



McGill

Faculty of
Medicine and
Health Sciences

Faculté de
médecine et des
sciences de la santé

Committee for Oversight of Research Units

Annual Reporting for Faculty Supported Research Centres and Networks

All Centres (provisional Centres; McGill Centres), Research groups and Networks that receive funding from the Faculty of Medicine and Health Sciences (FMHS) are required to provide an annual report to the Committee for Oversight of Research Units ([CORU](#))

The reporting period is May 1, 2021 – April 30, 2022.

Please submit your report to the Research Office, Faculty of Medicine and Health Sciences (riac.med@mcgill.ca) before the following deadline:

Monday, May 2, 2022

Continued support from the Faculty is contingent on:

1. the receipt of the reporting documents on time,
2. the evaluation of reported activities by the Faculty's Committee for Oversight of Research Units (CORU),
3. the availability of Faculty funds.

Your strong engagement in the Faculty's mission for continued research excellence and financial stewardship is truly appreciated.

Annual Report of Activities and Outcomes

1. Name of the Unit: The McGill Centre for Microbiome Research

2. Name of Unit leader & email address:

Irah King, PhD

Associate Professor, Dept. of Microbiology & Immunology

Canada Research Chair in Barrier Immunity

Meakins-Christie Laboratories, Research Institute of the McGill University Health Centre

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<https://www.meakinsmcgill.com/king/>

Extended governance:

Assistant Director

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Assistant Professor, Dept. of Microbiology & Immunology

Canada Research Chair in Gut Microbial Physiology

CIFAR Azrieli Global Scholar, Humans & Microbiome Program

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Centre Program Manager

Cynthia Faubert

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MI4 Microbial Genomics Research Platform

Director

Ken Dewar, PhD

Associate Professor, Department of Human Genetics

McGill Genome Centre, 740 avenue Dr-Penfield

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MI4 Gnotobiotic Animal Research Platform

Director

Irah King, PhD
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Canada Research Chair in Barrier Immunity
Meakins-Christie Laboratories, Research Institute of the McGill University Health Centre
1001 Decarie Blvd, EM2.2232
Montreal, QC H4A 3J1
<https://www.meakinsmcgill.com/king/>

3. If the Unit is a Senate-approved McGill Research Centre, indicate date of approval:

Our Centre received provisional status on December 21, 2020. We are planning on submitting our full status application by the end of the current year.

4. Mission statement of the Unit (~ 2 sentences):

The mission of the McGill Centre for Microbiome Research is to provide McGill investigators and their partners with infrastructure and resources for our university to become an international leader in translational microbiome studies. Our primary objective is to integrate and synergize microbiome research activities across academic and clinical institutes, the outcomes of which will provide evidence-based knowledge for the benefit of medicine and public health.

5. Total number of Unit members:

The structure of our Centre has remained the same since our last reporting period. The Centre administrates and is served by the MI4 Microbial Genomics Research Platform and the MI4 Gnotobiotic Animal Research Platform. These research platforms provide streamlined access to expertise and state-of-the-art infrastructure to understand the relationship between micro-organisms and their hosts.

Based at the Genome Centre and the Lyman-Duff building, The MI4 Microbial Genomics Platform brings together and strengthens expertise in microbiology, culturomics, genomics and bioinformatics to assess microbial content and identify key microbes associated with health and disease.

Based at the Research Institute of the MUHC, Glen site, The MI4 Gnotobiotic Animal Research Platform provides live animal testing to directly elucidate the effects of specific microbiome types and how microbial communities can be modified and optimized for improved health.

Given this unique structure, investigators can engage the Centre as users and members:

1. A User is defined as a Principal investigator who renders platform services on a fee-for-use basis and/or uses Centre protocols or other documentation for funding applications. Currently, we have 18 users spanning more than 10 departments.

2. A Member is defined as a Principal investigator at McGill University with a published and/or self-identified interest in microbiome research. To become a member, investigators will be invited to submit their CV and a 500 word statement of intent, describing how they can contribute to the goals of the Centre including, but not limited to, governance, attendance at annual meetings, engagement in community outreach and Centre advancement. Applications will be reviewed by Centre leaders (King, Maurice, Dewar, Cousineau, Shapiro) and one external investigator (TBD). Since receiving provisional status in December 2020, we have 9 members that contribute to Centre governance.

6. Number of members affiliated with McGill's FMHS:

1. Dr. Irah King, Dept of Microbiology and Immunology
2. Dr. Corinne Maurice, Dept of Microbiology and Immunology
3. Dr. Ken Dewar, Dept of Human Genetics
4. Dr. Benoit Cousineau, Dept of Microbiology and Immunology
5. Dr. Jesse Shapiro, Dept of Microbiology and Immunology
6. Dr. Bastien Castagner, Dept of Pharmacology and Therapeutics

7. Unit's website:

The website launching has been an important achievement for the Centre, which started with a logo contest within the McGill community last Fall. After building content and structure with the support of McGill IT and Communications, the website is live since March 21st. The Centre website displays the interconnectivity of both platforms, but also shows their own specificities, services and collaborators. It will be continuously improved to optimize our visibility and will also promote news, events and partner groups such as the McGill Centre for Antimicrobial Resistance. Although it will serve as a primary mean of contact, where we centralize information to facilitate the accessibility of our units to our customers and potential stakeholders, our website also details:

- The Centre leadership group, teams and collaborator centres;
- Mission and vision;
- Services offer for the Centre's units;
- Membership definition and requirements;
- Research publications and outreach;
- Annual reports;
- Funding organizations.

Website address (URL): <https://www.mcgill.ca/microbiome-research-centre/>

Please respect the page limits, where indicated.

(minimum font size of 11 pts, use lay language)

1. Explain the significance of the Unit's mission at McGill and beyond (1/2 page max.)

Our purpose comes from an increasing need within McGill and the broader scientific community to support life scientists as they consider the microbiome as a biological variable with impacts on health outcomes. Our Centre collaborates with these researchers to share knowledge, expand research programs and provide technical expertise to aid in the design, execution and analysis of studies involving the intersection of living organisms and the microorganisms that they host. With these abilities, we offer a turnkey resource to access complementary services in a single location, reduce intermediaries and facilitate achievement. Our collaborative value extends beyond McGill as we aim to become a reference Centre for local institutions as well as the pharmaceutical sector. As such, our Centre seeks to provide sustainable partnerships for the benefit of our stakeholders and communities that we serve.

The Centre has made significant progress in the last year by reaching major milestones explicitly described within our MI4 annual report. These achievements demonstrate our Centre's role within the research community (see **Appendix 1**).

2. Alignment with the [Faculty's Strategic Research Plan](#) (1/2 page max.)

The McGill Centre for Microbiome Research intersects the four major health and disease areas identified by the Strategic Plan and its four cross-cutting strategic priorities. Within these priorities, our Centre supports the study of host-microbe interactions in health, infection, inflammation, development and cancer. More precisely, the Centre aims to:

1. Reveal the role of the microbiome in mechanisms underlying the development of infectious and inflammatory, auto-immune and neurological diseases to inform new treatment approaches.
2. Advance translational studies by incorporating microbiome data into multimodal research to answer complex biological and/or clinically relevant questions.
3. Identify how microbiome diversity within and between patient populations are associated with health outcomes ranging from vaccination and infection to cancer and neurodegenerative disease.

The recruitment of our new members opens new doors allowing us to enhance the interactions of these different specialties even further in order to face a constantly changing world and an increased role for science within complex societies.

3. Major joint publications over the past 12 months (including shared software, data repositories; with links) co-authored by at least two PI members of the Unit:

1. Singh A, Li Y, Mirzaei MK, Shamash M, **Samadfan R, King IL, Maurice CF**. *Transplantation of bacteriophages from ulcerative colitis patients shifts the gut bacteriome and exacerbates DSS-colitis severity*. Microbiome (in press)

2. Tager M, **Shapiro BJ, Maurice CF**. Translational activity is uncoupled from nucleic acid content in bacterial cells of the human gut microbiota. Gut Microbes. 2021 Jan-Dec; 13(1):1-15. doi: 10.1080/19490976.2021.1903289.PMID: 33779505

Our internal strain repository currently contains over 1350 isolates from over 135 species from collaborators and clients. In the upcoming year, we will publicize this on our website and evaluate levels of interest from the research community.

4. Major joint research projects funded over the past 12 months (involving at least two PI members of the Unit:

Kenneth Rainin Foundation

Synergy Award, 2022-2023, **Dr. Irah King and Dr. Corinne Maurice**: « *Interrogating immune-bacteriophage dynamics to mitigate intestinal inflammation* »

Fall Project Grant Scheme / CIHR / Pharmaceutical Sciences committee

2020-2024, Dr. **Bastien Castagner** (lead PI), **Dr. Corinne Maurice** (co-PI), Dr Bertrand Routy (co-PI), David Juncker (collaborator): « *Microbiota-accessible carbohydrates as precision prebiotics in cancer immunotherapy* »

The Centre has been an active contributor and supporting resource for many research teams, clients and collaborators. Although this contribution does not precisely apply to this annual report framework, it nevertheless underlines the positive impact of our Centre (see **Appendix 2**).

5. Major outreach activities (e.g., seminar series, general public events):

1. Health Matters Podcast with Tara Schwartz in cooperation with the McGill University Health Centre (March 30, 2022), **Dr. Irah King** interview: « *Gut Health and the McGill Centre for Microbiome Research* »

Due to the activity delays incurred at the beginning of last year's reporting period, partially caused by the pandemic restrictions, we did not reach the expected level of growth to be able to host a significant and structured event for the benefit of the research community. However, we have been able to make up for lost time in the last 6 months and we have initiated planning a two-day Symposium that will take place on December 1-2, 2022. We have already invited our four external

advisory board members and a broader announcement will be publicized on our website and also sent to the McGill community by email.

6. Major training activities (e.g., summer schools, co-supervision of trainees, practical workshops):

The Centre has led several training activities focused on the operation of platform equipment and infrastructure to streamline research projects and carry out client services. Specifically, the Maurice Lab organizes training sessions for graduate students and research staff to use anaerobic chambers for culturing commensal bacteria isolated from the human and mouse gut microbiota. The Maurice Lab also holds training sessions for DNA isolation from human stool samples in preparation for microbiome rRNA sequencing.

The King lab (led by the Centre Program Manager, Cynthia Faubert) holds training sessions graduate students and technical staff for handling and manipulation of mice under germ-free conditions. As we expand research platform infrastructure, we anticipate an increase in these training sessions as well as newly developed training sessions that meet the needs of our platform users and McGill Centre members.

7. If applicable, list new members who joined the Unit in the past 12 months (indicate: Name, title, full/associate member, affiliation):

We see the members of our Center as partners in success as well as collaborators with a common goal. As mentioned in point 5 of the report, the members of our Centre must individually commit to its advancement with the collective aim of being actors in scientific innovation. Consequently, we are looking for quality members rather than numerous members who, through their expertise and their field of research, will contribute to the complementarity of our services and the sustainability of the Centre. Consistent with these values, we have welcomed three new members whose profiles align with Centre objectives:

1. Dr Rana Samadfam, PhD, DABT, MSc

Scientific Director, In Vivo Pharmacology
Charles River Laboratory

2. Dr Jianguo Xia, BMed, MSc, PhD

Canada Research Chair (Tier 2) Bioinformatics and Big Data Analytics
Assistant Professor – Large Data Analysis
Faculty of Agriculture and Environmental Sciences, Department of Parasitology

3. Dr Jennifer Ronholm, BSc, PhD

Assistant Professor
Faculty of Agriculture and Environmental Sciences, Department of Food Science and Agricultural Chemistry

8. If applicable, list members who have left the Unit in the past 12 months (indicate: Name, title, full/associate member, affiliation):

None.

Financial report & forecast

McGill Centre for Microbiome Research

Expenses	2021/22 report	2022/23 budget
Total salaries		
Training		
Stipends		
Outreach	0	10 000
Publications		
Other (detail in #9 below)		30 000
Total expenses	0	40 000

Revenues	2021/22 report	2022/23 budget
Carryover		35 000*
FMHS	15 000*	15 000
User fees		
Other sources (detail in #9 below)		
Total revenues	15 000	50 000

A- MI4-Gnotobiotic Animal Research Platform

Expenses	2021/22 report	2022/23 budget
Total salaries	39 000	41 003
Training		
Stipends		
Outreach		
Publications		
Other (detail in #9 below)	91 353	104 506
Total expenses	130 354\$	145 509\$

Revenues	2021/22 report	2022/23 budget
Carryover	19 351	
FMHS		
User fees		
Other sources (detail in #9 below)		145 509
Total revenues	19 351\$	145 509\$

B- MI4-Microbial Genomics Platform

Expenses	2021/22 report	2022/23 budget
Total salaries	154 560	171 854
Training		
Stipends		
Outreach		
Publications		
Other (detail in #9 below)	22 007	31 900
Total expenses	176 567\$	203 754\$

Revenues	2021/22 report	2022/23 budget
Carryover	21 982	
FMHS		
User fees		
Other sources (detail in #9 below)		203 754
Total revenues	21 982\$	203 754\$

9. Budget justification and details (e.g., itemize if multiple salaries, detail other sources of funding):

McGill Centre for Microbiome Research

Expenses-2022/2023 budget

Other expenses:

1. Anaerobic chamber = 20 000\$. The Centre has submit a request (still pending for approval) to MI4 to use funds for the purchase of this specialized equipment.
2. Benchmark and pilot projects = 10 000\$. Optimization of our activities and protocols to improve our services.

Revenues- 2022/2023

1. Carryover = 35 000\$*. Actual Centre's balance in our account which contains the FMHS contribution of 15 000\$* (2021-2022).

Due to the pandemic regulations carried on last year, we were not able to host our Symposium as planned for 2021 and expenses allocated for that outreach activity (**Expenses 2021/2022**), to be taken from the FMHS contribution of 15 000\$ (**Revenues 2021/2022**) have been postponed. Our Symposium will take place on December 1st-2nd 2022 and expenses for this event appear in the Expenses chart, **Budget-Outreach 2022/2023**.

MI4-Gnotobiotic Animal Research Platform:

Other expenses:

1. Goods, Materials and Supplies = 53 685\$
2. Other Direct Costs
 - a. animal costs = 37 668\$

Revenues:

1. Other sources: MI4 = 145 509\$

MI4-Microbial Genomics Platform:

Total salary:

1. Managerial = 32 850\$
2. Culturing lab technician = 43 820,34\$
3. Contract services (McGill Genome Centre and C3G support) = 77 889,66\$

Other expenses:

1. Goods, Materials and Supplies = 22 007\$

Revenues:

1. Other sources: MI4 = 203 754\$

10. Explain why continued support from the FMHS is crucial to Unit (½ page max):

In addition to the administrative and financial essential support provided by the Faculty, the affiliation of our Centre to this entity allows us to be an active member of the McGill scientific community through the exchange of knowledge and collaboration facilitated by the structure of the Faculty and its interconnection with other Faculties. This accessibility to knowledge and networks allows our Centre to constantly evolve and adapt our strategies and objectives to meet emerging needs that we may not be able to predict without this privileged access. Finally, our Centre benefits from its association to the Faculty's name, giving it credibility, visibility and a sense of belonging in the face of shared objectives.

11. Provide suggestions about how the Faculty could do better to support the Unit and research efforts in general (no page limit but please be specific and unleash your creativity!)

- Have access to a multidisciplinary team of specialists in the administrative field, in particular for the production of a business plan, growth strategy for achieving financial autonomy, advertising campaign for outreach. Experts intrinsically linked and dedicated to the initiative would foster the success of our Centre, be an asset for the optimization of resources and ensure the continuity of its existence.
- Physical space to consolidate the anaerobic culturing capacity of the Centre (suggestion mentioned in last year report, but still pending).