geographic origins	Duguma, D. | Hall, M.W. | Smartt, C.T. | Debboun, M. | Neufeld, J.D.	2019	PeerJ
Bioinformatic discovery of a toxin family in Chryseobacterium piperi with sequence similarity to botulinum neurotoxins	Mansfield, M.J. | Wentz, T.G. | Zhang, S. | Lee, E.J. | Dong, M. | Sharma, S.K. | Doxey, A.C.	2019	Scientific Reports
Review of phosphorus attenuation in groundwater plumes from 24 septic systems	Robertson, W.D. | Van Stempvoort, D.R. | Schiff, S.L.	2019	Science of the Total Environment
Bacterial dynamics in supraglacial habitats of the Greenland ice sheet	Nicholes, M.J. | Williamson, C.J. | Tranter, M. | Holland, A. | Poniecka, E. | Yallop, M.L. | Anesio, A. | Poniecka, E. | Benning, L. | McQuaid, J. | Lutz, S. | McCutcheon, J. | Hodson, A. | Hanna, E. | Irvine-Fynn, T. | Cook, J. | Bamber, J. | Tedstone, A. | Box, J. | Stibal, M.	2019	Frontiers in Microbiology
Anadromous arctic char microbiomes: Bioprospecting in the high arctic	Hamilton, E.F. | Element, G. | van Coeverden de Groot, P. | Engel, K. | Neufeld, J.D. | Shah, V. | Walker, V.K.	2019	Frontiers in Bioengineering and Biotechnology

Title	Authors	Year	Journal or Conference
Associating sporadic, foodborne illness caused by Shiga toxin-producing Escherichia coli with specific foods: A systematic review and meta-analysis of case-control studies	Devleesschauwer, B.| Pires, S.M.| Young, I.| Gill, A.| Majowicz, S.E.	2019	Epidemiology and Infection
Large expert-curated database for benchmarking document similarity detection in biomedical literature search	Brown, P.| et al. (over 50 authors)	2019	Database
Methane-based denitrification kinetics and syntrophy in a membrane biofilm reactor at low methane pressure	Lee, J.| Alrashed, W.| Engel, K.| Yoo, K.| Neufeld, J.D.| Lee, H.-S.	2019	Science of the Total Environment
Fast media optimization for mixotrophic cultivation of Chlorella vulgaris	Ward, V.C.A.| Rehmann, L.	2019	Scientific reports
Estimating age-specific vaccine effectiveness using data from a large measles outbreak in Berlin, Germany, 2014/15: Evidence for waning immunity	Bitzegeio, J.| Majowicz, S.| Matysiak-Klose, D.| Sagebiel, D.| Werber, D.	2019	Eurosurveillance
Designer Sinorhizobium meliloti strains and multi-functional vectors enable	Brumwell, S.L.| MacLeod, M.R.| Huang, T.| Cochrane, R.R.| Meaney, R.S.| Zamani, M.| Matysiakiewicz, O.| Dan, K.N.| Janakirama, P.| Edgell, D.R.| Charles, T.C.| Finan, T.M.| Karas, B.J.	2019	PLoS ONE
The mutual interplay between calcification and coccolithovirus infection	Johns, C.T.| Grubb, A.R.| Nissimov, J.I.| Natale, F.| Knapp, V.| Mui, A.| Fredricks, H.F.| Van Mooy, B.A.S.| Bidle, K.D.	2019	Environmental Microbiology
Access roads impact enzyme activities in boreal forested peatlands	Saraswati, S.| Parsons, C.T.| Strack, M.	2019	Science of the Total Environment
Estimating cumulative wastewater treatment plant discharge influences on acesulfame and Escherichia coli in a highly impacted watershed with a fully-integrated modelling approach	Hwang, H.-T.| Frey, S.K.| Park, Y.-J.| Pintar, K.D.M.| Lapen, D.R.| Thomas, J.L.| Spoelstra, J.| Schiff, S.L.| Brown, S.J.| Sudicky, E.A.	2019	Water Research
Validating DNA extraction protocols for bentonite clay	Engel, K.| Coyotzi, S.| Vachon, M.A.| McKelvie, J.R.| Neufeld, J.D.	2019	mSphere
Shrub abundance contributes to shifts in dissolved organic carbon concentration and chemistry in a continental bog exposed to drainage and warming	Strack, M.| Munir, T.M.| Khadka, B.	2019	Ecohydrology

Title	Authors	Year	Journal or Conference
An engineered GFP fluorescent bacterial biosensor for detecting and quantifying silver and copper ions	Martinez, A.R. | Heil, J.R. | Charles, T.C.	2019	BioMetals
Phylogeny of the egg-loving green alga Oophila amblystomatis (Chlamydomonadales) and its response to the herbicides atrazine and 2,4-D	Nema, M. | Hanson, M.L. | Müller, K.M.	2019	Symbiosis
Microbial community succession and nutrient cycling responses following perturbations of experimental saltwater aquaria	Bik, H.M. | Alexiev, A. | Aulakh, S.K. | Bharadwaj, L. | Flanagan, J. | Haggerty, J.M. | Hird, S.M. | Jospin, G. | Lang, J.M. | Sauder, L.A. | Neufeld, J.D. | Shaver, A. | Sethi, A. | Eisen, J.A. | Coil, D.A.	2019	mSphere
Enhancing food security in subarctic canada in the context of climate change: The harmonization of indigenous harvesting pursuits and agroforestry activities to form a sustainable import-substitution strategy	Tsuji, L.J.S. | Wilton, M. | Spiegelaar, N.F. | Oelbermann, M. | Barbeau, C.D. | Solomon, A. | Tsuji, C.J.D. | Liberda, E.N. | Meldrum, R. | Karagatzides, J.D.	2019	Sustainable Solutions for Food Security: Combating Climate Change by Adaptation
Controls on soil carbon dioxide and methane fluxes from a peat swamp vary by hydrogeomorphic setting	Davidson, S.J. | Strack, M. | Bourbonniere, R.A. | Waddington, J.M.	2019	Ecohydrology
Transcriptomic and barrier responses of human airway epithelial cells exposed to cannabis smoke	Aguiar, J.A. | Huff, R.D. | Tse, W. | Stämpfli, M.R. | McConkey, B.J. | Doxey, A.C. | Hirota, J.A.	2019	Physiological Reports
Carbon dioxide emissions: Spatiotemporal variation in a young and mature riparian forest	De Carlo, N.D. | Oelbermann, M. | Gordon, A.M.	2019	Ecological Engineering
Can Improved Flow Partitioning in Hydrologic Models Increase Biogeochemical Predictability?	Shafii, M. | Craig, J.R. | Macrae, M.L. | English, M.C. | Schiff, S.L. | Van Cappellen, P. | Basu, N.B.	2019	Water Resources Research
Biochemical diversity of glycosphingolipid biosynthesis as a driver of Coccolithovirus competitive ecology	Nissimov, J.I. | Talmy, D. | Haramaty, L. | Fredricks, H.F. | Zelzion, E. | Knowles, B. | Eren, A.M. | Vandzura, R. | Laber, C.P. | Schieler, B.M. | Johns, C.T. | More, K.D. | Coolen, M.J.L. | Follows, M.J. | Bhattacharya, D. | Van Mooy, B.A.S. | Bidle, K.D.	2019	Environmental Microbiology
Degradation of Perfluorooctane Sulfonamide by Acinetobacter Sp. M and Its Extracellular Enzymes	Hao, J. | Wang, P. | Kang, Y. | He, H. | Luo, H. | Kim, S. | Niu, L. | Jiang, H. | Ma, K.	2019	Chemistry - An Asian Journal
Road Crossings Increase Methane Emissions From Adjacent Peatland	Saraswati, S. | Strack, M.	2019	Journal of Geophysical Research: Biogeosciences

Title	Authors	Year	Journal or Conference
Hydrogeologic setting overrides any influence of wildfire on pore water dissolved organic carbon concentration and quality at a boreal fen	Davidson, S.J. | Elmes, M.C. | Rogers, H. | van Beest, C. | Petrone, R. | Price, J.S. | Strack, M.	2019	Ecohydrology
Food Safety Education Needs of High-School Students: Leftovers, Lunches, and Microwaves	Diplock, K.J. | Jones-Bitton, A. | Leatherdale, S.T. | Rebellato, S. | Hammond, D. | Majowicz, S.E.	2019	Journal of School Health
Assessing the impact of fertilizer application on net soil-derived emission budgets from a temperate willow (Salix miyabeana) short rotation coppice system	Lutes, K. | Oelbermann, M. | Thevathasan, N.V. | Gordon, A.M.	2019	Biomass and Bioenergy
Spatial and temporal variation in soil nitrous oxide emissions from a rehabilitated and undisturbed riparian forest	De Carlo, N.D. | Oelbermann, M. | Gordon, A.M.	2019	Journal of Environmental Quality
Phosphorus and nitrogen loading to Lake Huron from septic systems at Grand Bend, ON	Baer, S. | Robertson, W. | Spoelstra, J. | Schiff, S.	2019	Journal of Great Lakes Research
The influence of Carex aquatilis and Juncus balticus on methane dynamics: A comparison with water sourced from a natural and a constructed fen	Murray, K.R. | Yi, M. | Brummell, M.E. | Strack, M.	2019	Ecological Engineering
Quantifying the fate of wastewater nitrogen discharged to a Canadian river	Venkiteswaran, J.J. | Schiff, S.L. | Ingalls, B.P.	2019	Facets
Interpreting medieval mobility from burials at the rock-hewn church of St. Georges, Gurat (France): Insights from strontium isotope analysis of bones and teeth	Meijer, J. | Dolphin, A.E. | Yakymchuk, C. | Gervers, M.	2019	International Journal of Osteoarchaeology
Differential capacitance of ionic liquid interface with graphene: The effects of correlation and finite size of ions	Shalabi, A. | Daniels, L. | Scott, M. | Mišković, Z.L.	2019	Electrochimica Acta
Design, synthesis and photocytotoxicity of upconversion nanoparticles: Potential applications for near-infrared photodynamic and photothermal therapy	Hu, Y. | Honek, J.F. | Wilson, B.C. | Lu, Q.-B.	2019	Journal of Biophotonics
Component characterization in a growth-dependent physiological context: Optimal experimental design	Braniff, N. | Scott, M. | Ingalls, B.	2019	Processes

Title	Authors	Year	Journal or Conference
Ultraviolet irradiation of trypsin, lysozyme and β-galactosidase: how does UVC affect these enzymes when used as a secondary barrier against adventitious agents?	Gabriel, M.A. | Dare, E.V. | Meunier, S.M. | Campbell, J.L. | Sasges, M.R. | Aucoin, M.G.	2019	Vaccine
A flow cytometric granularity assay for the quantification of infectious virus	Logan, M. | Manalil, J. | Notte, C. | Kearse, C. | George, S. | Zeiser, A. | Farrell, P. | Aucoin, M.G.	2019	Vaccine
Optimal Experimental Design for a Bistable Gene Regulatory Network	Braniff, N. | Richards, A. | Ingalls, B.	2019	IFAC-PapersOnLine
Effect of solids residence time on dynamic responses in chemical P removal	Conidi, D. | Parker, W.J. | Smith, S.	2019	Water Environment Research
Exploring the evolution of virulence factors through bioinformatic data mining	Doxey, A.C. | Mansfield, M.J. | Lobb, B.	2019	mSystems
Long-term changes in nutrient dynamics and plankton communities following the creation of a new reservoir	Paterson, M.J. | Beaty, K.G. | Findlay, D.L. | Findlay, W.J. | Schiff, S.L. | St.louis, V.L. | Venkiteswaran, J.J.	2019	Canadian Journal of Fisheries and Aquatic Sciences
Evolution of Dissolved Organic Matter Along a Septic System Plume: Evidence of Sustained Biogeochemical Activity in the Groundwater Zone	Aukes, P.J.K. | Schiff, S.L. | Robertson, W.D.	2019	Journal of Geophysical Research: Biogeosciences
Preliminary characterization of a Ni2+-activated and mycothiol-dependent glyoxalase I enzyme from streptomyces coelicolor	Suttisansanee, U. | Honek, J.F.	2019	Inorganics
Pygenprop: A Python library for programmatic exploration and comparison of organism genome properties	Bergstrand, L.H. | Neufeld, J.D. | Doxey, A.C.	2019	Bioinformatics
Anatoxin-a adsorption by virgin and preloaded granular activated carbon	Vlad, S. | Peldszus, S. | Anderson, W.B. | Huck, P.M.	2019	AWWA Water Science
Does a carbonatite deposit influence its surrounding ecosystem?	Jones, J.M.C. | Webb, E.A. | Lynch, M.D.J. | Charles, T.C. | Antunes, P.M. | Guinel, F.C.	2019	Facets
Clicker student response systems: Dedicated physical devices or web-enabled systems that allow student to bring their own device (ByoD)	Jandu, N.	2019	Journal of Microbiology and Biology Education
Theory and applications of proteomics	McConkey, B.J.	2019	Comprehensive Biotechnology

Title	Authors	Year	Journal or Conference
Characterization of fouling of tertiary membranes	Abu-Obaid, S.| Parker, W.| Berube, P.	2019	91st Annual Water Environment Federation Technical Exhibition and Conference
A method for design of expression tracking controllers for gene regulatory networks	Mori, Y.| Kuroe, Y.| Ingalls, B.	2019	IFAC-PapersOnLine
Teaching resources, microbiology	Jandu, N.	2019	Encyclopedia of Microbiology
Physical-chemical characterization of “black bag” waste in a municipality	Anderson, W.A.| Chandler, J.| Sawell, S.| Parker, W.	2019	Proceedings of the Air and Waste Management Association's Annual Conference and Exhibition
Evaluating the performance of a post-translational dynamic metabolic control system	Kadam, K.| Euler, C.K.| Mahadevan, R.	2019	IFAC-PapersOnLine
Use of Multi-collector ICP-MS for Studying Biogeochemical Metal Cycling	Liu, K.| Wu, L.| Schiff, S.L.	2019	Analytical Geomicrobiology: A Handbook of Instrumental Techniques
Benchmarking the sustainability of sludge-handling systems in small wastewater treatment plants in Ontario	Archer, G.| Jin, C.| Parker, W.	2019	91st Annual Water Environment Federation Technical Exhibition and Conference

8 Appendix C: WCMR Consitution

Waterloo Centre for Microbial Research

University of Waterloo

STRUCTURE AND CONSTITUTION

1 MISSION OF WCMR

The Waterloo Centre for Microbial Research (WCMR) at the University of Waterloo was formed in 2017 to promote research and education in the application of microbiology principles and techniques to address environmental, industrial, and human health challenges. The WCMR promotes synergy among its researchers, provides efficient access to shared central services, such as equipment and technical support for research, and serves as a focal point for research interactions with industry, government, biomedical, and other external organizations.

2 MEMBERSHIP IN WCMR

There are two types of academic memberships in WCMR, *Regular Members* and *Student Members*. Membership as Regular Members is open and will be granted to faculty members in the Faculties of Science, Engineering, Environment, Mathematics, and Health who have research interests related to microbiology. Membership of faculty members outside of these Faculties is strongly encouraged, and these memberships will be granted by approval of the Director or one of the Associate Directors. Again, these memberships are highly encouraged and expected to be virtually automatic. Student Memberships are also highly encouraged and will be granted upon the endorsement of a Regular Member of the WCMR.

2.1 Obligations of Membership and Financial Support

There are three other forms of WCMR membership. *Institutional Associates* are representatives of entities such as professional schools, research institutes, and government bodies. *Corporate Associates* are firms or agencies active in the research, development, or application of WCMR research and, for a nominal per year fee (established by the Executive Committee), obtain notices of seminars, VIP invitations to research symposia, and research results updates. A third category recognizes *Key Partners* who are noted for their extraordinary contribution to the Centre in one or a combination of financial support, facility support, or educational support. Key Partners receive

similar Centre services as institutional and corporate partners but may receive special mention on the WCMR website or advertising materials.

2.2 Role of Groups

Synergy is the major motivating factor for WCMR. Intellectual synergy is facilitated by the open individual membership in WCMR and its promotion of a healthy research environment. Part of this process is the initiation of research collaborations of a transitory nature, where research synergy extends over limited time frames such as the conduct of a single project or the creation of one research paper. In other circumstances, the "organizational synergy" required to acquire and manage laboratories with large, specialized requirements for hardware and technical support results in the emergence of more formal entities such as research clusters.

The mandate of WCMR is admittedly broad and as such there is a need for research groups in specific topic areas. A formal entity within WCMR is possible for groups primarily concerned with research in a specific topic area, wishing to have formal recognition and designation of such. Such groups are called **Federated Groups of WCMR**. This status is conferred by decision of the Board of Directors on a three-year renewable basis.

There is a clear need to coordinate the activities and interactions of research clusters, as formal entities, in areas such as the cooperative acquisition, administration, and central facility support. In this way, WCMR can provide efficient access to many services by eliminating duplication. Such shared services might be document preparation, report distribution, developing external partnerships, advice on grant applications and proposals, and a public relations interface both on and off the campus.

WCMR should be able to provide such services in a more cost-effective way than could be achieved through fragmented local development. Viewed in this way, the relations between research groups within partnered Faculties and WCMR may be as close or as distant as seems appropriate to the group concerned. The federation of the groups with WCMR and individual membership in WCMR are separate issues.

In its current conception, the Centre is not expected to provide seed research funding to its members, but rather to facilitate members in obtaining funding from other sources. Should the Centre reach a point where it can offer funding or grants to its members, a proposal process will be established whereby members apply formally for funding and proposals are reviewed by a selection committee.

Non-federated research groups within the University should have access to WCMR services or facilities on a fee-for-service basis, negotiable with the Director of WCMR and the appropriate WCMR researchers where relevant.

3 GOVERNANCE

The governance structure is outlined in Figure 1.

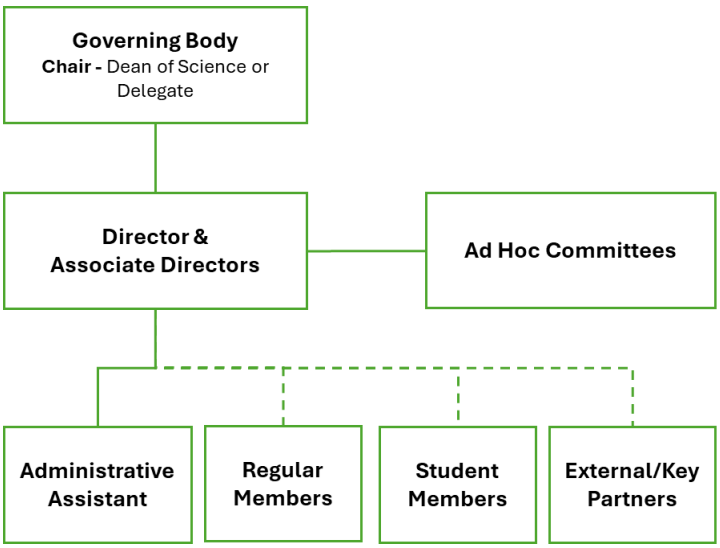

Figure 1. WCMR Administrative Structure

4 OFFICERS AND EXECUTIVE COMMITTEE

Director

The WCMR Director reports directly to the Dean of Science. The Director is aided in fulfilling the mission of the WCMR by the Associate Directors and the Administrative Assistant which constitute the Executive Committee. The Governing Body provides input on the direction, strategic planning and operations of the WCMR.

The terms of office for the Director will normally be for an initial period of three years, renewable for an additional term of three years. Unless warranted by exceptional circumstances, a director shall not serve for more than two terms consecutively. The appointment or peremptory removal of the Director will occur in accordance with the procedure included in Section 6.

Associate Directors & Executive Committee

The Director will be assisted by the Associate Directors who will each be responsible for the detailed direction and support of the Centre's research activities, including research-related workshops, seminars, and public lectures. The Director will appoint the Associate Directors for 3-year terms. Associate Directors can be renewed for up to 2 consecutive terms. The Executive Committee is composed of the Director, Associate Director, and Administrative Assistant.

5 GOVERNING BODY

The composition of the Governing Body is:

- Dean of Science or a Delegate (Chair)
- Director of WCMR (1)
- Associate Directors (2)
- One regular member from each Faculty (Science, Engineering) with more than 5 regular members (2)
- One regular member from Faculties with less than 5 regular members (Math, Environment, Health) (1)
- Representatives from the WCMR Key/External Partners (0-2)
- One graduate student member (1)
- One undergraduate student member from WCMR supported clubs/teams (1)
- Director of the Waterloo Centre for Genomic Surveillance (1)

The Dean of Science or their delegate will be appointed chair of the governing body and cannot be the Director or Associate Directors. Governing body meetings will be announced at least one month in advance with an agenda indicating any decision items and all necessary background material. The governing body will meet a minimum of once per year.

The Director of the WCMR is accountable to the Governing Body and the Dean of Science for the operational management of WCMR, preparation of its annual budget, supervision of staff members, and guiding the research and outreach agenda, consistent with policies established by the Board and with input from the Centre's membership.

The Governing Body is responsible for the selection of a new director in accordance with the appointment process in Section 6.

5.1 Procedure for Governing Body Appointments

For the regular, student, and key/external partner board members, the term shall be two years with staggered yearly elections to ensure continuity. No members of the WCMR shall stand for election if they expect to be away from campus for sabbatical or other reasons for a large portion of their term in office. Nominations will be solicited from the membership and elections will be held by email ballot.

The Governing Body shall seek recommendations for the 0-2 WCMR Key Partners or External Partners from the existing partnerships, or else suggest nominations of new partners to the membership for ratification by email ballot.

6 OTHER ROLES AND COMMITTEES

Administrative Assistant

An administrative assistant will be hired to manage the Centre's operations, provide organizational and logistical support, and serve as the initial point of contact between the Centre and internal/external individuals and organizations.

Standing and Ad Hoc Committees

Standing and Ad Hoc Committees are established by the Executive Committee or Governing Body to provide advice to fulfill a specified role such as selection of award recipients, organization of large workshops, as needed.

7 SELECTION AND REMOVAL OF THE WCMR DIRECTOR

7.1 Qualifications, Duties and Responsibilities

The Centre Director will be a person of academic stature, appointed for her/his intellectual and administrative abilities, devotion to education and research, and qualities of leadership. The Centre Director will be a tenured Associate or Full Professor from the regular membership who has the ability to create an environment conducive to the growth of intellectual life within members of the Centre and to maintain the confidence and co-operation of her/his colleagues.

The Centre Director has the dual role of representing the Centre's policies and points of view, and, as an officer of the Centre, making independent judgments on total Centre matters. The Centre Director will report directly to the Dean of the Faculty of Science.

Within the Centre, the Centre Director is responsible for providing academic and administrative leadership. In providing this leadership the Centre Director shall consult with the members of the Centre, providing them with an adequate basis of information concerning its operations, and ascertaining their views and ideas concerning the various aspects of Centre operations. The principal duties of a Centre Director shall include the advancement of the research mission of the Centre, the upholding of the highest academic standards, the management of the Centre budget, the implementation of Centre activities, and the oversight of the Centre's support staff. The procedures followed by the Centre Director in all matters shall of course be governed by prevailing Faculty practices and University policies. Significant changes to Centre practices or procedures should not be made without wide consultation.

The Centre Director may recommend the appointment of one or more Associate Directors to assist in these tasks.

7.2 2. Term of Office

The first term of office for the Centre Director is up to three years, renewable for up to three years, to a maximum of six years. Reappointment beyond a second consecutive term should be considered unusual and will occur only if there are compelling reasons, as specified by the nominating committee, along with strong support throughout the Centre.

The Centre Director's performance is reviewed annually by the Dean. With the prior knowledge of the Centre Director, the Dean may seek confidential input from the faculty and staff of the Centre by any means they deem appropriate.

In the event of the Centre Director's absence for any prolonged period, arrangements should be made for the Dean to appoint an Acting Centre Director for a period of no more than one year.

If the office of the Centre Director becomes unexpectedly vacant, through death, resignation, or other causes, it is the Dean's responsibility to appoint, after appropriate consultation, an interim Centre Director and to initiate the process of filling the vacancy. The term of office of the interim Centre Director should be of sufficient length for the nominating committee to complete its task and, normally, should not normally exceed one year. The appointment of an untenured faculty member to an acting or interim position would be unusual but is not ruled out.

7.3 Appointment and Reappointment Procedures

The Dean of Science or their representative, shall begin the process for appointment or reappointment of the WCMR Director by forming a nominating committee no earlier than 18 months and no later than 1 year before the end of the existing term of the incumbent.

The nominating committee shall be chaired by the Dean of Science and consist of all of the Governing Body members (minus the Director) and one member appointed by the Vice-President, Academic & Provost as an ex officio, non-voting member. All members of the Governing Body are elected by the membership to guide the operations and direction of the WCMR and include regular members and external partners. One or more regular WCMR member can be added to the nominating committee to maintain a reasonable gender balance at the discretion of the chair.

Membership on nominating committees shall be conditional on each person agreeing to maintain in confidence the information discussed by the committee except on points where the committee subsequently agrees otherwise, and to exercise authority and responsibility as an individual in order that decisions may be taken at the time and place of the committee meetings.

In voting, the "double majority" rule shall be enforced such that a successful candidate must have majority support from all voting members of the committee as well as majority support from the regular members in the committee.

If any member of the nominating committee becomes, or seeks to become, a candidate for the Office of Centre Director, the member shall resign from the committee. In the event of a perceived conflict of interest that could compromise or be seen to compromise the member's judgment of the candidates, he/she shall disclose the nature of the conflict to the committee in sufficient detail to enable the committee to determine whether the member must resign from the committee.

If the association of any members of the nominating committee with the University is terminated or in any way significantly altered, or if for any reason, including resignation, any member is unable to carry out responsibilities on the committee, the nominating committee will request a replacement member, unless the committee has reached the stage in its deliberations where it deems such a replacement inadvisable.

B. Terms of Reference

It is understood that the committee shall be responsible for soliciting the views of those affected, by ballot or otherwise, including part-time and non-regular faculty members, staff and student members of the Centre.

Reappointment of Incumbent. The first charge to the Nominating Committee will be to solicit, with the prior knowledge of the incumbent and by whatever means it may decide, the opinion of members of the Centre, with respect to the reappointment of the incumbent. If the incumbent is found by the Nominating Committee to be generally acceptable by means of separate secret email ballots of regular faculty and staff members of the Centre, the Dean shall then determine the incumbent's willingness to accept reappointment.

If the Centre wishes reappointment and the incumbent wishes to continue, the Dean shall forward a recommendation for reappointment to the Vice-President, Academic & Provost who, if he/she approves, will forward the recommendation to the President. The President shall forward it to the Board of Governors for information.

New Appointments. If the incumbent is not to be recommended for reappointment at the end of a first term, or if the incumbent is nearing the end of a second term, or if the incumbent has died, resigned or been removed, then the following procedure shall be followed. The committee will invite nominations, by whatever means it considers appropriate, from any person or group; it will advertise the position, internally and externally; and it will establish criteria against which nominations and applications may be measured. There may be circumstances where the appointment of an external candidate would present significant resource challenges for the unit and the Faculty of Science. In such situations, or when the Dean feels there are compelling reasons for an internal appointment, the Dean will determine in consultation with the Nominating Committee and the Vice-President, Academic & Provost whether to restrict the search to internal candidates. When external candidates are included in the search, the procedures are to be consistent with those for faculty hiring in general (see Policy 76).

The committee shall invite the members of the Centre and other interested persons to submit nominations, and it shall be responsible for the initial selection of suitable candidates. These candidates will be invited to meet with the committee at the committee's discretion, and to make themselves available to members of the Centre. After screening candidates, the committee shall select the person it regards as most suitable for the position, and shall submit its recommendation for the appointment of that candidate to the Centre. However, if the committee feels that two or more of the candidates are well qualified, it may choose to submit the choice between these to the members of the Centre.

The regular faculty and staff members of the Centre will then have the opportunity to indicate the acceptability of each candidate, and their choice among candidates, in separate secret mail ballots which shall be returned to the Chair of the nominating committee. The results of the ballots shall be made known to the nominating committee, who shall decide what constitutes an acceptable level of support, subject to the expectation that a candidate normally will be acceptable to a majority of voting regular faculty members as well as a majority of voting staff members of the Centre.

If the Committee concludes that no candidate is acceptable, it shall resume its screening activities. Otherwise, the nominating committee shall recommend the appointment of a candidate to the Vice-President, Academic & Provost. If the Centre generally approves a candidate, the nominating committee shall recommend the appointment of the candidate to the Vice-President, Academic &

Provost. When more than one candidate is generally acceptable and the ballot results indicate no clear preference, the nominating committee shall select the person it regards as most suitable for the position and recommend the appointment to the Vice-President, Academic & Provost.

The Vice-President, Academic & Provost, if he/she approves, will forward the recommendation to the President. The President shall forward it to the Board of Governors for information. If the Vice-President, Academic & Provost does not concur with the recommendation, he/she will meet with the nominating committee and/or the Centre, to provide reasons.

Note: If, in the opinion of the Dean of the Faculty and the Vice-President, Academic & Provost, the Centre is in such a state that reasonable doubt arises concerning the capacity of the Centre to render a judgment in the selection of a Centre Director which reflects a mature and experienced scholarly perspective, a procedure of selection alternative to the one cited above shall be employed. In such cases, the precise procedure employed shall be at the discretion of the Dean of the Faculty and the Vice-President, Academic & Provost, involving appropriate consultation with members of the Centre.

It is expected that the circumstances which would warrant the resort to such extraordinary procedures will occur only rarely.

7.4 4. Removal of the Office Holder Before Expiration of Term

A. General Principles

A Centre Director may only be removed from office for cause. Cause is to be understood in relation to the duties of the Centre Director as indicated by all relevant University policies. Causes for removal include negligence, incompetence, unprofessional conduct, and inability to maintain the confidence of the members of the Centre. Dismissal for cause from an administrative position is not to be confused with the dismissal for cause of a tenured faculty member. The criteria used and the procedures to be followed are different.

B. Reconciliation

In cases where a Dean becomes aware of serious problems in a Centre, for example through individual submissions or a general petition of regular Centre members, the Dean will, where appropriate and with the support of the Vice-President, Academic & Provost, seek to mediate the situation as early as possible. Especially in cases of widespread disaffection or dissatisfaction with the Centre Director, the process of reconciliation may involve the holding of a Centre meeting, normally chaired by the Dean, for a full and frank discussion of concerns.

C. The Setting-Up of a Formal Inquiry

If the process of reconciliation fails or is inappropriate, the Dean should determine whether there is sufficient evidence to warrant an inquiry into whether there is cause for removal. The Centre Director will be informed in writing of the Dean's decision and the basis for it, and be given an opportunity to respond. The Dean will then bring the evidence, together with the Centre Director's response, before the Vice-President, Academic & Provost. If the Vice-President, Academic & Provost believes that formal proceedings are necessary, he or she will set up a formal inquiry. At the same time, the Vice-President, Academic and Provost may choose to suspend the Centre Director, without prejudice, financial or otherwise, for the period of the inquiry, if this is warranted

by the general interests of the Centre and of the individuals involved, and is compatible with principles of natural justice. In the case of suspension, the Vice-President, Academic & Provost will appoint an Acting Centre Director so as to facilitate the operation of the Centre during this period.

D. Formal Inquiry

The Vice-President, Academic & Provost, will appoint a committee of three senior faculty members from outside the Centre concerned and inform the Centre Director. The Centre Director may challenge, in writing, a member or members of the committee for bias, apprehension of bias or conflict of interest.

The committee shall determine its own procedures. However, in all its proceedings it shall be guided by principles of natural justice. In particular, it shall make sure that the Centre Director has full knowledge of every charge, and has every opportunity to respond to these charges. On completion of its work the committee shall report to the President with a recommendation, supported by reasons, that the Centre Director either (1) continue in office (or be reinstated if temporary suspension has occurred), or (2) be removed for cause. The President will then take appropriate action. The report of the committee shall be made available to the Centre Director, the Dean, and, at the discretion of the committee, to other concerned parties within the Centre.

10. Conflict of Interest

All Centre activities are subject to UW conflict of interest policies as specified in Policy #69.

9 Appendix D: Letters of Support

Dean of Science

Dean of Engineering

Dean of Math

Dean of Environment

Dean of Health

UNIVERSITY OF WATERLOO

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February 18, 2025

Professor Charmaine Dean
Vice President, University Research
University of Waterloo

Re: Support for WCMR renewal application

Dear Professor Dean,

I am writing this letter to express my enthusiastic support for the renewal of the Waterloo Centre for Microbial Research (WCMR). The WCMR promotes microbial research and education throughout all six faculties on campus. The WCMR has been very effective at engaging members, graduate students, and undergraduate students interested in microbiomes, microbial research, metagenomics, synthetic biology, and biomanufacturing with a breadth of applications from waste management to health surveillance.

Over the last 5 years, WCMR members have been effective in working together to obtain several large collaborative research grants and provide technical workshops for faculty, staff, trainees, and students filling an important need for the community. The WCMR is working with the Waterloo Genomic Surveillance Centre to promote its services and obtain funding for new equipment to increase Waterloo's capacity to conduct state-of-the-art research in microbial surveillance and support Waterloo researchers with collaborations for data analysis.

The WCMR is also facilitating mentorship of new faculty members with more established WCMR members to ensure early access to equipment, resources, events, and opportunities for collaborations. These activities have help to create strong interdisciplinary teams within the WCMR who are ready to engage in new projects as they are announced. For example, the WCMR has been a key part of the development of a national pathogen surveillance program which formed during the pandemic and was built from preexisting collaborations. The research directions of the WCMR directly align with all of the Faculty of Science's thematic research areas including Health and Biomedical Sciences, Environment and Ecology, Sustainable Materials and Sensing, and Discovery and Exploration. This year,

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the Faculty of Science will be committing $37,500 to support the WCMR and we hope that the other Faculties will contribute proportionatily and that the University of Waterloo will continue to support this important Centre.

I look forward to the continued development and growth of the relationship between Science and the WCMR at the University of Waterloo.

Sincerely,

Dr. Chris Houser
Dean, Faculty of Science
Professor, Department of Earth and Environmental Science
University of Waterloo

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UNIVERSITY OF WATERLOO

Feb 18, 2025

Professor Charmaine Dean
Vice President, University Research
University of Waterloo

Re: Support for WCMR renewal application

Dear Professor Dean,

I am writing this letter to express my strong support for the renewal of the Waterloo Centre for Microbial Research (WCMR). The WCMR promotes microbial research and education throughout all six faculties on campus. Over the last 5 years, the WCMR has built strong interdisciplinary connections between each faculty including Engineering. As a result, they have engaged the university in a number of research and training initiatives that will strong benefit our undergraduate and graduate students including BioHubNet, a national biomanufacturing training network.

The WCMR has been engaged in many of the types of activities I would like to see Centres engaging in, including involving undergraduate and graduate students in their activities through the two student teams sponsored by the WCMR (iGEM and WatSAM). This helps connect faculty members with incoming graduate students and strengthens the sense of community at Waterloo. Community is a key pillar of our Engineering Strategic Plan.

The WCMR has also been facilitating collaborations through regular events and networking opportunities to support new faculty members on campus. These activities have helped to create strong interdisciplinary teams within the WCMR who are ready to engage in new projects as they are announced. For example, the WCMR has been a key part of obtaining new shared infrastructure that supports researchers throughout campus and forming multidisciplinary teams to engage in large grant opportunities like the NSF Global Centres initiative recently funded for development of the Circular Economy.

I look forward to the continued development and growth of the relationship between Engineering and the WCMR at the University of Waterloo.

Sincerely,

Mary Wells

Mary Wells
Dean of Engineering

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February 28, 2025

Professor Charmaine Dean
Vice President, Research and International
University of Waterloo

Re: Support for WCMR renewal application

Dear Professor Dean,

I am writing to provide my support for the renewal of Waterloo Centre for Microbial Research (WCMR).

At the University of Waterloo, WCMR promotes research and education in the application of microbial principles and techniques to address environmental, industrial, economic, and human health challenges. During the past 5-years, the WCMR has built strong connections with all Faculty's across campus including Environment. This engagement is in line with our Environment's priorities to connection, communicate, and collaborate within and beyond our campus community. Natural connections across some of our core areas of research include climate change and natural resources, especially in the area of soil ecosystems.

Through their activities and initiatives, the WCMR has been connecting faculty members with student trainees (through WCMR sponsored groups iGEM and WatSAM) across campus, and strongly supportive of new faculty members. The WCMR has a regular newsletter, email list, and hosts events (e.g., open house, research talks, and trainee events) to foster collaborations and build a sense of community. Transdisciplinary collaboration is a key facet of our priorities within the Faculty of Environment. As strong evidence of their evidence of their activities, the WCMR has been successful in engaging teams for grants such as NSF Global Centers.

The Faculty of Environment is pleased to continue to support WCMR and the involvement of our faculty members [n.b.: members include M. Oelbermann and M. Strack], as this will continue to foster collaborations across campus with the exchange of ideas, collaboration on grants, and mutual support of trainees.

Sincerely,

Bruce Frayne
Dean, Faculty of Environment
University of Waterloo
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Waterloo, Ontario N2A 3G1

UNIVERSITY OF WATERLOO

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Dr. Mark Giesbrecht
Dean, Faculty of Mathematics
University of Waterloo
Email: deanmath@uwaterloo.ca

March 20, 2025

Professor Charmaine Dean
Vice President, Research and International
University of Waterloo

Dear Professor Dean,

I am writing to express my support for the renewal of the Waterloo Centre for Microbial Research (WCMR). WCMR promotes research and education in the application of microbial principles and techniques to address environmental, industrial, economic, and human health challenges.

The WCMR has a strong connection with mathematics as interdisciplinary research at Waterloo expands in the fields of bioinformatics, health surveillance, and systems biology modeling. For the WCMR members within the Math faculty, the centre's activities have been valuable in promoting research across disciplines and building connections between faculty, students, and research collaborators.

I would be happy to see the WCMR renewed for another term and look forward to its growth and evolution over the next five years as a research centre here at the University of Waterloo.

Yours truly,

Mark Giesbrecht
Professor and Dean
Faculty of Mathematics

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UNIVERSITY OF WATERLOO | FACULTY OF HEALTH

March 4, 2025

Professor Charmaine Dean
Vice President, Research and International
University of Waterloo

Re: Support for WCMR renewal application

Dear Professor Dean,

I am writing to express my support for the renewal of Waterloo Centre for Microbial Research (WCMR). WCMR promotes research and education in the application of microbial principles and techniques to address environmental, industrial, economic, and human health challenges.

WCMR has historically had a strong connection with Health sciences due to the nature of microbiology and health being deeply intertwined. We are eager to further engage the health community by encouraging and promoting ongoing and new connections through WCMR membership and events that are targeted to a broader interdisciplinary audience as well. We are hoping to further engage the health community in developing this connection, and in the process undoubtedly forge new interdisciplinary research collaborations in the coming year(s).

The activities of the WCMR directly align with Faculty of Health research areas in terms of prevention, surveillance, and systems level approaches. These alignments are related to some of the research activities with our Faculty that align with WCMR's activities in pathogen genomics, surveillance, microbiome research, and food safety activities. The Faculty of Health is pleased to support the involvement of our members [n.b.: members include S. Majowicz, Z. Butt, and pending new member C. Oga-Omenka] in WCMR. Their involvement and activities will continue to foster interdisciplinary collaborations across campus with the exchange of ideas, collaboration on grants, and mutual support of trainees.

The Faculty of Health is happy to continue to support WCMR and the involvement of our faculty members, as this will continue to foster collaborations across campus with the exchange of ideas, collaboration on grants, and mutual support of trainees. I look forward to the continued development and growth of the relationship between Health and the WCMR at the University of Waterloo.

Sincerely,

Lili Liu, Dean