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General

Introduction

Welcome to the lab! This manual is intended to help guide you through your time in the Barrett lab. Please take the time to look through it for answers to any questions you might have, and for general information about the lab and McGill. You can find lots (and lots!) more information within the lab Google Drive, but hopefully this manual provides a handy resource to locate what you are looking for. If in doubt about anything, please don’t hesitate to ask another lab member. We are all here to help each other. Please note that this manual is very much a work in progress, and you can help by editing and adding useful information. In particular, please link to relevant folders and documents on the lab Google Drive. Where text is written in the first person, it refers to me (Rowan), but I welcome (and need!) input from everyone on this document. I have adopted/adapted some of this information from ‘lab values’ and ‘lab protocols’ documents created by other research groups that share beliefs/practices/protocols with us. Many thanks to Marc-Olivier Beausoleil for providing the inspiration to put this manual together, and the template on which it is written.

Land acknowledgment statement

McGill University is located on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. We honour, recognize, and respect these nations as the traditional stewards of the lands and waters on which we meet and work.

Mission statement

Our purpose is to discover new and interesting things in biology, and to create a collaborative, productive, and friendly environment in which we can train future generations of scientists.

Equity, diversity & inclusion

We strive to foster and promote equity, diversity, and inclusion without group, and more broadly within the scientific community we are a part of. Unlike the notion of equality, equity is not about sameness of treatment. Equity denotes fairness and justice in process and in results. Equitable outcomes often require differential treatment and resource redistribution so as to achieve a level playing field among all individuals and communities. Diversity describes the presence of difference within any collection of people. In discussions of social equity, diversity addresses differences in social group membership related, for example, to race, Indigenous identity, class, gender identity or expression, sexuality, ability, ethnicity, and religion. Inclusion refers to the notion of belonging, feeling welcome, having a sense of citizenship, and the capacity to engage and succeed in a given institution, program, or setting.

Presentations by Victoria & MK

If you have suggestions or concerns regarding equity, diversity and inclusion in our department, please forward them to GARM (Graduate Association of the Redpath Museum) by submitting this anonymous form.
**Reading suggestions**

*Decolonising methodologies* by Linda Tuhiwai Smith  
*Braiding sweetgrass* by Robin Wall Kimmerer

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**Commitments from me**

- Your time and effort are valuable and appreciated. I am committed to doing my utmost to help you in your work, take your best interests to heart, and guide your efforts in ways that benefit you first and foremost.

- I aim for members of the lab to become accomplished independent researchers during their time here. This includes learning about relevant methods, acquiring scientific independence in projects, mastering the literature in your field, and working on the project of your choice. It also includes learning about other aspects of doing science, such as scientific writing, grant writing, giving scientific presentations, and networking.

- I strive to have a diverse lab. We need multiple voices and perspectives in science, and a safe place to conduct our research. We welcome lab members regardless of race, religion, gender identification, sexual orientation, age, or disability status. As long as you are excited to do good science and respectful to others, you are welcome here. Beyond fostering an *equitable, diverse, and inclusive* space for my trainees, I aim to be *anti-racist* and work to correct the systemic injustices in academia.

- I will provide financial support for your *stipend* and research to the extent that I am able to from my grants. I will be open and honest about the financial resources available for your work. I also try to provide financial support for each graduate student to attend one scientific meeting each year (although it is helpful if you can obtain your own funding through *travel awards*, etc.).

- I will meet with you frequently (typically once per week, either in person or remotely) to check in and discuss any topics you would like.

- As rapidly as I am able to, I will provide feedback on your manuscripts, applications, and presentations. I will also write recommendation letters for you.

- I will support you in your career goals, whatever they may be. I will help you network with other scientists for collaboration and career advancement.

- Your health and wellbeing are important to me. I will do what I can to help you accomplish your scientific and career goals in a way that keeps you happy and healthy. I will strive to resolve interpersonal conflicts and to maintain a harmonious and safe working environment for all lab members.

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**Expectations of you**

In addition to my commitments to all lab members (above), I have expectations of the people that I admit to my lab. If you do not feel that you can meet these expectations, this lab is probably not a good fit for you. To make sure that you and I are on the same page, I will also work with each lab member to develop an individual mentoring plan.
Ethics and collegiality

- Members of the lab are expected to take full responsibility for their research, and to carry out their work honestly, openly, carefully, and with interest.

- Be kind to others. Behave professionally. It is important to realize that the lab is a professional setting, even though we are often very informal with each other. Harassment and sexist, racist, or exclusionary language and imagery are not appropriate at any time. Be careful not to commit microaggressions. Be aware that your actions can be hurtful to others or contribute to a negative environment even if you had no intent of harm. Report incidents to me if they occur, and if necessary to the appropriate offices at McGill.

- Be kind to yourself. Be mindful of your limits. Please discuss any challenges you are facing with me and make use of the wellness resources and support available at McGill.

- Please make an effort to foster an inclusive environment for everyone. Give people a chance to talk and an opportunity to contribute. The functioning and success of our lab depends on a common sense of purpose and cooperation. Although I value and seek out independence in lab members, it is important to realize that we all depend on each other, and must act in a thoughtful manner towards each other. You are expected to be invested in the current and future success of other lab members. Please be an active listener and take the concerns of others seriously.

- Noise levels in the office. Be aware that people have to work together in limited physical space. Respect that others might need to concentrate: try to schedule online and in-person meetings outside of the office space, or find time slots when the office is less crowded and ask your co-workers whether they might be disturbed. At all times keep your voice low if the entire office is not involved in the conversation.

- Please do not come to the lab if you are sick. Take the time you need to recover, and avoid spreading illness to others.

- Take due diligence when leaving the lab.

Productivity

- Lab members are expected to be self-motivated. My work schedule is not yours. You are here to advance your career, not mine. We strive for a supportive and encouraging environment to practice science, and to provide the resources needed for successful research, but how, when, and how much you work is up to you. All lab members are encouraged to attend lab meetings and to participate in lab activities, but the way you conduct your own research is your choice. This holds for everyone from postdocs to undergraduates. One of the great benefits of being a scientist is that for the most part we are free to decide our own schedules. All lab members are encouraged to work in whatever way they personally find most effective. This may include working outside regular hours or remotely. Whatever your choices, be aware of their costs and benefits.

- Identify your personal definitions of success. Discuss your goals with me and if you are comfortable with it, your peers. Re-evaluate frequently. You can develop an Individual Development Path through the use of myPath and the associated resources.

- A core component of being a practicing scientist is to publish your work in a timely manner. This is important to disseminate our findings to the scientific community and contribute to general
knowledge. It also advances your career and that of your collaborators. And we owe it to the tax-paying public that funds our research to provide some concrete output from their investment in our work.

- Above all, I value results over process. I don’t care how you get your work done - please work in whatever way allows you to be happy while producing the best science possible!

**Good scientific practice**

- Make all attempts to practice science in an ecologically responsible manner. Conserve, reduce, reuse, recycle.

- I expect my lab members to attend seminars to learn what other researchers are doing and participate in their academic community. I also expect you to read science papers or books most days. If you don’t want to read extensively and intensively, examine whether you are doing the kind of science that truly engages you.

- **Backup your data!**

- Write up Standard Operating Protocols (SOPs) for any commonly-used method so people who follow after you can replicate your methods exactly. Use the lab GDrive and GitHub account or similar resources to share data, code, and text.

- Learn to keep a budget of your research costs and make sure I am aware of your anticipated expenses in advance of when you need them. This is essential for the management of our lab funds.

- In certain (but not all) respects, a lab works like a small business. We have overhead funding, revenue (grants), a payroll, and a product (our research). Reagents, etc. cost money, but so does your time. We don’t always want to save money at the expense of efficiency and time, but keep in mind when purchasing things that it has taken hard work to obtain those funds (hours and hours of grant writing), and money is always finite - if funds are used for one thing they can’t be used for something else (like student stipend support!).

- Accidents happen. Things fall, get broken, and get left on. But there are often steps that can be taken to avoid accidents. Set aside sufficient time for the experiment. Don’t rush. Make sure you are focused and not sleep deprived, give some extra thought to what you are doing and why, and be deliberate about all of your actions. Working this way keeps equipment from being broken and keeps everyone safe.

- If you don’t understand something or want more information, ask. Becoming comfortable asking questions in meetings and at seminars and conferences is a valuable skill. It is an effective way to learn, and it helps to establish collaborations, develop ideas, and connect you with your peers. A good practice is to try to come up with at least one question you could ask at every talk or discussion group you attend. Asking the question is only part of the exercise. Simply preparing for it will force you to pay closer attention and think critically about what is being presented. And if there is one of those awkward moments where nobody asks a question at the end of a talk, you can save the day!

**Authorship**
Discuss authorship expectations before embarking on a project.

- You earn first authorship if you do most of the data collection, analysis, and writing.

- You earn co-first-authorship if you and someone else either did equal amounts of work or each contributed most of different stages (collection, analysis, writing).

- You earn co-authorship if you contribute an essential effort to obtaining the data or writing the paper. There should be some distinct result or intellectual idea that you were the primary source for.

- You must have read, understood, and approved any paper you are co-author on and be able to defend it.

Leave of absence and vacation policies

Life happens. Leave of absence may be needed for a variety of reasons (parental leave, mental health, compassionate grounds, etc.). Putting your graduate studies (or postdoctoral work) on “pause” is completely fine with me. Of course, the earlier we can plan for it the better so that there is minimal disruption to your research. Although I have no problems with personnel taking a leave of absence, it is important to check the official ramifications in terms of your funding, degree timelines and requirements, etc. Please check the policies on this from McGill and any funding sources you rely on (e.g., NSERC and FQRNT).

Officially, graduate students and postdocs are entitled to vacation leave equivalent to university holidays and an additional total of 15 working days in the year. However, in accordance with my expectations about lab members being self-motivated (see “expectations of you” section), I don’t care if you take more (or less) than this if you want to. How much vacation you want to take is completely up to you. You don’t need to ask me permission for it either (although please let me know if you will be away for an extended period). Whatever you find works best for allowing you to be healthy, happy, and productive is good with me. However, note that “technically”, students and postdocs with fellowships and research grant stipends taking additional vacation leave could have their funding reduced accordingly by funding agencies.

Supervisory committee

The supervisory committee consists of the supervisor (Rowan) plus two or more other members. If you have a co-supervisor, only one other member is needed (but it is usually good to have two additional members in this case). Please see this page for instructions and the nomination form for setting up your supervisory committee. Note the timelines by which you need to have your first committee meeting.

After discussing potential SC member(s) with your supervisor, email the potential SC member(s). Be sure to include a brief overview of your project, your interests/background (e.g. include CV and transcript), identify the current SC members, and explain why you think this individual would be a good fit for your committee. Once all potential members agree to sit on your SC, complete the SC nomination form and send it to Ancil Gittens.

Schedule a two hour time block for the initial meeting and prepare the following beforehand:

- SC Report with progress/plans sections filled out.
- Complete page 1 of the Progress Tracking Form.
- Send both documents to all SC members a minimum of one week before the meeting.
- A Presentation based on your SC Report.
- Print the Graduate Student Research Progress Tracking Report.

Discussions to expect at the initial meeting:
- Your academic background (bring CV/transcript).
- Suggested courses that would fulfill your program requirements.
- Your thesis/research proposal.
- Questions relating to your project (e.g. validity of approach/technical issues/ significance of your research/future directions etc).
- An evaluation of your progress (this discussion will not include you).

Post-meeting
- After you and your committee members are done discussing your project, you leave the room and they privately discuss your project. During this time, they will determine if your progress is satisfactory/unsatisfactory.
- Your SC must then complete and sign the Progress Tracking Report.
- You send the completed Progress Tracking Report and the SC Report to Ancil.

Graduate student funding

The Biology Department specifies a minimum level of support for all graduate students (at the time of writing, $16,222 plus tuition and fees). For students with fellowships that cover this amount or more, the funding situation is straightforward. For those without a fellowship, things are slightly more complicated. Students are guaranteed a ‘stipend’ of $10,600, which must be supplied by funds from my research grants. The remaining $5,300 is expected to come from teaching assistantships. Students are expected to be offered a minimum of 180 hours of TAships per year, which will typically accomplish this amount, and can TA more if they wish to make more money. However, these TAships are ‘subject to availability’. If a student is not provided with sufficient TAships to attain the $16,222 minimum level of support I will try to provide additional support through my research grants to get them to this level. I will also do my best to “top up” funding levels for students when my grants allow it. I know how difficult it is to live on a graduate student salary (I was very poor during my own PhD in Vancouver…) and want to help as much as I can. But, it is always a difficult balance because money going towards stipends cannot be used to fund our research.

To keep track of your funding and help me plan expenses, please fill out this form.

Please consult this page for more information about financial support and fees for Biology students at McGill. Read carefully!

Teaching assistantships

Graduate students can be partially supported by being appointed as teaching assistants for one or more undergraduate courses. The salary received as a teaching assistant is subject to income taxes and other applicable employment deductions (Employment Insurance, Quebec Pension Plan, etc.). Regardless of your funding situation, I recommend that all students TA at some point during your graduate training.
This page shows current TAships available. You can see examples of courses that lab members have TAed here, along with their thoughts on the course.

**Awards and grants**

I do my best to make sure we have sufficient funding for everyone to do world class research. I want you to focus on doing the best science possible and not have to worry about money. However, you can certainly help our collective efforts by applying for funding as well. Funds you obtain can provide you with more independence to attend conferences, do fieldwork, and fund risky or expensive projects. And it also provides invaluable experience in grant-writing, which is a large component of being a practicing scientist. I am always happy to work with you to write grants and apply for fellowships.

You can find a number of funding opportunities here. Examples of applications from lab members that could be used as templates for future applications can be found here.

**Intellectual property & patents**

If you think your research could have commercial potential, it is probably a good idea for us to meet with a technology transfer manager (we have worked with Jarred Chicoine in the past) and discuss submitting an **invention disclosure form**. This will provide avenues for us to protect the intellectual property being developed. You may also be involved in research in the lab that is funded via partnerships or agreements (as opposed to grants) between McGill and an industry, government, or non-profit organization. It is useful to determine the **appropriate type of arrangement**, which can differ in terms of the parties’ control over scope and timing of the project, the nature of the services provided, intellectual property rights conferred to the sponsor, the type of research personnel involved, and the degree of latitude on budgeting.

**Undergraduate mentorship**

All undergraduates will conduct their projects with a more senior lab member (graduate student, postdoc, or lab manager) as a mentor in addition to receiving supervision from me. This mentor should have relevant expertise in the project and be interested and invested in the research. Nobody will be ‘forced’ to mentor a project; if no mentor is available, it is likely we will not accept the student into the lab. This mentorship serves two important functions: 1. It provides valuable training and mentorship experience for lab members. Effective mentorship is an extremely difficult skill, and despite its importance for many likely career paths for those in grad school, it is not one that can be easily taught through courses. Direct supervision of an undergraduate project is a very effective way to learn what does and does not work and hone your mentorship ‘style’. 2. It ensures that undergraduates have someone who can teach them basic lab methods relevant for their work, and respond to questions or problems they might have. The undergraduate and their mentor should schedule regular meetings to discuss their project. Meetings with me can also be scheduled to discuss ideas and troubleshoot problems that may arise.

- Why involving undergraduates in research is important by Emery et al. 2019.
- Peer mentorship is also critical to increasing diversity in STEM, see Thomas et al. 2015, Kendricks et al. 2013
When an undergraduate joins the lab, please add their name and details to the lab’s list of undergraduates. Remember to update this list when an undergraduate leaves the lab! Please also ask them to complete this checklist before they leave the lab (check this section for more information).

Undergraduate recruitment

There are many ways to recruit undergraduates for the lab. We frequently have undergraduates contacting the lab directly asking for volunteering or internship opportunities. These emails are currently forwarded to Åsa, so please contact her if you are looking for help with a research task. Other options include:

- The Student Research Initiative (SRI) has a database for research positions to help undergraduates find volunteering and paid opportunities in research. 
- The SRI also organises an annual Faculty Student Speed Networking event in the spring where someone from the lab (either a student, technician or PI) can talk about available opportunities to potential undergraduates. 
- McGill Biology Student Union also has an Employment Committee which aims to provide students with a list of available positions for undergraduate students in our department (contact: mbsuvpacademic@gmail.com). 
- You can also advertise the position in a relevant lecture (e.g. a course you are TAing) 
- myFuture is the official site for advertising McGill job postings and internships across subject areas.

When recruiting undergraduates, please try to advertise the positions publicly to increase the likelihood of recruiting people from a variety of backgrounds.

Compensation

Undergraduates are a valuable part of research. There are many ways in which undergraduates can be rewarded for their efforts and commitment and you should always look into the various options before taking on an undergraduate.

Possible options for McGill undergraduates:
- Work-study
- Independent Research Project
- Credit?

Options for non-McGill undergraduates:
- Hiring the student as a research assistant

Authorship?

Undergraduate training

All undergraduates should be carefully trained before they conduct research tasks independently. The primary person responsible for the training of the undergraduate is the mentor.
In general, students should first observe someone experienced conduct a task. After that, the trainee should conduct the task by themselves with the mentor supervising the process and providing feedback. Finally, the trainee should conduct the task independently while the mentor is present in the lab to answer questions.

Always give your contact details to the student in case they need guidance or encounter problems!

Undergraduates who will be using the molecular lab must complete the Laboratory Safety Orientation Checklist and return it to the lab manager/technician after an in-person introduction to the general safety practices and rules in the lab.

Undergraduates must also complete all necessary training prior to commencing work in the molecular lab. Any undergraduate working in the molecular lab needs to successfully complete WHMIS 2015, Hazardous Waste Management and Introduction to Biosafety before starting.

Training certificates must be uploaded to the Google Drive by creating a personal folder for the student in the Undergraduate e-certificates folder. Certificates are typically emailed about four weeks after completing the training. Since the undergraduates do not have editing rights to this part of Google Drive, the mentor is responsible for making sure all the relevant certificates are uploaded.

Please ask the undergraduate to complete the NSERC consent form that gives us permission to list the student’s name on grant applications. This is optional, so the student does not need to sign it if they wish to remain anonymous. Please upload the completed form to this folder and rename the document with the student’s full name.

**Grading undergraduate research**

Graduate student mentors will provide the first pass at grading independent research projects. Please use a clear rubric. Rowan will then read the report and discuss the evaluation with the graduate student to agree on a grade.

**Undergraduates leaving the lab**

Before an undergraduate leaves the lab, please ask them to read the document on things to do before leaving the lab. Remember to move the undergraduate’s training certificate folder here. If you uploaded the undergraduate’s CV to Google Drive at some point, please move the CV here.

Please make sure to complete all columns in the undergraduate spreadsheet. The contact details are especially important, in case we have questions about the samples they worked on.

**Undergraduate trainees during Covid-19**

Please see the New Trainee Request Form for getting undergraduates approved for doing research during Covid-19.
Lab management

Lab jobs

Keeping a lab running smoothly is a collective effort. Nobody can do their research on their own. The primary responsibility for managing the lab rests with me, but I need help from everyone to create a productive, efficient, cost-effective, environmentally-responsible, safe, and happy working environment. I will work closely with any salaried research associates to manage the collective resources and requirements of the lab, but to keep everything running smoothly we also have a system of ‘lab jobs’ for all personnel other than undergrads. There is a primary person associated with each job (the ‘sheriff’), as well as two back-ups (‘deputies’). The idea is that the sheriff will be in charge of figuring out the primary tasks that need to be done within each job, and generally making sure they get done. For most jobs the sheriff will be a research associate (currently, Åsa Lind), and the deputies will be graduate students. The sheriff can either do these tasks themself, or contact the deputies as their first point of contact when they need help with things. But, the deputies are not expected to be responsible for organizing these tasks. I want my students to be able to focus on their research. While I want everyone to contribute to common lab tasks, and this is essential for our group to be able to work smoothly, I don’t want them to have to spend any more time on them than is necessary. The deputies will hopefully accumulate knowledge and expertise related to their lab jobs and be effective at helping the sheriff do their job (because they can’t do everything themselves), but they are not primarily responsible for these jobs.

All graduate students and postdocs will initially be listed as a being a deputy on two different lab jobs. This is an attempt to spread out the workload evenly, but of course some jobs take more work than others. An effort will be made to have people do jobs that are closest to their expertise or activities that they are heavily involved in. We can continually reevaluate the jobs and shuffle people around as needed. However, we want to avoid too much job switching or people will not accumulate enough knowledge to do their jobs effectively. For instance, people can keep their jobs if they are going to be away for a few months (for fieldwork, etc). The idea behind having two deputies is to build some redundancy into the system when people are unavailable. But of course, if it doesn’t make sense for someone to continue in a particular role then we can make a switch (e.g., if someone is done with lab work and won’t be in the molecular lab again it wouldn’t make sense for them to have a Molecular Lab job).

Assistance with research tasks

If you need assistance with a particular research task, please discuss it with me and list it on this page. The research associate will check this page frequently and come up with a plan (in conjunction with you and me) to help you with the task.

Expense reports

Remember to read the expense report checklist before you travel. The most up-to-date instructions on how to submit an expense report can be found on McGill’s website. Please also check our lab protocol for submitting expense reports here.

Always save the reference number of the expense report before submitting! You may need it for printing or viewing the file once submitted (see below). When printing the expense report, make sure the reference number and total cost is marked in the header and footer of each page. Instructions on how to do this can be found here.
**P-Card**

One-time suppliers, and suppliers that are used less than once a year, should be paid with a P-Card. Only Rowan can actually make the purchase with this card.

**Viewing & printing submitted expense reports**

Sometimes when you submit an expense report, the system doesn’t give you the option to print at the end. If this happens, go to the ‘View Advance Request and Expense Report History’ and search for the relevant expense report by using the reference number.

**Covid-19 related expenses**: In the FAOPAL section, enter COVID as the activity code instead of 000000 for the items that are Covid-19 related.

**Paying participants**

Description on how to pay participants taking part in your study.

**Infrastructural resources**

**Lab space**

Our molecular lab is located in N6/15 (Room 15 of the 6th floor of the North Wing) of the Stewart Biology Building. This lab includes a dedicated eDNA room. We also have lab space on the 4th floor of the South Block of Stewart Biology (currently under renovation, room numbers TBD), and research space in the Phytotron. You will require keycard access to Stewart Biology and all lab spaces. Please contact Carol Verdone-Smith to obtain this access. Please see here for information about our lab policies and protocols.

**Office space**

Our office spaces are in the Redpath Museum. You can obtain access to the Museum through the public entrance at the front of the building during opening hours (9am-5pm). Outside these hours you must use the side entrance on the Westside of the building (next to Leacock), and have keycard access to unlock the door. Interior doors in the museum mainly require physical keys. Please contact Caroline LeBlond or Ginette Dessureault to obtain these. My office is 303A in the Redpath Museum. All graduate students, postdocs, and research associates have office space in 207 Redpath. When desks become vacant because someone leaves the lab, the most senior member of the lab will have the option of moving to the newly open desk. If they do not want to move to that desk, the next most senior person has the option, and so on. The exception is the large desk in the Northwest corner of the office, which is generally reserved for research associates or postdocs.

The office phone number is 514-398-4086 x0071—. Rowan’s office phone number is 514-398-4086 x00856.
Museum access during COVID-19

Instructions for requesting museum access during COVID-19. Ensure that you come to the Museum only at the approved date and time. Security will be closely monitoring who has been given access and the duration of their visit on the premises. Anyone at the museum who is not scheduled to be in will have their access revoked.

1. Fill out the following form to request one-time access. There should be at least 30 minutes between each visit for one time visits.
   https://forms.office.com/Pages/ResponsePage.aspx?id=cZYxzedSaEqyqfz4-J8J6vZMNDEbxrBFhue3fwBM2khUN0dMOFIBWEhXV0VZV0ZPVINKSTA1N0JaTi4u

2. If you require regular access please contact Ginette or Hans and fill in this form.

3. View the calendar for available slots
   https://calendar.google.com/calendar?cid=Y3QzY28zOW9gb3J3dGRxMXY4cDhnZzR0YTRAZ3JvdxAuY2FsZW5kYXJuZ29vZ2xLmNvbQ

3. Wait for a response from Nicole to confirm that your date and time has been approved. She will coordinate card access with Ginette.

4. Email Nicole when you arrive and when you leave, each time you come to the museum.

5. Watch the training videos (links below) before coming to campus:
   - Preventing Transmission: https://youtu.be/O6ijoHofYlA
   - Physical Distancing: https://youtu.be/OAjporIeOCU
   - Environmental Cleaning: https://youtu.be/EYCVYcGbCGc
   - How To Use a Face Covering or Mask: https://youtu.be/gu-sqT1us_U

6. Follow the directives:

7. Fill out the COVID-19 Daily Health Check Self-Assessment Form found in the Personal Tab in Minerva, before coming to campus on the day of your visit. This assessment must be completed each time you come to campus. If you answer yes to any of the questions, cancel your visit and let Nicole know.

8. Wear a mask at all times while in the Museum. Use the employee door to enter the building, back stairs to go up, main stairs to go down and exit at the front door. Disinfect your hands as you enter (sanitizer distributor entrance and exit) and before you exit.

9. If you run into issues while on site, please contact either security, your PI or Ginette (514-730-5942) depending on the issue. If safety is a concern, contact security immediately 514-398-3000, or 911.

9. If you plan to take non-personal items out of the Museum (e.g. computers or other research equipment) fill out the following form:
   https://forms.office.com/Pages/ResponsePage.aspx?id=cZYxzedSaEqyqfz4-J8J6qJX4D_aQJDqrMFsPOUKTVUNEIwMzVNOEEExSEs3TTVYVEVTNzIVOThKNI4u
10. All completed forms need to be sent to Nicole Robinson Paul who will send Hans and Ginette a copy.

Lab meetings & communication

Lab meetings

We have two types of lab meetings: within our own research group and a joint ‘super lab’ meeting in combination with the Hendry Lab (called DRYBAR). Normally we alternate by having a joint meeting and a Barrett lab meeting every other week during the same time slot before the CEEB departmental seminar in the Redpath auditorium.

The objective of the meetings is to share news, updates and other important information. We frequently discuss recent publications and general issues in academia. The meetings are also great for practising presentation skills, so feel free to sign up to give a presentation about a topic of your choice in the lab meeting schedule!

There are a lot of resources on how to organise efficient lab meetings. This post on How to conduct an effective regular group meeting offers some suggestions.

Individual meetings

I have weekly meetings with all graduate students, postdocs, and research associates, typically on Thursdays. These are usually 30 minutes and are intended as a general check-in so I can keep up to date on what you're doing and you can get direct feedback about anything you're having issues with. If 30 minutes is not long enough you are welcome to schedule a longer meeting for some other time during the week. Also, these meetings are not obligatory. If you're busy in the lab or with other things or just don't have anything in particular you want to talk about, it is no problem to cancel. The earlier you can inform me the better so he can adjust his schedule accordingly. Otherwise, assuming I am in town and doesn't have an unavoidable scheduling conflict, this time will always be available for you. A regular meeting time will be arranged when you start in the lab, but may shift from semester to semester depending on lab member’s schedules. My meetings with undergraduate members of the lab are by appointment, but can be as frequent as needed.

Slack

We have a paid Slack account for a DryBar workspace. Please join the channels that are relevant for you. You can also invite others to the workspace (e.g., undergrads), but since I need to pay for each additional member, please check with me first.

GoogleDrive

Barrett Lab GoogleDrive. Take some time to get acquainted with this. It contains a lot of useful information and is the main place that we store collective lab information. You can share access to the Drive, but please keep in mind that it is primarily intended as an internal resource and not for people
outside our lab group, unless there is a good reason for them to have access. A general policy is that only current graduate students, postdocs, and research associates will have editing privileges, whereas all other users will have view-only access. Of course, if there is a good reason to give someone (e.g., an undergrad) editing privileges, this can be granted for the relevant documents.

When you upload or create new documents and folders in the lab Google Drive, it is **recommended to transfer the ownership to the PI**. This is to prevent documents from becoming inaccessible to the lab if someone accidentally removes a file or folder. Google Drive is great for tracking changes to documents and for retrieving older versions, but accidental changes to editing rights can only be undone by the owner.

If you frequently use only a small subset of the documents on Google Drive, you can create your own lab folder in your personal drive with shortcuts to the documents you need. Creating shortcuts allows documents to exist in multiple locations. Editing the document in one location will update everyone else’s copy of the document too.

Please **avoid creating duplicate versions** of a document. This creates confusion and makes it difficult to figure out which version is more up-to-date, especially if both versions have been edited recently. If you want to create a new version of a molecular protocol with your own modifications while also keeping the original version, please rename the duplicate clearly with a descriptive name. Also, please add a paragraph at the start of the document describing the changes to the original protocol, and highlight these sections in the new version. The paragraph should also include information such as your name, date and reason for modifications.

**Contact details**

Please make sure your contact details are up-to-date in the Barrett lab contact sheet. Please also check that the contact details of any undergraduates you are working with are included on the list.

**Barrett lab email listserv**

To get on the listserv, email LISTSERV@LISTS.MCGILL.CA with SUB BARRETTLAB in the body of the email (not the subject). I will then get a message to approve the request. Or just email me and ask to be put on. You can then send messages to all lab members using the address BARRETTLAB@LISTS.MCGILL.CA.

**Other mailing lists & listservs**

There are a lot of emailing lists and listservs in the department. Please check this spreadsheet to make sure you are on all the lists that are relevant to you.

**Email practices**

The unit of email is often three. If you write to someone to ask them a question or request help with something, and they reply, it is good to send a response to their message (typically to thank them), regardless of how brief. This is not only good manners, but simply provides a confirmation that you received their email. I am surprised by how often people request things from me, I take the time to respond and help them, and I never hear back from them again.
Student associations

Graduate Association of Redpath Museum (GARM) organises weekly coffee hours as well as other activities for grad students. You can anonymously inform the Graduate Association of the Redpath Museum (GARM) about any issues you may be experiencing as a graduate student at McGill by filling in this form.

The McGill Biology Graduate Student Association (BGSA) also organises various discussion groups and events. You can find lots of useful information on their website.

Seminars, conferences & workshops

Departmental seminars

The Biology Department hosts three different weekly seminar series: The Organismal Seminar (Conservation, Ecology, Evolution & Behaviour, CEEB), The Molecular Seminar (Molecular, Cellular, and Developmental Biology, MCDB) and the Neurobiology and Behaviour Seminar (NBB).

To get added to the CEEB mailing list, please email Anthony Zerafa (anthony.zerafa@mail.mcgill.ca).

If you would like to suggest someone as a speaker for the organismal seminar, please add their name to this spreadsheet.

Upcoming PhD thesis defenses are advertised here.

Conferences

Quebec Centre for Biodiversity Science (QCBS) Annual Symposium: https://qcbs.ca/symposium/

American Society for Microbiology (ASM) Microbe: https://www.asm.org/Events/ASM-Microbe/Home

Ecological and Evolutionary Genomics - Gordon Research Conference: https://www.qrc.org/ecological-and-evolutionary-genomics-conference/2021/?fbclid=IwAR15_nbPx1zyKjS1P_cBPSmlCZ7vVswdOEZCEs02BUtOG5ZGl1qbrwaOLw

Workshops

Centre for Advanced Computing:
There is a summer series which you can sign up for here: https://www.eventbrite.ca/e/the-cac-summer-school-series-tickets-103834228974

Compute Canada workshops: https://www.calculquebec.ca/en/academic-research-services/training/
Data management & computing

Open science & data accessibility

We strive to be an open science lab. Open science & data accessibility document written by Ananda.

Link to ananda’s presentation

Summary of presentation:

Open science is an umbrella topic (picture) that includes subjects like open access, open educational resources, open source, equity/diversity/inclusion, open data and citizen science.

Open source: use free options such as R, python, OSF (Open Science Framework - you can choose which parts are public versus private). Use R packages instead of paid software.

Open data: at which stage should data be shared and when? Raw data/clean data/analysed data (fear of being scooped?). If you publish processed data, it’s important to explain exactly what exactly has been done to the data. This depends on the project, sometimes it makes little sense to share raw data. Exception: covid related data.

Community engagement through citizen science.

EDI: people can access science regardless of their background and circumstances.

The general policy is to work on your own personal page and link it to the lab github page when the work is published. You can also work on the lab page if you wish to.

AWS glacier: raw data and processed data for long term storage/backup

Data management

Backup protocol written by Ananda.

High Performance Computing

We have access to High Performance Computing (HPC) resources hosted by Compute Canada. Please see this page for instructions on how to obtain an account. The main clusters we work with are Cedar, Graham, and Beluga. Instructions on how to use them are here.

Important: please clear any files and directories from the cluster that you don’t need! Compute Canada has a fixed limit of 500k files for home directories. Once we approach the maximum storage capacity, we won’t be able to install new packages. Strategies for reducing the number of files can be found here.
Codesharing & GitHub

We have a lab GitHub account to help us share our scripts and collaborate more effectively. You can read how to contribute your own code and use the repositories here. GitHub is free for students. Read more about students access here: https://education.github.com/pack.

Good enough practices in scientific computing by Wilson et al. 2017.

Licensing and intellectual property.

VPN

When you are not connected to the McGill network, you must use the VPN to access McGill restricted sites and resources. Instructions on how to access the McGill VPN can be found here.

Molecular laboratory

Our molecular lab is located in N6/15 (Room 15 of the 6th floor of the North Wing) of the Stewart Biology Building. This lab includes a dedicated eDNA room. We also have lab space on the 4th floor of the South Block of Stewart Biology (currently under renovation, room numbers TBD).

Using the lab during COVID-19

We have a sign-up sheet with the Cristescu people for using the lab during the ramp-up of research activities. Only one person can be in the lab at a time.

If someone is using the eDNA room, a cone must be placed outside the door. Keep a minimum 2 meter distance to everyone in the building. Face masks must be worn when a 2 meter distance is not possible.

Before coming to campus, you must submit a self-assessment form to the PI (if the link does not work, you can find the form in Minerva under the ‘Personal’ tab).

Required reading:

Post on the ‘covid-19_response’ channel on Slack whenever you enter and leave the lab.
Safety

General safety
Please refer to McGill’s Lab Safety Manual about any questions regarding safety. Please also check Marco’s notes on general lab safety. Also, be aware of the lab safety responsibilities of laboratory directors, laboratory personnel and visitors.

In case of an emergency or immediate danger, call 911. The emergency procedure summarises what to do in various scenarios (fire, chemical spill, elevator emergency, etc.). You can contact McGill Security services for general inquiries (514-398-4556) as well as emergencies (514-398-3000).

Inspection
Please make sure the lab is kept clean and that safety regulations are followed at all times. This will help us pass an unexpected safety inspection. Please refer to the inspection checklist regularly to assess the state of the lab.

Fire extinguisher
Everyone working in the lab should know how to use a fire extinguisher. Instructions on how to use a fire extinguisher can be found here. You can also sign up for fire extinguisher training by emailing the Fire Prevention Office. The fire extinguisher needs to be checked at least once a year. Please follow the instructions on McGill’s website on how to check whether the fire extinguisher needs maintenance.

Eye wash station
There is an eye wash station directly in front of the entrance door, next to a sink. The station needs to be tested weekly, to be recorded on the attached sign in sheet.

Emergency shower
The nearest emergency showers are located at the end of the N6 hall behind the elevators.

PPE
Appropriate personal protective equipment (PPE) must be worn at all times in the lab. Gloves and lab coats are mandatory regardless of whether you are doing experiments or not. Shorts should never be worn in the lab.

Gloves
Gloves are mandatory in the molecular lab, even when you are not doing experiments. Not all gloves offer suitable protection against the materials we handle in the lab. If you are unsure which type of gloves to use, check out this glove comparison chart.

In general, nitrile gloves give good protection against most chemicals, but not all. For example, nitrile gloves provide limited protection against alcohols and ketones (such as acetone). Check the nitrile glove
chemical compatibility reference in Google Drive for more information. If you’re handling solvents, wear a pair of latex gloves on top of nitrile gloves.

Additionally, cryogenic gloves should be worn for handling samples at -80°C and heat resistant gloves should be worn for autoclaving.

Soiled gloves can contaminate objects and surfaces and increase the risk of exposure to hazardous chemicals. When this occurs, you can unknowingly be exposed to chemical hazards and develop acute health symptoms. Determining which chemical was the source of the exposure can be difficult, which is why labs should do their best to minimise cross-contamination. To reduce the risk of cross-contamination, change gloves immediately after each chemical-handling task. Never reuse disposable nitrile gloves. Before leaving the lab, always remove your gloves and wash your hands. Do not wear gloves outside the lab in hallways, offices, elevators and restrooms. Also, please note that the keyboard and computer are no-glove areas in the molecular lab.

**Footwear**

Keep a pair of closed-toe shoes in the lab specifically for lab work. No flip flops, sandals, or open heel shoes are allowed in the lab. If you do not have a pair of lab shoes yet, please use shoe covers. We have a shoe rack in the lab where you can keep your lab shoes. The top two tiers of the shoe rack are dedicated for lab shoes and the bottom tier is for outdoor shoes (to prevent dirt and water from soiling the lab shoes, especially in the winter).

**Lab coats**

Knee-length lab coats must be worn in the lab at all times. The eDNA room has separate lab coats that should never be worn in the main lab. McGill also has a lab coat laundry service (please do not wash lab coats at home - they may have hazardous chemicals on them that could cause contamination and get into waterways).

**Eye & face protection**

Goggles
Safety glasses with side-shields
Face shields
Surgical/procedural masks

**Training**

Before using the lab, you must be trained in-person by the lab manager/technician about the general safety practices and other important aspects of working in the molecular lab. After training, please complete the Laboratory Safety Orientation Checklist and return it to the lab manager/technician.

In order to work in the lab, you must complete all the relevant safety training:

1. **WHMIS 2015.** WHMIS-2015 training is required for graduate students working in wet labs, as well as undergraduate students performing special research projects, participating in the Summer Undergraduate Research in Engineering (SURE) program and/or internship or co-op projects where hazardous materials are used.
2. **Hazardous Waste Management**

3. **Biosafety training**

Please upload your e-certificates in your personal folder on Google Drive once you have completed all the mandatory training. If you do not have a folder yet, please create one. Certificates will usually be emailed about four weeks after the course.

Safety training courses are usually **valid for 3 years** after which they must be renewed in order to keep working in the lab! Once you (or an undergraduate who worked with you) leaves the lab, please move the e-certificates to the folder for ex-lab members.

**First aid training**

If you're interested in taking first aid training, please sign up here. The course offered by McGill is free for employees. The course costs $128.80 for students, but Rowan has expressed that he is willing to cover the cost if a student in the lab wants to take the course.

**Rules**

- **No food or drink in the lab ever.** This includes water bottles!
- **Always wear gloves**, a lab coat and other necessary PPE. The only exception is the Barrett lab computer area - no gloves should be worn here.
- **No open top / open heel shoes in the lab.** Please keep a pair of appropriate shoes in the lab specifically for lab work. The top two tiers of the shoe rack are dedicated for lab shoes and the bottom tier is for outdoor shoes (to prevent dirt and water from soiling the lab shoes, especially in the winter). Alternatively, you can use shoe covers - we have some in a bin next to the shoe rack.
- **Do not wear lab coats, lab shoes and gloves outside** the designated laboratory area.
- **Wash your hands before leaving the lab, even though you wear gloves!** Use the pedal under the sink to avoid touching the tap. Hand washing reduces the risk of contamination of toxic chemicals and biological agents outside the laboratory. It also protects you from contamination, as gloves do not always provide full protection from hazardous materials.
- **Do not apply cosmetics** (makeup, lip balm, hand lotion, etc.) in the lab.
- **Keep work surfaces clean.** This includes the sink!
- **Clean up after yourself.** Empty waste buckets, clean equipment, wash up your glassware and disinfect the bench. Leave the work area clean for the next user!
- **Label all deliveries** you receive as follows:
  - **lab name** (Barrett)
  - **date received** (e.g. ‘Rec. January 2019’)
  - **date opened** (e.g. ‘Opened 15 April 2019’)

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- N.B. Please avoid ambiguous date notation. For example, 12/1/20 could be interpreted as ‘20 January 2012’ or ‘12 January 2020’.

- Dispose your chemical waste correctly. You are responsible for the appropriate disposal of the waste you generate. Aim to reduce the amount of chemical waste you generate as much as possible and substitute harmful chemicals with safer alternatives whenever you can.

Good laboratory practices

- Keep a lab journal. Recording detailed notes regarding experiments and lab work helps with trouble-shooting. Documentation of your work also acts as proof of having completed the work. Electronic lab notebooks are an option, if you prefer accessing your notes from a computer.

- Use sample datasheets where you record sample IDs, extraction dates, PCR results, etc. Share it with the PI or other people who may need to work on the same samples.

- Be mindful of others running experiments at the same time. You may need to coordinate with others to use popular equipment and work stations.

- Before graduating or leaving the lab, make sure you complete the molecular lab part of this checklist. Please note that the section regarding the molecular lab can be completed when you no longer expect to do lab work.

- We have a limited amount of drawers in the lab. To keep things fair, each lab user should only have one personal drawer. If you do not expect to do lab work in the next 6 months, please empty your drawer so that an active lab user has somewhere to store their things.

- Whenever you come into the lab, please check if the drying rack above the sink needs emptying. The drying rack is not meant for long-term storage. Move any dry bottles, flasks, cylinders and gel parts to their appropriate places. Try to make this a habit, so that there’s space to dry tube racks and beakers you wash up after experiments. If you don’t know where something belongs, please ask.

- The eye wash needs to be checked once a week. When you come into the lab, please check if it has been tested. Pull the eyewash slowly to avoid flooding the desk and write down your initials on the eyewash card.

- We have some complicated and delicate equipment in the lab. If you are unsure how to use a piece of equipment correctly, ask someone.

Sustainability

Submitting samples to MGC

When submitting a project to McGill Genome Center, please ask Rowan for the lab’s log-in details for MGC’s online submission system at hercules.genome.mcgill.ca. A user guide can be found here.
Sample storage

All samples that can be stored at room temperature (RT), should be stored at room temperature. Cold storage is very energy-consuming, so only store samples at low temperatures when absolutely necessary. Careful labelling of samples is crucial.

Cold storage

Whenever possible, keep samples and reagents separate to avoid contamination.

The fridges and freezers require regular maintenance. Instructions for cleaning the condensers and defrosting can be found here.

Fridge

Only store items in the fridge that cannot be stored at room temperature. We have a large 4°C fridge and a small 4°C fridge in N6/15. Corrosives that need to be stored at cool temperatures can be stored in the box dedicated for corrosives in the small fridge.

Respect the division of the fridge: the left side is for the Cristescu lab and the right side is for the Barrett lab.

The cooling mechanism of the large 4°C fridge relies on airflow. Impeding the circulation of air can lead to erratic temperatures and overheating. Do not overfill the fridge, especially the top shelf. Leave plenty of clearance between the shelves (do not stack items too high) and distribute the load evenly, when possible.

Freezers

Only store items in the freezer that cannot be stored at room temperature or in the fridge. We have a large -20°C freezer, a small -20 °C freezer and a -80°C freezer in N6/15. We also have an additional large -20°C freezer in the hallway on N7 due to the lack of space and power outlets on the sixth floor. The general rule is to store items that aren’t actively used in the lab in the N7 freezer in order to free up space for active projects in the lab.

Everyone who is actively working in the lab has their own box for storing items in the large fridge and the -20°C freezer. Please let the other lab members know if you need a box.

The ultra-low freezer is only for storing samples that cannot be stored at warmer temperatures.
Chemical & reagent storage

Labelling
All reagents must be labelled with the date it was received and the date it was opened. This is crucial in order to keep track of expired reagents. All solutions made in the lab must also be labelled with your name, date and the complete chemical names and concentrations. Please note that we’re an international lab and date notation varies between countries, so please write out the name of the month and the full year. For example, 12-2-21 could be interpreted as 12 February 2021 or 21 February 2012.

Corrosives
All corrosive substances need to be stored in the yellow cabinet found in the Cristescu lab area. The top shelf is for the Cristescu lab and the bottom shelf is for the Barrett lab. Corrosives that require cold storage can be stored in the small fridge under the PCR machines in a corrosive resistant tray.

Only store compatible corrosives together. For example, acids and bases can react together violently. Do not store them beside each other. Use corrosion-resistant trays to contain spills or leaks. If you notice damaged containers or leaks in the cabinet, it is your responsibility to notify about the problem!

Flammables storage
All flammables need to be stored in the flammables cabinet underneath the fume hood. The right side is for the Barrett lab and the left side is for the Cristescu lab.

Ordering & receiving reagents
There are three steps to ordering items for the molecular lab:

1. Place the order on McGill Marketplace (MMP). Please check the instructions on how to place an order or request a PO on MMP.
2. Write down what you’ve ordered in the ‘New orders’ tab in the Barrett Lab Orders spreadsheet. Try to fill out all details.
3. When you receive the items, move it to the ‘Completed orders’ tab in the spreadsheet. Please also read the instructions for receiving orders for the molecular lab carefully.

Ordering filter tips
We usually order filter tips from FroggaBio. They usually have the following promotion: $69 per case when you order 5-9 cases and $62 per case when you order 10+. The promotion is not automatically applied to the cart. Instead, the company will charge a smaller amount of money from the account that
was used for paying. Please inform Carol Gaug from FST that the remaining encumbrance on the account is due to a discount (she contacts us regularly about encumbrances).

**Ordering masks (COVID-19)**

1. Login to MMP through Minerva
2. Click on the “ASTM-1 on-campus activities” logo
3. Enter the keyword “mask.” There will only be one result.
4. Update the quantity needed and Add to Cart
5. Click on View Cart and proceed with your order as usual

When ordering, try not to overestimate your amounts, to help ensure adequate supplies for all community members. Orders will be delivered to the current delivery hubs.

Please note that these orders are only for procedural masks to be worn by people circulating within buildings. Any PPE required for specific work environments, such as a laboratory, is to be ordered separately, as you have been doing.

**MyLab**

MyLab is an electronic inventory for hazardous materials used by research laboratories at McGill. Instructions on how to use MyLab can be found [here](#). You can either log in with the lab’s username, or with your McGill email and password. If you cannot log in with your personal credentials, contact [myLab.ehs@mcgill.ca](mailto:myLab.ehs@mcgill.ca) cc’ing Rowan.

There are two types of accounts for accessing MyLab. Full Access accounts can view and modify the full inventory and SDS documents. Read Only accounts are generic user accounts for the laboratory that allow multiple users to use the same account to view the full inventory and SDS documents.

You can also request hazardous waste pickup through MyLab.

**Laboratory information card (LIC)**

Each lab should have a laboratory information card (LIC) attached to the door. To update the current lab card, please use the lab card generator available through myLab. Only full access users will be able to edit and print the LIC. Instructions on how to use the lab card generator can be found in the myLab laboratory information card generator user guide.

The LIC is created by room and PIs who share the same room will need to add their respective contact information and the hazards/pictograms on the same LIC. Do not delete the information already present on the LIC from the other PIs. Add only additional information pertinent to you. The LIC must be printed ONLY after all PIs sharing the room added their required information. For shared rooms among several PIs, it is essential to communicate with all parties so that the information presented on the LIC is
accurate and up-to-date. Please note that each PI sharing the room must print their own laboratory information card. Please contact mylab.ehs@mcgill.ca if you have any further questions.

Safety data sheets
Everyone working in the laboratory must have access to safety data sheets (SDS). SDSs are widely used for cataloging information on chemicals and include instructions for safe use, potential hazards and spill-handling procedures. If you develop symptoms after being exposed to a hazardous material, please present the SDS information of the chemical to the healthcare professionals.

McGill uses two SDS databases. The McGill e-binder has all the SDS documents for every chemical used within the McGill research community. The other database is the MSDS online library which includes over 3 million MSDS documents. Instructions on how to use the online libraries can be found here.

Laboratory safety posters
Labs should also be equipped with relevant laboratory safety signs, such as the ones provided by McGill.

Chemical compatibility poster by Fisher.

List of incompatible chemicals here, here, and here.

MyLab sign.

PDF copies of lab safety signs created by Åsa.

Chemicals & Waste management
It’s important that all chemicals in the lab are properly stored, handled and disposed of. Proper storage involves having a dedicated storage area for different types of chemicals. Safe handling means that appropriate PPE is always used and handling of hazardous chemicals is restricted to fume hoods. Proper disposal of chemical waste involves following the EHS guidelines.

If you witness improper storage, handling or disposal of chemicals by another lab member, please bring this to their attention. Many people develop careless lab practices over time, which is why the primary person responsible for rectifying unsafe laboratory practices is the person witnessing it.

Chemical storage
Storing chemicals correctly is essential to maintaining a safe laboratory space. In the molecular lab, never store chemicals above eye-level and avoid overcrowding shelves.

All incompatible chemicals should be segregated according to hazard class. For example, we have separate storage cabinets for flammables and corrosives in the molecular lab. Bleach should be stored in the cupboards underneath the sink away from other chemicals. A non-comprehensive list of
incompatible chemicals and a table of basic chemical segregation recommendations can be found on Google Drive.

Physical contact is not always required for chemicals to react. Chemicals can seep or leak from open or damaged containers and react with nearby reagents. Always close caps firmly to prevent chemicals seeping out of containers into the air (that we breathe!). Wipe off any minor external leaks that may have occurred during use before placing a container back in its storage place. Use spill trays for harmful or highly reactive chemicals in case of accidental leaks.

Always make sure that the chemicals are labelled and have the relevant hazard warnings on them. If a label has worn off, you must replace it with a new detailed label.

All chemicals need to be updated in MyLab when depleted or re-stocked. Instructions can be found here.

All chemicals should be labeled and dated upon receipt and when opened for the first time. This is especially important for peroxide-forming chemicals (e.g. isopropanol, ethers, dioxane and tetrahydrofuran). Solutions also need to be clearly labeled and dated when prepared. Label all new reagents you receive with the following information:

- your first name
- date received (e.g. ‘Rec. January 2019’)
- date opened (e.g. ‘Opened 15 April 2019’)
- lab name (Barrett)
- N.B. Please use unambiguous date notation to avoid confusion. For example, 12/1/20 could be interpreted as ‘20 January 2012’ or ‘12 January 2020’.

## Chemical handling

Perform all steps involving hazardous chemicals inside the fume hood. Only work with materials once you know their flammability, reactivity, toxicity, safe handling and storage and emergency procedures. This information can be found in the material safety data sheets (MSDS).

Wear appropriate PPE. Use a lab coat to protect from spills and goggles for eye protection against sprays. Choose the appropriate type of gloves depending on what chemicals you are working with. Nitrile gloves are excellent for general use. Latex gloves give good protections against biological and water-based materials, but give poor protection against solvents and chemicals. You can always wear double gloves to increase the thickness, or you can wear two types of gloves to get the benefits of both materials.

Change gloves immediately after each chemical-handling task. Soiled gloves can contaminate surfaces and you can unknowingly expose yourself or others to chemicals with adverse health effects. Determining which chemical was the source of the exposure can be difficult, which is why labs should do their best to minimise such contamination. Never re-use disposable nitrile gloves. Before leaving the lab, always remove your gloves and wash your hands. Do not wear gloves in hallways, offices, elevators and restrooms. Also, please note that the computer area is a no-glove area in the molecular lab!

Sometimes accidents happen. Report any accidents or dangerous incidents (“near-misses”) promptly to the principal investigator.
Fume hoods
Perform all procedures that involve hazardous chemicals in the fume hood. Chemical fume hoods are ventilated enclosures that usually vent separately from the building’s ventilation system. They are able to capture and exhaust even heavy vapours. **Do not use biosafety cabinets for handling hazardous chemicals** - they are not designed to capture chemical vapours and will not protect you from fumes! You might also end up damaging the BSC. More information on BSCs can be found [here](#). Also, **do not use PCR hoods for handling hazardous chemicals**. These laminar flow hoods push the air towards the user to minimise contamination of products inside the hood. For more information on PCR hoods, click [here](#).

For safe and efficient use of the fume hood, only keep materials needed for ongoing experiments inside the hood. Clutter will disturb the airflow and reduce the efficiency of the equipment. When it is necessary to keep a large apparatus inside a fume hood during an experiment, it should be placed upon blocks or legs to allow air to flow underneath.

Operate the hood with the sash as low as practical. Work as far into the hood as possible (a minimum of six inches). Do not lean into the hood, this disturbs the air flow and also places your head into the contaminated air inside the hood.

Fume hoods use a lot of energy. Always close the sash when the fume hood is not in use.

**Chemical spills**

[Chemical spill procedure](#)

**Chemical waste disposal**

Every user of the molecular lab is responsible for disposing the chemical waste they produce. Unused or unopened chemical waste can be disposed in their original container (assuming they have not been removed and poured back in). All other waste must be disposed in containers provided by EHS.

EHS provides containers for different types of waste. The yellow containers (10L) are for corrosives and the white containers are for solvents (available in 10L and 20L). You can pick up an empty container from the 3rd floor in N3/17. Ask Joe at the receiving for the key and he will show you where to find the containers if you are picking one up for the first time.

Only mix compatible chemicals in a waste container. A chart of incompatible chemical groups can be found [here](#). You can check the category of the reagents in the safety data sheets. Use separate yellow containers for basic and acidic corrosives. Fill out the tag on the container completely without using abbreviations for chemical names. Never fill the container above the top line. Do not store chemical waste containers in labs indefinitely - dispose of any waste as soon as you are done with your work, even if you have only accumulated a small volume. Bring the waste back to N3/17 and sign the log sheet at receiving. EHS picks up the waste weekly and will not accept any other containers than the white and yellow ones.

**Disposal of tips used with hazardous chemicals**

[Tips that have been in contact with hazardous chemicals - instructions.](#)
Reusing chemical bottles

When reusing old chemical bottles, make sure the container is properly rinsed and relabeled. All waste must be compatible with the original contents of the container. Also, make sure the composition of the container is suitable. For example, acids and bases corrode metals, hydrofluoric acid corrodes glass and solvents can degrade plastics.

Ethanol

Ordering ethanol. Ethanol log sheet.

Biohazardous materials

What are biohazardous materials + required training + biosafety manual

In order to work with biohazardous materials, the PI needs to submit an application form before starting new projects involving biohazardous materials. Requests are usually approved in 7 working days. The application must be renewed annually by filling in this form and a new application must be submitted every 5 years. More information about the application process can be found here.

Biosafety cabinets

Biological safety cabinets should be used when working with biological materials that can liberate infectious particles and aerosols. They also minimize contact between the operator and biological materials through the use of directional inward airflow, a physical barrier and HEPA filtration. The class of the BSC

BSCs are ineffective against gases, so do not use BSCs with hazardous chemicals. Most models recirculate air back into the laboratory and the hazardous chemicals can damage the HEPA filters.

Disposal of animal carcasses

Please contact Hazardous Waste Management (hwm@mcgill.ca) for the disposal of anatomical parts and odourous carcasses from Stewart and Redpath, especially dead fish. Do not dispose smelly things in the anatomical waste drums on the third floor in Stewart. Someone will pick up the waste directly from the lab to prevent odour from accumulating in the biowaste room.

Only dispose sealed, double-bag, non-odourous, dry anatomical parts in the biowaste drum on the third floor of Stewart Biology (ask Joe for the key).
eDNA room

The eDNA room is only for low-copy DNA projects which are highly sensitive to contamination. You must be trained before being allowed to access and work in the eDNA room! Please read the rules of the eDNA room before training.

Rules:

- The eDNA room is only for pre-PCR eDNA samples.
- No tissue or bulk samples should be taken into the eDNA room.
- PPE:
  - Shoe covers are mandatory, unless you have a separate pair of shoes for the eDNA room.
  - Only use eDNA lab coats in the eDNA room. Place your named lab coat in the hamper once every two weeks for washing.
  - Always change your gloves when you enter the eDNA room from the main lab.
  - Wear a hairnet and face mask.
- Researchers should not work in the main molecular lab* before working in the eDNA room. This is to prevent PCR amplicons from contaminating the space.
  - *Other places where PCR amplicons may be present at high quantities include other labs and for example McGill Genome Centre. You may only enter the eDNA room after working in the main molecular lab or other similar spaces if you have showered and changed shoes and clothes first.
- Order separate reagents, tips, paper towels, PPE, equipment, etc., for the eDNA room. These should not be shared between the labs, so make sure you have sufficient stocks before you start a project.
- Only use filter tips.
- Keep a separate eDNA notebook in the lab - do not move it around between labs. Disinfect the notebook with bleach when bringing it to the lab for the first time.
- Do not dispose gloves in the yellow bin! We’ve received complaints about this. Gloves fill up the yellow bin very fast and we pay for disposal by weight.
- Clean all surfaces before experiments (including bench top surfaces, taps, drawer handles, underside and top of lab shelving).
  - Surfaces should be wiped down again with distilled water or ethanol, to avoid spoiling lab benchtops with residual stain marks.
  - Clean pipettes with ethanol or DNAaway.
**PCR hood**

PCR hoods (also known as clean benches or laminar flow hoods) filtrate the air that is sucked into the hood, providing sample protection from contamination. However, the air is pushed out of the hood towards the user, meaning that it is **not suitable for handling hazardous chemicals**, as it doesn’t provide any user protection.

The AirClean 600 PCR Workstation (model AC648) requires regular maintenance. It has a UV light and filters that need to be changed when they have reached the end of their lifespan. This is indicated by an alarm that will sound when a filter change is due. There are two types of filters that need to be changed regularly to ensure clean air flow. **Pre-filters** should be changed every **3 months** with average use and the **HEPA filters** need to be changed every **18-24 months**. Instructions on how to change the filters can be found [here](#). Also, please remember to update the Equipment maintenance log after changing the filters.

Filters can be ordered on MMP through Fisher Scientific. The models are listed below:

- **Pre-filter** model 648 (package of 12 filters), catalog number ACFLFPRE-7
- **HEPA Filter** model 648 (two HEPA filters are required for our PCR hood), catalog number ACFHEPA-18

**Equipment maintenance & repairs**

**Equipment list**

A list of all our equipment can be found here: [Barrett lab equipment list](#). Please add any new equipment you have purchased to this list and remove any old equipment we no longer have.

**Equipment disposal**

Contact Carol Smith-Verdone for the disposal of broken equipment. You will need to fill in a form about the decontamination of equipment before the disposal request can be made by Carole. Equipment that has been in contact with hazardous chemicals, biohazardous substances or radioactive materials need to be decontaminated appropriately. Attach the completed decontamination form to the equipment and keep a copy for your records.

**Maintenance protocols**

The equipment in the lab need regular maintenance in order to function accurately and precisely. Please record ALL servicing and maintenance in the Equipment calibration & maintenance log and provide sufficient details on the issue and service provider. Descriptions on how to request servicing for some commonly used equipment can be found below.

**Pipette calibration**

In order to maintain accurate and precise pipetting results, pipettes need to be calibrated at least once a year, or whenever noticeable inaccuracies can be observed. Waldo Lefener ([Lefever.W@eppendorf.com](mailto:Lefever.W@eppendorf.com))
from Eppendorf usually calibrates our pipettes. He usually sends out an email once a year when he knows the dates during which he will be doing pipette maintenance at McGill. Additional instructions regarding pipette calibration can be found here.

**TECAN Spark servicing**
Fill in the web form at [https://lifesciences.tecan.com/support/helpdesk](https://lifesciences.tecan.com/support/helpdesk). You will need to fill in your contact details, the serial number and a description of the issue you are experiencing.

**Freezer & refrigerator maintenance**
Cold units require regular maintenance in order to function properly. Cleaning the condensers and defrosting twice a year will help reduce the amount of energy the equipment consume and extend their lifespan. Please refer to the manufacturer manuals for specific information about maintenance and troubleshooting for each model. You can also find physical copies of the manuals in the blue binder above the computer area.

**Condensers**
Condensers should be cleaned at least every 6 months or more often if the laboratory area is dusty. In heavy traffic areas, condensers load with dirt more quickly. Failure to keep the condenser clean can result in equipment warm-up or erratic temperatures. Information about condenser location and cleaning procedures can be found in the manufacturer’s manual. You can borrow the backpack vacuum cleaner cleaner in N5/12 (the door is unlocked) to remove excess dust.

*General instructions:*
1. Disconnect the power.
2. Remove the cover at the bottom front of the unit by lifting it up and towards you.
3. Remove all dust (preferably with a vacuum).
4. Place the cover back on.
5. Reconnect power.
6. Record the cleaning in the lab maintenance log online.

**Defrosting freezers**
Freezers need to be defrosted at least every 6 months or when the layer of frost is more than 0.5 cm. Consider defrosting sooner rather than later - the more ice and frost accumulates, the longer the defrosting process will take and the more water you will have to mop up!

Regular defrosting is essential for extending the life-span of cold units and also for saving energy. The cooling capacity of freezers with frost buildup is considerably worse for your samples too, not to mention that entire boxes can get buried inside the frost and the cardboard can disintegrate when it gets wet during defrosting.

Stewart has a -80 freezer on the third floor that can be used for temporary storage of samples while defrosting. Talk to Joe in order to make a booking. We have a towel in the lab for wiping off water (currently located in one of the drawers underneath the PCR machines). A mop can be found on the fifth floor in the cleaning cupboard in N5/12.
**Power-cuts**
If possible, keep the fridge/freezer doors closed until the power is back on. Note that our freezers and fridges are not plugged into emergency outlets. Emergency outlets can be recognised by a red frame around the outlet. They are connected to a generator in Stewart which will kick in immediately if there’s a power cut. The -80 has a CO2 back-up system in case of a freezer failure or power cut. Instructions for the back-up system can be found [here](#).

**Freezer/fridge failure**
What to do if a fridge or freezer breaks?
1. Inform everyone in the lab about the issue.
2. Relocate samples to other freezers. If we don’t have enough space in the lab, contact other labs to ask for help with temporarily storing samples. Freezers and fridges often accumulate expired reagents etc that are no longer needed. Consider disposing such items if you come across them.
3. Troubleshoot. Appliances usually come with a manual with troubleshooting steps.
4. Check if we have a service contract for the appliance.
5. Contact Carole to arrange servicing (ask for FAOPAL)

**Fume hood maintenance**
The performance standard for fume hoods is the delivery of a minimum face velocity of 100 linear feet per minute at half sash height. An anemometer for determining a fumehood’s face velocity is available from EHS.

**Biosafety cabinet maintenance**
Biosafety cabinets must be tested and certified annually. Cabinet performance must also be evaluated upon initial installation, when moved (even when moved from one area to another within the same room), whenever maintenance is carried out on internal parts, and whenever filters are changed. Annual certification is provided at no charge, and can be arranged by contacting EHS.

Costs of certification of new installations, relocated cabinets, and units that have been repaired are the responsibility of the user. Testing and certification must be done by a certified company. The HEPA filter must be decontaminated by a certified company prior to moving a BSC or prior to changing the HEPA filter.

The above information is adapted from the [McGill Biosafety Manual](#).

**Equipment protocols**
We have a lot of complicated and delicate equipment in the molecular lab. If you are unsure how to use some of the equipment, please ask an experienced member of the lab to train you.
Molecular protocols

Please avoid creating duplicate versions of protocols in Google Drive. This creates confusion and makes it difficult to figure out which version is more up-to-date. If you want to create a new version of a molecular protocol with your own modifications while also keeping the original version, please rename the duplicate clearly in a descriptive way. Also, please add a paragraph at the start of the document describing the changes to the original protocol, and highlight these sections in the new version. The paragraph should also include information such as your name, date and reason for modifications.

DNA extraction protocols

Anolis extraction protocol
Darwin’s finches extraction protocol
Stickleback extraction protocol
Extraction data sheet

DNA cleanup protocols

Nucleospin DNA cleanup

DNA size-selection protocols

Pippin prep
KAPA beads clean-up

Double digest restriction-site associated DNA

ddRADseq

Sample storage
DNA storage

Tissue storage

https://evol.mcmaster.ca/~brian/evoldir/Answers/Tissue.storage.answers

Animal care

Training

General information about working with animals can be found here. Working with animals requires the successful completion of specific training courses. The courses you need to take will depend on the study organism.

Occupational Health Program

Participation in Occupational Health Program (OHP) is mandatory for personnel in contact with non-human primates. OHP is a prevention program related to occupational diseases, as well as diseases and incidents involving animals.

For McGill staff, the OHP provides all necessary vaccinations and medical surveillance through appointments in the Occupational Health Clinic as well as medical support services in the event of an exposure. Appointments to see the nurse in the Occupational Health Clinic can be made by contacting the OHP Administrator at 514-398-4766 or by email.

For McGill students, the OHP provides medical support services in the event of an exposure, as well as bi-annual PPD testing clinics for non-human primate users in the Occupational Health Clinic. Students participating in the program receive their vaccinations by contacting the Student Wellness Hub, but can contact the OHP Administrator at 514-398-4766 or by email to book an appointment in the Occupational Health Clinic for a measles titer.

The above information is adapted from here.

Animal use protocols

Information on animal use protocols, DARWIN

Quality Assistance Program

All animal use protocols approved at McGill University are subjected to post-approval monitoring via the Quality Assistance Program (QAP). The aim of the QAP is to ensure that research and teaching activities involving live vertebrate animals are conducted in accordance with all applicable laws and regulations.
One crucial component of the QAP is to observe the methods employed by researchers as well as the conditions in which the animals are handled. For wildlife protocols that take place in the field or overseas, the FACC will be requesting the submission of photos and/or videos, to illustrate the animal-based procedures, environment and equipment used (e.g. capturing, handling, restraint, holding areas, injections, etc.). More information, please visit the QAP website or contact animalqa@mcgill.ca.

**Phytotron**

If you require your animals to be kept under controlled conditions (e.g. light, temperature), a growth or greenhouse chamber in McGill’s Phytotron is a potential option. For more information, you can contact the Phytotron’s managers: Mark Romer (mark.romer@mcgill.ca) and Mahnaz Mansoori (mahnaz.mansoori@mcgill.ca).

**Animal care protocols**

**Aiptasia**

**Permits**

**Exporting & importing samples**

**Exporting & Importing samples**

**Fieldwork**

Boat training
Firearms training
Permits
Exportation/importation of samples
Security
Equipment inventory
Vaccinations
Animal use protocols & quality assistance program
Shipping, ordering & receiving

The information in this section is largely adapted from ‘Receiving and shipping mail/packages’ written by Caroline in 2015. The original version of the document is kept on Google Drive. Please update this section of the lab manual if you notice that some of the information has changed (no need to update Caroline’s original document).

Shipping

Internal mail
You can ship things free of charge within McGill’s internal mailing system. All mail should be clearly labelled with the recipient’s name, building, room number, and department. Place the mail in the bag hanging behind the door in room 102 in the museum. The bag in the museum is both for internal and external mail. When shipping from Stewart, place the mail in the bag specifically for internal mail in W4/2.

External mail
External mail is first processed by McGill mail services, then by Post Canada. Allow an extra day or two for processing. If you need a tracking number, consider shipping directly from a Post Canada office. Shipping directly from a Post Canada office is faster, since the shipment will not be subject to processing by McGill. External mail is not free of charge, so please check with Rowan before shipping large items or shipping something internationally. All shipments must be labelled with the complete address, including city and postal code. For international shipments, also include the country. Place the mail in the bag behind the door in room 102. When shipping from Stewart, place the mail in the bag specifically for external mail in W4/2.

FedEx
The lab has a FedEx account. Shipments will automatically be paid by the p-card which is attached to the account. Please ask Rowan if you need to ship something with FedEx.

Express shipping
Express shipping delivers shipments within 48 hours. You can schedule shipment with the McGill preferred courier service, Globex. The Museum has an account for this. Make sure your package is ready to go, then see Marie La Ricca or Caroline LeBlond to fill in the request for parcel pick up. Leave your package in room 102. If room 102 is closed, leave your package in the corridor in front of the office for Globex to pick it up.
Shipping samples

Permits
Make sure you have all the necessary permits for shipping samples. The permits you need will depend on what species you are shipping and its IUCN classification, as well as what type of material you are shipping (live specimens, blood samples, DNA extracts, faecal samples, etc). Please note that some types of material is easier to get permits for than others. For example, getting permits for shipping DNA extracts is usually easier than shipping blood and faecal samples. This is particularly relevant for samples from endangered species where governments have strict regulations on returning unused tissue and material to the country of origin. If you only need genetic data, plan to do the extractions in the country you collect the samples (if possible) and ship only the DNA to minimise the amount of material that needs to be returned. This minimises the paperwork and logistics of the project. Some sample types have been assessed by McGill University, Environment, Health and Safety (EHS), as not requiring an import permit. Please contact Rowan to determine the specific protocol for your work, as well as this documentation from EHS, if applicable.

Customs broker
Using a customs broker is highly recommended when shipping samples. The custom’s broker will be contacted if any issues arise at the border. Thompson Ahern International is the university's contracted vendor for international shipments and payments are usually done by FAOPALs. Please contact mcgill@taco.ca to arrange shipment. You will need to provide details on package size, weight, destination and type of material for the invoice estimate. If you are receiving samples from another academic institution, you will also require a customs broker.

Packing samples
It’s important to pack your samples appropriately. Fedex has a useful guide on how to pack perishable samples. Genohub also has a very useful article about how to pack samples for sequencing, and the following information is largely adapted from their website.

If you are shipping DNA or RNA samples, consider using screw cap tubes. Wrap the tubes in parafilm and place them in cryogenic freezer boxes. Choose a thick styrofoam box (about 4 cm) and fill it with dry ice or wet ice packs. Fedex requires you to fill out additional paperwork when shipping dry ice (since it’s considered a dangerous good), so avoid using it unless you really have to. RNA samples should be shipped on dry ice, but DNA can be shipped on wet ice.

The amount of ice will depend on the shipping distance. For shipments within your continent, use about 4kg of ice. For shipments to Europe, use 6kg of ice and for shipments to Asia and South America, use 9kg. A styrofoam box that is 4cm thick, 3-4 kg of dry ice should last for more than 48 hours.

Place the styrofoam box inside a suitably sized cardboard box. The cardboard box will protect the styrofoam box from breaking. Fedex can refuse to pick up polystyrene boxes without an outer cardboard box. Label the box as ‘non-hazardous research sample’ and ‘temperature sensitive, keep frozen’.

Some tissue samples may need to be shipped at ultralow temperatures (e.g. samples for epigenetic work). The most reliable option is to ship the samples in a cryoshipper. Please be aware of these cryoshipper properties before shipping.

Please note that the amount of ethanol per shipment might be limited to 500ml in some cases.
Documents

All international shipments require a commercial invoice. If you don’t include a commercial invoice, your shipment can get delayed at the border indefinitely until you provide one. Always include a copy of your commercial invoice INSIDE as well as on the OUTSIDE of the package. Instructions on how to fill out a commercial invoice can be found here.

The details of your shipment will determine which documents are required. The most commonly required documents for international shipments, in addition to the commercial invoice, include:

- an export declaration (not required for shipments to the US and not required for commercial goods with <2000 CAD value);
- a certificate of origin (required to demonstrate that a good was wholly produced in a given country for import duty purposes);
- a toxic substances control act form (needed if shipping hazardous materials, including dry ice).

These documents can be found on the Fedex website - do not attempt to create the forms yourself.

Samples will typically be shipped using a courier service as explained above in the ‘Express shipping’ section. Always choose a shipping option with tracking!

Please read the FedEx international shipping guidelines for more information.

Importing samples

There may be restrictions on what you can import across the border to Canada. The primary source for information is the Canadian Border Service Agency (CBSA). What you can import will depend on the species as well as the type of material (tissue samples, carcasses, live specimens, blood samples, DNA extracts, etc). You will want to check for import requirements in the Automated Import Reference System (AIRS) for commodities regulated by the Canadian Food Inspection Agency (CFIA). If you require a permit to import, you can request it through the Agency’s online service portal, My CFIA.

Ensure that the shipper has completed all necessary documentation (i.e. Export Declaration etc), and provide the shipper with all required information. We encourage the shipper to include a letter from the PI detailing a description of the samples (i.e. research samples collected under permit XXX for purposes XXX), and include Asa’s name and contact information on the shipping label, if possible. International mail should be addressed as follows:

YOUR NAME
Barrett Lab,
McGill University,
Stewart Biology Building (N3/17),
1205 Dr Penfield Ave,
Montreal, Quebec
H3A 1B1, Canada

Ordering

McGill Marketplace (MMP) is the recommended way to purchase items for the lab. Please check the instructions on how to place an order or request a PO on MMP. If you need to cancel an order that has already been approved, please notify the vendor and fill in this form online.
Receiving

Location

Orders can be shipped to the Museum or Stewart Biology as appropriate. Mail will be delivered to 102 in the museum, where each lab also has an assigned mailbox. In Stewart Biology, mail is primarily delivered to room N3/17, and sometimes to W4/2.

Instructions for receiving items

When receiving an order, always verify that the order is for the Barrett lab. Open the parcel and look for the packing slip or invoice (can be inside or in a plastic pocket outside the box). Double check the items listed on the packing slip are included in the box. Make sure quantity, size and format match with the packing slip.

If the order is complete (all items on the packing slip are in the boxes), write the date and your initials. Store the items where appropriate and recycle the empty boxes in the green recycling bin in the corridor. Additionally, for molecular lab orders, please label all the items you receive as follows:

- your first name
- date received (e.g. ‘Rec. January 2019’)
- date opened (e.g. ‘Opened 15 April 2019’)
- lab name (Barrett)
- N.B. Please use unambiguous date notation to avoid confusion. For example, 12/1/20 could be interpreted as ‘20 January 2012’ or ‘12 January 2020’.

If the order is not complete (items on the packing slip are missing or the items on the packing slip do not match the contents of the shipment). Write a clear note on the packing slip, the date and your initials. Do not unpack the wrong item for now. Leave aside for potential return.

Sometimes shipments are missing items and they are shown as ‘BO’ on the packing slip. This means that the item is backordered and the company is waiting for the item to be restocked. Consider such orders complete for now.

ALL PACKING SLIPS AND INVOICES SHOULD BE PLACED INSIDE THE BLACK FOLDER ABOVE THE COMPUTER IN THE MOLECULAR LAB.

Personnel resources

- Lab manager: Åsa Lind
  - Scope of work
  - Tasks
- Redpath admin
  - Caroline LeBlond
  - Ginette Dessureault, 514-730-5942
- **Biology admin**
  - Ancil Gittens
  - Carol Verdone-Smith
- **FST**
  - Carol Gaug
- **Museum collections**
  - Anthony Wayne Howell

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**University resources**

**Indigenous**

[First People’s House](#) offers student support, organises cultural events as well as residence for indigenous students. They also provide academic support, such as subsidized tutoring and monthly workshops. McGill also has [scholarships and bursaries](#) specifically aimed for indigenous students.

**International Student Services**

**Disability services**

- **IT**
  - Computers and servers
  - Internet
- **Services (access)**
  - Health care
  - Child care
  - Financial aid
  - Career service
- **Student counseling**
- **International students**
- **Your association**
- **Registration**
- **Disability access service**
- **Indigenous:**

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**Teaching resources**

- **Academic writing:** [https://advice.writing.utoronto.ca/student-pdfs/](https://advice.writing.utoronto.ca/student-pdfs/)
- Formatting reports: https://owl.purdue.edu/
- Citation resources at McGill: http://libraryguides.mcgill.ca/citation
- Teaching and Learning Services at McGill: https://www.mcgill.ca/tls/instructors
- Active learning activities, University of Waterloo: https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/developing-assignments/assignment-design/active-learning-activities
- STEM active learning activities, by topic: https://www.saltise.ca/resources/activities/
- myDALITE: https://mydalite.org/en/
- SALTISE: https://www.saltise.ca/
- General teaching strategies and approaches: https://www.saltise.ca/resources/strategies/
- Free iClicker interface: https://app.reef-education.com/#/login

Learning resources

Courses at McGill

The lab has put together a list of relevant graduate courses at McGill to help others choose relevant courses. Please add to this list any relevant courses you’ve taken during your degree!

Textbooks

Borrowing textbooks

Buying textbooks can be very expensive, so you might want to check if the book can be borrowed from somewhere. The lab has a collection of textbooks that anyone in the lab can borrow. Please use the sign-out sheet when you borrow something, so that we can keep track of the books!

Other places to find textbooks include the university libraries and various publishers with free online textbooks. For example, here’s a list of free books by Springer. McGill Community for Lifelong Learning also has a list of resources for finding books (including audiobooks, e-books and fiction).
Recommended textbooks
Below are some suggestions that other people in the lab have found useful. Feel free to add your own recommendations!

- R for Data Science by Garrett Grolemund & Hadley Wickham
- Bioinformatics for Evolutionary Biologists by Bernhard Haubold & Angelika Börsch-Haubold.
- The Analysis of Biological Data by Whitlock & Schluter.
- Biostatistics online course by Yaniv Brandvain

Science blogs & podcasts
Know of any good science blogs? Please add them to the list below!

- Computational Biology and Genomics blog by Dave Tang.
- Eco-evo eco-eco blog by Andrew Hendry, Daniel Bolnick, and others.
- Dynamic ecology by Jeremy Fox.
- The Biology of Superheroes, a popular science podcast by Shane Campbell-Staton and Arien Darby.
- Heredity podcast
- The insight genetics podcast.

Online course providers

- McGill Community for Lifelong Learning has a list of online course providers.
- Coursera offers a wide variety of online courses by universities and companies.
- MIT OpenCourseWare Massachusetts Institute of Technology has a selection of free courses.
- FutureLearn offers short courses on a variety of subjects.
- edX an online learning platform founded by Harvard and MIT.
  - “Analyze Your genome!” University of California, San Diego
  - “Data Science: Computational Thinking with Python,” University of California, Berkeley

Forums

Bioinformatics

- Biostars https://www.biostars.org
- Seqanswers http://seqanswers.com
- Unix http://unix.stackexchange.com
Coding

- Stackoverflow http://stackoverflow.com
- Cross Validated http://stats.stackexchange.com

General Biology

- http://biology.stackexchange.com

Programming & Data Analysis

- Advice on how to Teach yourself programming in 10 years by Peter Norvig.
- Online programming resources:
  - Software carpentry organises workshops and has online tutorials on how to get started with R, Python, Bash and Git.
  - Data carpentry's tutorials specifically aim to teach data management and analysis for genomics.
  - Codacademy has a wide range of courses in different programming languages.
  - Bioinformatics training resources by the Coppola Lab has compiled a lot of useful learning resources into one place.
  - Harvard Informatics Group has a GitHub page with resources for learning bioinformatics at home.
  - Microbial ‘omics course material by the Meren Lab.
  - Common statistical tests are linear models (or: how to teach stats) by Jonas K. Lindeløv
  - The Biostar Handbook: 2nd Edition
  - SNP Filtering Tutorial
  - How to capture population structure with PCA? by Florian Privé.
  - Patterns of divergence and gene flow between populations and species by Simon Martin.
  - Orchestrating Single-Cell Analysis with Bioconductor
  - Fundamentals of Data Visualization by Claus O. Wilke
Bioinformatics help

Statistics, R and Python help: The SOS (statistics online for students) helpdesk is maintained by graduate students or senior undergraduate students with sufficient knowledge in statistics and statistical computing.

C3G has a very useful 'open door' bioinformatics consultation at https://www.computationalgenomics.ca/open-door/. All you have to do is sign up and you can have an hour with an expert bioinformatician helping you with whatever you’re struggling with.

Click here to access the

Good coding practices

- Check out Marco’s coding tips.
  - R
    - QCBS organises R workshops.
    - R cheatsheets
    - R markdown is great for writing reader-friendly scripts. If you’re new to R markdown, check out An introduction to R markdown and the R markdown cheat sheets.
  - Git & GitHub
    - Git and GitHub cheatsheets.
    - Barrett Lab GitHub page.
    - GitKraken.
  - Bash
    - Introduction to Bash by Marcus Sanatan.
    - Unix cheat sheets.
    - Explainshell is a neat tool for breaking down confusing commands. It also tells you exactly what each part does!
Outreach

The scientific community has a responsibility to communicate the importance of primary research to the public; unfortunately this is not always done effectively. As a result, we often fight an uphill battle against misconceptions and ignorance about basic scientific issues that we study. It is incumbent on scientists to make an effort to educate the public through outreach programs about the importance of our research for addressing basic and applied problems in science and society. To this end, I encourage members of the lab to make efforts to develop relationships with the communities where we conduct our fieldwork, and to contribute to science education through participation and organization of groups involved in public outreach. You can read about some of the fun initiatives Barrett lab members are engaged in here. If you are conducting outreach initiatives, please let me know so I can list them on the lab website!

You can find contact information about organizations and initiatives to get involved with here.

Social media

Social media is an increasingly important component of science outreach. If you would like to, you can share your own or any other relevant social media accounts here. In the future, I will have a general policy of not following student’s social media accounts unless they list them here or on their ‘mentoring plan’. I have no problem with any of you following my social media accounts.

Websites

I encourage everyone to create their own research website. This allows you to publicize your work and will give you more space to describe your research and activities than on the lab website. It also gives you the opportunity to develop your own “public persona” within the academic and wider community. And a website will be absolutely necessary if you wish to continue a career in academia (it is essential when interviewing for postdoctoral and faculty positions). When you have a website ready to share, please let me know so I can link to it from the lab website.

Peer-reviewing

Reviewing papers is an important skill that requires expertise, critical thinking and an ability to communicate constructive feedback in a fair way. Check out this guide to help you determine whether you should review a paper and to help with the writing process. Another useful source is AmNat’s Best Practices checklist for reviewers and authors.

Should you agree to review a paper?

1) Do you have the relevant expertise? You can critique a paper even if you are not an expert in all the areas of a paper, as long as you are open about which areas you have expertise in. You can focus on specific parts of the paper that you know well.
2) **Do you have the time?** Reviewing papers can be very time-consuming. Ask yourself whether you have the time to write a constructive review, do not say yes just due to obligation. If you agree to review a paper - do it well.

3) **Does the topic interest you?** Reading is usually the most time-consuming part, so if you’re going to read the paper anyway, writing a review will not require that much more time and effort.

4) **Is there a conflict of interest?** The editor is unlikely to be aware of potential conflicts of interest, so it is important that you assess this as objectively as possible. Sometimes, in very small specialist fields, people have to review each other’s work, even though they may know each other well.

**Suggestions for writing a review**

- Provide a short summary of the paper. Is it a good fit for the journal? Is the methodology appropriate? Suggest major and minor revisions and ways to improve the paper.

- Do not state what your ‘decision’ is, i.e. whether you think the paper should be rejected or accepted. Only do this if you are explicitly asked to do so. Sometimes when you submit your review you may be asked to tick a box about whether the paper should be accepted (e.g. accept without further revisions/reject with minor revisions/reject with major revisions etc). This is usually only visible to the editor, so the authors will not know your decision unless you specify it in the review.

- If a paper is rejected, it usually means that it will be bounced around to other journals. Most papers will eventually get published somewhere and you are unlikely to prevent something from being published (i.e. you are not the ‘gatekeeper’). However, by providing useful feedback during the peer-review process, you can influence the quality of papers that are published.

- One of the most helpful things you can provide in a review is comments on which parts are unclear. Authors tend to be blind to their own writing, so don’t be afraid to point out sections that are not obvious to the general reader.

- Be polite! The authors don’t know you, but the editor might remember you. Focus on the science in your review, not the authors.

- In general, it is safer not to sign your reviews. People are more likely to sign positive reviews, but there could potentially be a cost to signing if your comments are misinterpreted. Many people struggle to tolerate criticism and may take your comments personally which can lead to grudges being held against you. There is no harm in staying anonymous.

- Important to point out the positive things in the paper - do not just criticise everything. If you think the paper should be published, you need to defend it and point out to the editors why the paper is good.

- Make sure the data and analysis answer the questions the authors are asking. Whenever a choice is made in a study, check that the authors justify it (e.g. if they are splitting data sets, or choosing a specific type of analysis instead of another). Could the same results have been obtained due to another process than the one the authors suggest? When the writing is really good, you easily miss fundamental flaws.
● Outright acceptance of a manuscript is very rare.

● Check basic things: are sample sizes mentioned? Are the coordinates of field sites given? Is the referencing style consistent (and appropriate for the journal)?

● The harshest reviews often come from suggested reviewers. Keep this in mind when considering whether to request someone specific to review your work.

Reviewing scientific articles

Reviewing grants & awards

Professional development & future careers

Applying for postdocs

Detailed blog post on making a successful postdoc application. The blog post is related to this expired postdoc job in macroevolution, but it contains useful general advice.

- Professional development
  - Trainings as highly qualified students
    ○ Management
    ○Leaderships
    ○ Entrepreneurial mindset.
    ○ Philosophy and history
    ○ Presentation skills
    ○ Writing skills
    ○ CV
- Career future (https://www.nature.com/articles/d41586-019-02586-5)
  ○ Career prospect and current job market

Settling in Montreal

Finding accommodation

Shared apartments, lease transfers:
- Facebook groups, e.g. ite cède mon bail Montréal laval, International Roommates in Montreal
- kijiji

McGill Student Housing
Second hand furniture & more

- kijiji
- Renaissance Fripe-Prix
- Facebook groups, e.g. McGill University Free and For Sale (Textbooks + More)
- Eva B
- SSMU Marketplace

Healthcare

Getting a RAMQ card

International students

The McGill International Health Insurance Plan is mandatory for all international students. Please see instructions on how to activate your coverage.

International students can book an appointment in the McGill Health clinic. ALWAYS BRING YOUR MCGILL ID AND UP-TO-DATE INSURANCE CARD.

Pre-booked appointments for the following week are released on Wednesday mornings at 10am. You can book in person by going to one of the two kiosks located on the third floor of the Brown Building, or by phone (514-398-6017).

- Drop-ins are Monday to Friday starting at 8 am. Students can access the kiosk outside the Hub Reception area as of 7am, so it’s best to come early to get a drop-in spot.

For off-Campus care, most of these clinics will require you to pay cash up-front (you may be partially reimbursed by the insurance provider by submitting a claim afterwards).

If you are an international student and have the Medavie Blue Cross health insurance you can look for health professionals nearby using your address.

Hospitals

Making a claim

Vaccines

You can get vaccinated through your own physician, at a CLSC (Centre local de services communautaires), or at the Hub. Vaccines covered by the Quebec Immunization Program are available at the Hub. You can book an appointment with a nurse to learn about your eligibility and the availability of vaccines. If you have a prescription, you can purchase a vaccine at a pharmacy and then make an appointment at the Hub to have it administered there. Make sure you have instructions from the pharmacy on how to transport and store the vaccine(s) until your appointment.

Make sure you check what vaccines you need to get in good time before fieldwork, especially if you’re doing fieldwork in the tropics!
Out-of-state students

Quebec students

Staff

In Quebec, the public healthcare services are run by Regie de l'Assurance Maladie du Quebec (RAMQ). Foreign workers can qualify for subsidised healthcare under RAMQ, even if they are on a temporary work permit, provided they do not leave the province for more than 21 days at a time. If you will be absent for over 21 days, you need to contact RAMQ to obtain a Temporary Departure From Quebec form, fill it in and mail it. You can find more information on eligibility for health insurance during an absence from Quebec on the RAMQ website.

When arriving in Montreal, you need to register with RAMQ. You will need to pay for private health insurance for the first 3 months after arrival until you receive a RAMQ card in the mail. Some countries are exempt from the 3 month waiting period due to healthcare agreements with Quebec. These countries include Belgium, Denmark, Finland, France, Greece, Luxembourg, Norway, Portugal and Sweden. Whether you will be exempt depends on the nationality of the primary work permit holder (i.e. dependents from the countries listed above will not be exempt unless their partner is also from one of the exempt countries).

Prescription drugs are not covered by Quebec’s healthcare system. In addition to regular health insurance, every resident of Quebec is required to have prescription drug insurance. Usually you can choose between a private prescription drug insurance (usually arranged by employer) or a public prescription drug insurance through RAMQ.

The above information is adapted mainly from here.

Mental health services

Mental health problems are common in academia as well as the rest of life, and seeking help is important. Below are some resources if you feel that you need support, or you know somebody who is looking for help.

Keep.meSAFE is a counselling service that offers access to comprehensive mental health services to McGill students. They specialise in student mental health support and provide access to in-person counselling appointments in many different languages. All students pay $2.75/semester to access these services and there are no additional costs. Any McGill students can access the services, including undergraduate, graduate, Post-docs, continuing studies, and recent graduates (up to 6 months post-graduation).

If you feel like talking to someone, there is also a McGill Students’ Nightline run by student volunteers that offers a confidential, anonymous, and non-judgmental chatline and phone line. The Peer Support Centre at McGill also offers online zoom sessions during the pandemic by well-trained student peer supporters. You can make an appointment or drop-in during their service hours.
The McGill Student Wellness Hub is the place for holistic health and wellness needs. It provides access to basic physical and mental health services, as well as health promotion and peer support programs right on campus.

JED Foundation’s programs also has a helpline that you can call or text.

Transport

Metro
Opus card is a rechargeable travel card in Greater Montreal. Full-time students can get a reduced fare by applying for an Opus card with a photo. You need to renew your OPUS card by October 31 every year.

Car sharing
Communauto is a flexible and affordable car-sharing service in Montreal.

Cycling in Montreal

Bixi Bikes is a rental programme operating from April to November with automated pay stations around the city. You can pay with credit card or your OPUS card and it’s possible to get weekly, monthly or annual passes.

Where to buy a second-hand bike?
McGill bicycle repair co-op: https://theflat.wordpress.com/

Learning French

A good knowledge of French will help you integrate in Québec. The Quebec government offers a lot of affordable French courses for all levels. Depending on your status, these courses may be free of charge for you and you might even be eligible for financial compensation for learning French! You can check your eligibility and find available courses near you on Immigration Québec’s website.

If you want to learn French at McGill, check out the French Language Centre. In addition to offering French courses, they organise a variety of activities where you can practise your French, such as cultural outings and a cinema club. If you are interested in taking credit courses, French as a Second Language (FRSL) offers a variety of courses given throughout the year to students in any academic program.

If you don’t have time for a course and you just want to learn some basics, there are a multitude of online courses and language learning applications available for free.

Places to eat on campus

Map
Fitness & recreation

McGill has a gym, swimming pool and a running track close to the Redpath museum with affordable memberships. If you are looking for a private gym, EconoFitness is probably your cheapest option. They have lots of 24/7 locations in Montreal and flexible memberships. Most gyms in Montreal have student discounts, so always ask before you sign up.

Socializing and having fun in Montreal

MTL blog - events in Montreal

Music & Festivals

Festival de Films Francophones
Le Festival International de Jazz de Montréal