

Demystifying the Graduate School Application Process in Biology

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Target audience: Undergraduate Biomedical Sciences and Biology majors, transfer students, first generation graduate students and any prospective graduate students applying to graduate programs in Biological Sciences. Much of the information will hold true for both Masters of Science (MS) and Doctoral (PhD) students; we indicate when there might be a difference in advice based on the program of interest. The information presented here is a representation of graduate programs in the United States. However, advice may vary from university-to-university and may not be applicable to universities outside the United States.

Purpose: To demystify the graduate school application process by providing guidelines for prospective and current graduate students who might not know how to navigate the process of applying to graduate school and what to expect in a graduate program.

The bigger picture: This document is meant to help uncover hidden or unwritten curricula in STEM and make institutional knowledge about applying to graduate schools more accessible to everyone. This type of informal knowledge is often only communicated to those with the right networks or privilege, and thus reduces opportunities for other groups. You can read more about unwritten or hidden curricula [here](https://www.sciencemag.org/careers/2019/05/i-felt-lost-new-academic-culture-then-i-learned-about-hidden-curriculum).

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Glossary of Common Terms and Acronyms

Administrator - A professor who is not a member of the faculty, but may still teach classes or advise graduate students. They typically have an administrative position, such as a department chair, director, associate dean or dean. These individuals have a 12-month appointment.

Assistant Professor – A professor who is on track to get tenure, but who has not received tenure yet. Usually this type of faculty member is on an appointment that is 8-9 months.

Associate Professor – A professor who has received tenure at their university, but has not yet applied for or received a promotion to Full Professor. Usually this type of faculty member is on an appointment that is 8-9 months.

Full Professor – A professor who has achieved the highest faculty level at their university, by meeting a series of criteria required for promotion. Usually this type of faculty member is on an appointment that is 8-9 months.

Emeritus – A professor who has retired, and is no longer eligible to advise students. They may still have lab space, conduct research or serve on committees, depending on the terms they negotiated when they retired.

GAship or RAship – Graduate Assistantship or Research Assistantship – Funding support which is typically provided from a grant awarded to a faculty member, called the Principal Investigator. These funding sources can be used according to a detailed budget the faculty member submitted to the funding agency. Assistantships typically cover salary and tuition, but vary greatly depending on the award.

Graduate advisor – a faculty or staff member who advises graduate students about their degree requirements. This is not the same as faculty research adviser/PI.

Grant – funding from a governmental or private source that is obtained by a Principal Investigator. This faculty member is responsible for applying for grants and managing the grant budget if it is awarded so that the project objectives are completed within the award period. The grant is actually awarded to the university, but the Principal Investigator manages the grant.

Faculty research advisor – a faculty member who directs a research lab; interchangeable with the terms Principal Investigator (PI) or any level of active professor.

LOR - Letter of Recommendation

NIH – National Institutes of Health, a common funding source for academic scientists

NSF - National Science Foundation, a common funding source for academic scientists

PI - Principal Investigator - The director and lead researcher of an academic laboratory (a faculty member/professor).

Proposal - A document prepared by a Principal Investigator that describes the goals of a project and requests funding to conduct the project. Most proposals are subject to peer review by a panel of other scientists before funding decisions are made. Proposals are complex documents: they do not just

require the scientific plan, but also a detailed budget and documents justifying how the budget will be spent, as well as many other supplementary documents.

REU - Research Experiences for Undergraduates through an NSF funded program. This is a paid appointment for undergraduate students to gain research experiences in the summer.

Scientific Conference - An event where researchers and scientists get together to present and discuss their work. It is a good place to network with labs that you might potentially apply to for grad school, and a good place to learn about different programs and get information about fee waivers for applications. Many programs have booths where you can gather information and talk with representatives from that institution.

Stipend - A paycheck that you will receive bi-weekly, monthly, or bi-monthly etc. that is not based on the hours you spend on the work you are doing (it is like a salaried paycheck).

TAship – Teaching Assistantship - A competitive award that is typically available to doctoral students. At WMU, we offer competitive TAships to both Master of Science and doctoral students who have been admitted to the program. To the best of our ability and according to course needs, students are assigned teaching duties for courses in which they have research interest and/or strong knowledge based on previous coursework. Awarding of TAships is based on a complex number of variables, including the amount of funding the department is allocated from the university, the size of a faculty member's current research group and the strength of a student's application. At WMU, TAships pay an academic year stipend and up to 9 credits of tuition per semester. This will vary by university.

URM in STEM – Under-represented minority in Science, Technology, Engineering and Math. While this can include many under-represented groups, it is most often used to describe either women or racial/ethnic minority groups within a particular field of study.

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I. **Clearly define the area of research that interests you the most. How do you do this?**

- A. *Work with a faculty member to conduct undergraduate research.* If possible, get involved in research either at your university (at least a couple of quarters/semesters) or at a summer research internship that hopefully provides you with a stipend or other kind of funding. Yes, you can get all expenses covered AND get paid to do research during a summer program!
1. The best way to find a faculty research mentor at WMU is to take a class with them, impress them with your interest in their class and then reach out to them to ask about research opportunities. Faculty are typically looking for talented undergraduates to help out with research projects, so pay a visit to your instructor's office hours and ask them about their research. Even if you aren't taking a class with the faculty member, you can still ask about research. We love talking about our research, so your questions are always welcome! Here's how to contact all the faculty in WMU's Department of Biological Sciences:
www.wmich.edu/biology/research
 2. Be sure to take a look at the faculty member's research page (also in the above link) and read a bit about their research program before your meeting. You can also check out the faculty members' latest publications by searching for their name in Google Scholar.
 3. If you are a Lee Honors College student, you are eligible for a research scholarship through LHC.
<https://wmich.edu/honors/scholarships>
 4. Any students with a faculty research advisor are eligible for research awards offered through WMU's College of Arts and Sciences and WMU's Office of Research and Innovation. See the list here: <https://wmich.edu/arts-sciences/scholarships>
 5. Don't be afraid to ask professors or instructors about where to find opportunities beyond WMU. Make a plan to apply to these programs and to request LORs early. They want a diverse array of students and are not only looking for students with top grades and experience from well-known universities. The point of undergraduate research programs is to expose students to research.
 - i. These programs are often funded as "Research Experience for Undergraduates" (REU). The applications for such programs usually close in the fall or winter, so search for them the summer BEFORE you want to apply to them. Some programs prefer students doing their first REU over those with significant experience. Your institution or others in the area may offer workshops on applying for REUs or other undergraduate research programs. There may be discussions about it online on social media, blogs, or other services like Reddit. A list of NSF-funded REU programs is here: <https://www.nsf.gov/crssprgm/reu>
 - ii. Beyond REUs, there are other programs funded locally by universities or other entities (Cornell University has a nice list here: <https://biology.cornell.edu/research/summer>)

- iii. If you are at an undergraduate institution with a strong research focus, there are likely funding opportunities to do research, and get paid, at your university. They are often called SURF (Summer Undergraduate Research Fellowship) or something of that nature. You can always ask a faculty member, your undergraduate advisor, or the department chair about specific opportunities.
- iv. Some other **resources** are below, but this is not an exhaustive list.
 - The Ecological Society of America listserv “Ecolog”: <https://www.esa.org/membership/ecolog>
 - Evoldir: <https://evol.mcmaster.ca/evoldir.html>
 - American Physiological Society <https://www.physiology.org/ugsrf?SSO=Y>
 - Texas A&M University Dept. of Fisheries and Wildlife Sciences Job Board <https://wfscjobs.tamu.edu/job-board/>
 - American Society for Microbiology Undergraduate Fellowship <https://asm.org/Fellowships/Undergraduate-Research-Fellowship>

B. *Attend a Scientific Conference.* Attending a scientific conference in your area of interest can be a great way to network and to define your research interests. Ideally, attend a conference and present your undergraduate research as a poster, but the latter isn’t necessary. Many institutions offer funding support for students to attend conferences, and the conferences themselves often offer travel support. This is usually fairly easy to find on the conference website. If you engage in an REU program, there is usually funding built into that program to pay for your conference travel to share your research with the scientific community. Many scientific societies also have support systems for under-represented minority students in STEM. **For example, check out:**

- Ecological Society of America SEEDS program: <https://esa.org/seeds/>
- Annual Biomedical Research Conference for Minority Students (ABRCMS) <https://www.abrcms.org/>

II. **Build a Support Network – Who should be in your network?**

- A. *Ask for advice.* Build your network and ask faculty, TAs and grad students about grad school. You are encouraged to do this. Get more targeted information on certain topics. Don’t be afraid to ask whatever questions you have about graduate school and their research and teaching experiences. If you participate in a summer research experience, internship or job, ask your co-workers and advisers about their experiences. This will help you define your career goals.
- B. *Use Existing Programs.* There are numerous programs that have emerged to link students, particularly first generation (i.e., first in your family to go to college, and also pursue graduate education) and under-represented students, with mentors to help them find the right programs and apply to them. The mentors range from current PhD students who have gone through the application process recently, to tenured professors who understand the admissions process from the institutional side. **For example:** <https://eebmentormatch.com>

- C. *Social Media*. Twitter has emerged as a useful resource for sharing ideas and finding scientists in similar fields and role models and mentors who share your experiences and interests. Find professors whose research you like and follow them on Twitter or other media. This can also provide insight into their other interests and whether you will fit with them. If you have a specific question, you can post it and a network of people will hopefully respond.

Some of the many **groups and twitter** accounts that support under-represented minorities in STEM are:

- Black Ecologists Section of the Ecological Society of America <https://www.esa.org/blackecologists/>
- Society for the Advancement of Chicanos and Native American Scientists <https://www.sacnas.org/>
- ADVANCE Geo on Twitter @ADVANCEgeo
- Black Ecologists on Twitter @Becologists
- LGBTQ+ Scientists on Twitter @500QueerScientsts
- Women in Science on Twitter @500WomeninScience
- Black in Microbiology on Twitter @BlackInMicro

- D. *Get to know your professors and let them get to know you.* Build connections with professors early by going to office hours, asking and answering questions in class and asking for help or career advice. Take upper-level classes in areas that directly align with your research interests instead of just because they fit your schedule. You are more likely to get to know your professor well in these smaller upper-level classes. This helps you build a list of potential recommendation letter writers who actually know you, and are not just relying on your class performance. Involvement in research (discussed above) is the most effective way to get excellent letter writers on your side.
- E. *Get involved in volunteering on campus or in the community.* If you have the time and the means, try to build connections across campus and in your community through volunteerism that reflects your career goals. For example, if you are interested in a career in ecology, spend some time volunteering with local environmental or land conservancy groups. The connections you make beyond your department broaden your network and help you define your interests.

III. Apply to graduate programs.

- A. The only way for one to absolutely ensure you won't get into a program is to not apply. Do not self-select against yourself beforehand by failing to apply!
1. Don't let your GRE scores or GPA hold you back from applying. While some programs live and die by these scores, most programs consider your research potential and your connection to a faculty research advisor to be the most important factor for admission.
 2. Many programs are moving away from requiring GRE scores completely.
 3. While your GPA is one indicator of academic success, so is the trajectory of your grades over the course of your undergraduate career. Many students, particularly those who are first generation and URM, struggle in their first year of college but then improve over time. The letters of recommendation you request can help address this if it is an issue.

IV. Finding and contacting prospective faculty advisors for your graduate research

- A. *Programs differ from university-to-university and by field.* Finding a faculty research advisor is an important step for research-based graduate programs (MS and PhD) and for the future of your career. Graduate programs have an official application to the program which you submit through the university, but many graduate programs will only accept students if a professor has agreed to accept or interview them. Other programs may accept students and then match them to faculty research advisors in their first or second year, through rotations or other means. You need to figure out the type of program to which you are applying. But for either type of program, it is essential to make connections with faculty advisors before you submit your application.

1. In WMU's Department of Biological Sciences, we require you to have sought out a faculty research advisor who is committed to mentoring you during your entire graduate program or for your first semester rotation. Finding and contacting an advisor is up to the applicant. You can find a list of faculty members and their areas of research interest here:
www.wmich.edu/biology/research
 - i. *Why do we have this requirement?* Coming into a graduate program with a faculty research advisor sets you up for success. By beginning your graduate school career with a faculty member who is invested in your success, and the support of a research lab group, you set yourself up to begin a focused and meaningful research experience.
 - ii. Ideally your faculty research advisor is going to introduce you to a network of scientists and professionals with whom you will interact for your entire career.
 - iii. Completing a graduate program in Biological Sciences requires you to conduct field research, laboratory research or both. Your ability to succeed depends upon your faculty research advisor's ability to fund your research activities. While your stipend and your credits may be covered by a competitive teaching assistantship, the costs of your research are typically covered by your faculty research advisor from a grant budget.
 - iv. In addition to funding, your faculty research advisor will also be committing a significant amount of time and energy toward mentoring you during your graduate program. It is important to know whether a faculty member is able to commit to taking a new student before you apply. If a faculty member is close to retirement or has an administrative appointment, they may not be taking any new students at all.
 - v. Finally, it is important to find a faculty research advisor who is going to be a good mentor for you. Everyone is different, and not all advisor/advisee relationships work well. It is important to get as much information about whether you will have a productive working relationship before you accept admission.
- B. *How do you find a faculty research advisor?* Start by learning more about what research you are interested in and what others are doing, with the goal of finding a pool of people doing work in your area of greatest interest. "Doing your homework" in this way is essential to focusing your topic areas and reflecting on what you want to do. Some great ways to start are:
 1. Read scientific papers about research that interests you. Find the principal investigator (PI) or the corresponding author on these papers. Create a spreadsheet with researchers' names and their university affiliation, as well as keywords relating to their research and your interest.
 2. If you are able, attend scientific conferences and go to talks and posters in areas that interest you. Again, list their names, affiliations and key words and try to meet with them at the conference.

3. Ask faculty or senior scientists at your own institution about researchers in the field in which you are interested. Chances are they can provide you with a few names to check into.
 4. Once you have a list, look at the lab websites of faculty principal investigators to read more about their work and their lab groups. Look for things like: How many graduate students do they have? Have they published recently and on a regular basis? Do they mention a big grant that was just awarded? If they have a Twitter feed, follow the professor on Twitter.
 5. Reflect on your personal constraints (e.g. geographic) to narrow down the list.
 6. Once you find a lab that interests you, see if there is a page on their website for prospective students. If so, follow the directions for reaching out, and use the information there to craft your email. If not, feel free to email the faculty member directly for more information.
- C. *When should you start emailing prospective faculty research advisors?* Ideally you will contact potential advisors several months before you submit an application. If applications are due in December, generally you should contact prospective research advisors by September. However, reach out to potential advisors as soon as you can articulate your interests. If it's a long time before applications, you might be able to meet up with the advisor at a conference or at their university. But, if it's after you've submitted an application, it's also not too late to reach out to prospective faculty advisors, especially for programs that follow a first-year rotation model.
1. In WMU's Department of Biological Sciences, the deadline for applications to the MS and PhD programs is February 1 annually. If admitted, you can begin your graduate program as early as Summer I (May), but most students begin the following Fall semester. We recommend you start contacting prospective faculty advisors in September/October. Please see these websites for all the details on application requirements:
 - MS Program: <https://wmich.edu/biology/academics/master-sciences>
 - PhD Program: <https://wmich.edu/biology/academics/doctorate>
- D. *What should you say in your first email to a prospective faculty advisor?* It's important to spend time writing this email because it can make a good first impression and catch an advisor's eye. You will need to state your research interests and how your experiences drive your interest in this particular laboratory, so it is important to understand the lab's research by reading the website and publications. The ability to articulate why you are interested in a certain research topic (theme or paper) in your own words – what you find exciting, how you came to be interested in that through past work experience, why it's important – is critical. The length should be one paragraph or at most two short paragraphs. Things to include:
1. Any research experience you have. If you don't have research experience, other work experience can be mentioned if you can connect it to why you're interested in the lab. Connecting your past experience with your future goals in your lab of interest is essential.

2. Your timeline – for instance, “I am applying to graduate programs this winter for anticipated start in September 2022”
 3. If you have some professional connection to the professor, mention this. This is NOT required but as humans we look for personal connection and if you have one, it can help the person notice your email and give you peer-credibility.
 4. If you will be attending a conference in a relevant field sometime soon, mention this. It is a great place to meet potential advisors and (if applicable) for them to see your research presentation!
 5. Get to these two questions:
 - i. **Are they accepting students for the semester that you wish to start?**
 - ii. **Would they be interested in talking with you further about shared research interests?**
 6. Attach your resume or CV.
 7. Things to avoid in this email are:
 - i. Copying and pasting phrases from the professor’s website or publications (but do read these)
 - ii. Using the same exact email and sending it to multiple professors (it won’t be very strong).
 - iii. Weird formatting, like multiple fonts, or unprofessional and overly flowery language
 - iv. Typos or mistakes like including the wrong professor’s name. Proofread.
 - v. Overly flowery or complimentary language about the professor, university or area of research. Keep it simple.
- E. *If you don’t hear back, should you follow up?* If you have not gotten a response, you are encouraged to email the advisor again in a few weeks. After a second email, assume they are not taking students, and drop it or try make contact another way (e.g. attend a talk at a conference) if possible. Move on to other names on your list of prospective faculty research advisers.
1. As for what to say in a 'follow-up': we recommend re-sending your first email, adding to the top something like: "*Hi Dr. __, I wanted to make sure you saw my email. Could you please let me know if you are taking graduate students this year?*" or "*I know you are busy, but wanted to reach out one more time...*" It might just have trickled down in their inbox, especially if you emailed at the beginning of a semester. The faculty we surveyed said if this ‘re-mail’ came a couple weeks after the first, they would not consider this pushy at all. In some cases, faculty even wait for repeated emails before they consider a student.
- F. *How many prospective advisors should I contact?* There’s no rule on this, but we suggest you develop a list of 8-10 labs (likely at as many universities) in your field of interest that could be good fits, and contact them by the end of September.

1. If you find that you have more than this amount of labs, or that the focus areas of these groups varies widely, you probably need to focus your research interests more.
 2. Do not get discouraged if some faculty never reply. A good goal might be to have three potential advisors who are willing to take you on as a student by the time you apply. You only need one to get in, but it's nice to have choices.
- G. *What if you are applying to international programs?* These tips apply to many PIs in the US. Many similar concepts apply to contacting anyone, but you may want to ask around for country-specific conventions if for schools outside the US.

Here are two examples of good emails from prospective students.

Note that customizing a letter to your own voice and interests is essential. See info above.

Example 1:

Dear Dr. Evans,

I am a senior Biology Major at Villanova University and I am interested in learning more about your research group at Michigan State University. I am writing to inquire whether you are taking new students for the Fall 2021 semester? I was intrigued by your recent paper, "Climate change alters ecological strategies of soil bacteria". The conclusion that of the 127 species found in both the ambient and delayed rainfall regimes, only 18% did not show changes in strategy, was profound in regards to the impacts of historical conditions on microbial communities. The question you pose at the end regarding the unclear distinction between alterations in ecological properties, being due to shifts in species composition or strategy, aligns with the types of questions I would look to pursue under your advisement.

This year I am working on a senior thesis project under the advisement of Dr. Samantha Chapman. Using a warming and snow removal experiment, I am addressing the question: will variable soil temperatures affect enzyme activity involved in P, N, C, and cation cycling in a Pennsylvania deciduous forest. While performing this research I found I was particularly interested in the mechanistic aspects of soil ecology and would be interested in exploring related questions in a starkly contrasted environment such as the Namib Desert.

I greatly appreciate your time during this busy time of year and hope to hear back from you soon.

Example 2:

Hi Dr. Docherty,

My name is XXXX and I recently graduated from Michigan State University with a BS in Microbiology. I have almost 3 years of research experience working in Dr. XXXX XXXXi's lab at MSU in conjunction with Dr. XXXX XXXX's lab. My project has been to characterize a novel bacterial species isolated from water filled tree hole sediment. The attached CV details the experience I have gained working with microbes. I have worked with microbes under a variety of conditions, with expertise in anaerobic technique through Dr. XXXX's lab. Data analysis and figure generation through my project has allowed me to gain a basic understanding of R. Since graduating, I have been working as a Chemist for XXXXX, a Biotechnology company in Lansing Michigan, where I work with food-borne pathogens and mycotoxins

I am interested in your work with microbes that can survive in the air and atmosphere microbiome. I read about this phenomenon with Pseudomonas syringae with the freezing water in clouds and being identified in rain, snow and water samples from clouds, and investigated your work studying airborne microbial distribution at a continental scale. I am considering possible research labs for continuing my graduate studies and I'm wondering if have any openings in your group and if you would be willing to talk with me further? Please let me know if there would be a possible opening for graduate studies for Fall 2020.

I look forward to hearing from you and discussing the on-going research in your lab!

Here are some other resources to get a variety of perspectives on how to write this email:

- <https://contemplativemammoth.com/2013/04/08/so-you-want-to-go-to-grad-school-nail-the-inquiry-email/>
- <https://sites.google.com/view/apply-academic-positions/graduate-student>
- <https://www.sciencemag.org/careers/2015/05/dear-dr-neufeld>

V. Letters of recommendation for your graduate application

- A. *Know the application deadlines and create a plan for when tasks need to be completed.* While criteria vary from university to university, for each application you submit, you will need to send an official transcript, a personal statement, a resume and ~3 LORs. There is usually an application fee. Depending on the program, you may also need to submit official GRE scores, so you will also have to take the GRE well ahead of the application deadline. In most cases, if any of these application materials is incomplete by the deadline, the application is automatically rejected.
- B. *How do I get LORs that strengthen my application?* LORs are critical for the admission process and they can make or break your application. Getting a great LOR often requires a semester, year or more to lay the groundwork. Here are some tips:

1. When applying to graduate programs, you should try to get at least two letters from references who are in an academic setting.
2. Request LORs from your references well in advance of the deadline for your application. Ideally request them a month before the deadline, though typically 2 weeks is the minimum amount of time that is considered acceptable. Communicate a hard deadline for submitting the letter, but make this about one week before it's actually due. This will help ensure your letters are submitted on time and that your application will not be rejected because of a missing LOR.
3. Tell your letter writer your objective (e.g. apply to a Master's program in XX field) and include your resume and personal statement when you request a letter.
4. Tell your letter writer why you are specifically asking *them* for a letter. (e.g., they may have read a lot of your writing in a class and can comment on your written communication skills, you may have visited their office hours numerous times, etc.)
5. You can offer to meet with your letter writer to talk about your career goals, or you can even offer to draft a letter for them to edit.
6. Always ask whether your letter-writer thinks they can write you a strong letter to support your application. It is part of a faculty member's job to write honest letters of recommendation.
7. Be very clear about the programs to which you are applying. Some programs may allow you to use a letter service (e.g., Interfolio) to send a common letter to all of the programs to which you are applying. But, this may not be the case for more ecologically/evolutionary focused graduate programs, which likely require direct letter submission from the letter writers. Thus, give your writers a spreadsheet with a list of the programs, deadlines, links to departmental websites about the program, and links where the letters are to be submitted. This will save a lot of time down the road as deadlines approach.
8. Check in with your letter writers to remind them of the deadline a few days before. Ideally your letter writers will send you a confirmation when they send your letter or you will receive an automated reply from the program to which you are applying with a confirmation of receipt.
9. Whether you are accepted or rejected, communicate this with your letter writers. If they wrote you a letter then they are invested in your success and would like to know where you end up. Rejection is a common part of academia. You should also communicate rejections with them, especially if you want future letters from those writers. Keep them in the loop as to whether you may be asking them for more letters in the future.
10. Always thank your letter writers for submitting letters on your behalf.

C. Who will write letters that will **support** you application?

Ideally, at least two letters from any of the following:

1. The best person to write you a letter is an undergraduate faculty research advisor. Ideally you have worked with this faculty member for a year or more and they know you well enough to write you a strong letter with lots of personal details about your careers goals, your work ethic and your understanding of the nature of science.
2. If you worked on a research project but interacted more with a graduate student or postdoctoral researcher instead of a faculty member, these are also great people to ask for a letter. Again, they should know you well enough to write you a strong letter with lots of personal details.
3. A faculty member with whom you took an upper-level course, or a course with fewer than 20 people. Faculty usually offer upper-level classes in their field of expertise, and these classes often involve more communication between students and faculty than entry-level courses. Instructors of these courses have a good idea of your communication and writing skills, work ethic and personality.
4. A faculty member with whom you took any level course and who you visited often during their office hours to ask questions and get help (but not to complain about their grading scheme or their instruction style).
5. A teaching assistant. While you may not have gotten to know the faculty member, particularly in a large undergraduate class, you likely had many small-group interactions with your TAs.
6. Faculty members or grad students who served on your committee for an undergraduate thesis. At WMU, there are typically 2-3 committee members who read your LHC thesis and attend your defense. These committee members can certainly comment on your written and oral communication skills.

If appropriate, one letter from any of the following:

7. A supervisor at your job. If you worked at a job in your field of interest, then your supervisor is a great resource as a letter-writer. If your job is not related to your field of interest, a boss can still comment on your time management skills, work ethic and attention to detail.
8. A coordinator of a volunteer group or internship program. This is particularly helpful if your volunteer activity is related to your field of interest, but as with your supervisor, they can comment on a number of other qualities about you.
9. An athletic coach. Typically collegiate student athletes demonstrate amazing time management, team communication skills and goal-orientation. Your coach or assistant coach should be able to comment on these attributes to write your LOR.

D. Who should I avoid asking for a LOR?

1. Peers. Don't ask someone who is on the same level as you. Examples include: another undergraduate researcher in your lab, a co-worker, a teammate, etc.
2. Family and friends. These people have a conflict of interest with you and should not write your LORs.
3. A faculty member or TA who says that they didn't get to know you well enough to write you a strong letter, but that they could provide you with a form letter.
4. A faculty member or TA who says they don't think they can write you a strong letter to support your application.

VI. Personal statements and resumes

- A. **Personal Statements** – A personal statement should reflect your reason for wanting to attend a M.S. or PhD program. Personal statements vary widely, but usually a 2-page personal statement is sufficient, unless otherwise stated in the application instructions.
1. Describe your experience that has led you to apply to an MS and PhD program. This may be based on your undergraduate research, classroom or work experiences.
 2. Describe your career goals after completing this program. Think about why you need *this* degree to accomplish these goals.
 3. Describe why this *particular* program is a good fit for you. Ideally you should explain here why the faculty research adviser with whom you would like to work does research that aligns with your career goals.
- B. **Resumes** – At this stage in your career your resume should fit on one side of one page, unless otherwise stated in the application instructions. If you google “college student resume example” you will find many great examples and templates online.
1. Only include the most important information on your resume.
 - i. Name, contact info
 - ii. Education: Your college, major and GPA.
 - iii. Research Experience: (If available – discuss research accomplishments, awards, presentations, skills learned. Mention your undergraduate research advisor by name.)
 - iv. Work Experience: (If available – discuss skills learned, especially for jobs that were relevant to this field)

- v. Most relevant coursework: List classes and skills that you took as an undergraduate that provided you with experience that prepared you for graduate school in this field
- vi. A list of your references/letter writers and their affiliations

VII. What to expect after you apply

- A. Once your application is submitted, it will be checked for completion. Depending on the program, you may or may not receive any information on whether your application is complete. There is usually an automated application portal where you can check your application status online. You can always check with the program or department to which you have applied if you are concerned. See the program website for the appropriate contact person.
- B. Completed applications will be reviewed by a committee. This is usually a group of faculty members. It takes a lot of time to review these applications and make admissions decisions, so it is reasonable that you may not hear back about your application for at least a month or more.
 - 1. While it's fine to email the department graduate admissions coordinator or administrative assistant to ask about the timing of the review process, it is not appropriate to email immediately after you have submitted your application to ask if you have been admitted.
- C. Visit the campus and meet with prospective faculty advisors. This is VERY important, but how it is accomplished varies widely by program. Below are some things you might experience.
 - 1. Some graduate programs have all-expenses-paid recruitment and interview weekends where students are brought in to meet each other and to interview with prospective faculty research advisors. If you are invited to one of these events, you should absolutely go. Attending these events are typically a requirement for admission. These are interview weekends, and they will be jam-packed with activities. It is an opportunity to meet the cohort of incoming graduate students, as well as current grad students and faculty. You also might be interviewing alongside other prospective students who are directly competing with you for a position.
 - 2. Some graduate programs do not hold official interview weekends, but individual faculty may bring prospective students to campus for a day to interview. While optional, typically faculty will pay something toward travel or housing for you to come and interview so that you don't have to cover those costs. In this instance, your prospective faculty advisor will probably create a schedule for you so you can meet with their current graduate students, other faculty who might serve as your committee members and to get a tour of the facilities. If this isn't offered, you should certainly request it.
 - 3. In some cases you may not be invited to interview in person, but you can request to come to campus and visit to talk with your prospective faculty research advisor and their lab group. Again, you may not be offered a schedule to meet with grad students, other faculty in the department or see the facilities, but you can certainly request it.

4. In some cases it may not be possible for you to visit campus. If that is the case, then your prospective faculty advisor may request a virtual interview to talk with you. You should also request to speak with their graduate students. If it's possible to get a virtual tour of the lab, that might be useful as well.
5. Every graduate program differs. Some graduate programs, particularly those that are very focused on molecular biology, do not follow a model of interviewing students. Rather, they admit a pool of students who are then assigned to labs where they do rotations. Rotations are a short period of time that a student spends in a research lab to get a feel for the faculty advisor, lab culture and research topic. Even in this instance, it is still worthwhile to try to visit campus and meet with some of the faculty and graduate students in the program before committing to attending.

VIII. How to get the most information you can from a campus visit

- A. The campus visit (or a virtual interview) is an important step that can help you make your decision about whether you want to attend a graduate program. It is also an important time for the faculty research advisor to see if you will be a good fit for the research program they have built. Here are some things you should do:
 1. Get advice from your undergraduate network about how to shine on an interview. Ask them to help you prepare by doing a practice interview.
 2. The biggest question you should ask during your email or phone conversations with your prospective faculty advisor and during your interview is about funding. You are encouraged to ask about this.
 3. Most MS and PhD students in STEM fields receive a stipend and tuition for the entirety of their graduate program. Funding for graduate students can come from teaching assistantships (TA), research assistantships (RA), or other fellowships either inside or outside the university (e.g. NSF GRFP). Ask what funding the advisor has available, or other opportunities for funding, and what your grad experience would look like (e.g. are TAships widely available or guaranteed? Are any RAships available?)
 - i. In WMU's Department of Biological Sciences, most MS and PhD students are funded by competitive teaching assistantships. You will apply for a teaching assistantship after you have been admitted to the program (usually late February). These cover academic year (Fall and Spring) stipend and up to 9 credits of academic year tuition.
 - ii. Teaching assistantships are available for up to three years for MS students and up to five years for PhD students.
 - iii. In many cases, graduate student stipend and tuition can be covered by a research assistantship on their faculty research advisor's active grant.
 4. Come to the interview prepared with lots of questions. Take some time to write down a list of questions before your interview. The faculty research advisor may not know all of

this information, but if you have an opportunity to meet with the Graduate Advisor, the Department Chairperson and graduate students, some of these are good questions for them. Certainly ask the same question of multiple people so that you gain a variety of perspectives.

You should be prepared to ask questions about:

- i. The research that your prospective faculty research advisor does. Read some of their papers to get a bit of background on their current work
 - ii. Ask if the faculty research advisor has a written graduate expectations document that they can share with you. If not, ask them about their general expectations
 - iii. Find out about all the program requirements and teaching requirements
 - iv. Ask about the research culture in the department, research and technology support
 - v. What grants your faculty advisor has funded currently or has in review. What are their most common funding sources?
 - vi. Certainly ask about how/whether your stipend will be supported and also ask about health insurance. Ask about support systems for students who are URMs in STEM. This might include offices that support students with disabilities or veterans and registered student organizations that support a variety of minority groups,
 - vii. Ask your prospective faculty advisor about their mentoring style, their greatest successes and failures with graduate advising, their thoughts on advising students from different backgrounds and with different career goals.
 - viii. Ask how the faculty advisor makes their lab an inclusive environment for diverse scientists-in-training.
 - ix. Ask if they provide guidance on teaching effectiveness and opportunities for mentoring undergraduates.
 - x. Ask about support for travel to professional conferences and financial support.
5. Ask to talk to current and past graduate students who have worked with your prospective faculty research advisor. Try to talk with them in private, either with a follow-up call or during your visit. Ask them their honest opinions about all the things listed above in part 1. Gauge whether they are happy and productive in this environment.
 6. Ask for a tour of the facilities and of campus. Faculty or graduate students are usually more than willing to show you around so you get a feel for the campus environment.
- B. Come to the interview prepared to answer questions about yourself. The faculty that interview you are usually kind and considerate. Usually they want to get to know you and aren't trying to discourage you from coming. They invited you to the interview for a reason, and already are interested in you. Anyone who isn't kind to you during the interview is not within the majority, but pay attention to this because bad behavior may be a red flag about that program.

Here are 10 common questions:

1. "Tell me about yourself" ...
2. "Why are you interested in this field?" ...

3. "Why are you interested in our school?" ...
 4. "What are you going to research?" ...
 5. "What are your strengths and weaknesses?" ...
 6. "Why should we accept you?" ...
 7. "What are your career goals?"
 8. "To what other schools are you applying?"
 9. "What interesting papers or media have you read recently?"
 10. "What questions do you have for me?" - This last question can be loaded, especially if the interviewer expects you to be familiar with their research. You may not even get the list of people you are interviewing with until a few days before the interview, so even something as simple as checking out their website and jotting down a few notes may go a long way.
- C. Keep your eyes and ears open for indicators that this is a good environment and for red flags.
1. It is a good sign if:
 - i. Faculty are able to answer all your to your satisfaction
 - ii. Faculty seem busy, but motivated and happy
 - iii. Graduate students seem well-supported and can give examples about why they feel supported and have work-life balance
 - iv. Graduate student are graduating in a timely manner (3 years for Masters, 5-7 years for PhD)
 - v. Graduate students say their faculty advisor supports diverse career choices
 - vi. Graduate students are productive – writing papers, attending conferences
 2. It is a bad sign if:
 - i. Graduate students seem to struggle to find stipend support or are paying for their own tuition or research supplies out of pocket
 - ii. Graduate students are taking a long time to finish or graduate, or many graduate students have dropped out
 - iii. Faculty seem to lack leadership skills or are too stressed to mentor effectively
 - iv. Faculty push their graduate students to ignore work-life balance
 - v. Faculty are largely absent from their graduate students lives
- D. Some advice about behavior during on-campus interviews
1. Don't treat the interview like a vacation or opportunity to over-indulge or to let loose. Treat the entire time as an informal interview, even when you are socializing with peers. It is important to remain professional throughout the event. One should be themselves and be genuine, but behavior matters.
 2. If there is alcohol offered at an event, it is appropriate to have some if you want (and to say no if you don't), but do not over consume it. One of the surest ways to lead to detrimental outcomes is to get drunk and not behave in a thoughtful manner.

3. Recruitment events are not courtship events. Don't hit on fellow recruits or current graduate students. They are social events, so of course you may make new friends, share contacts, etc., but avoid romantic endeavors during the event. This recommendation works both ways: current faculty and students at the institution should not make advances towards recruits, either. If any advance or discriminatory statement is made from a university employee at a recruitment event, you should take that as a red flag about the institution and consider reporting it as a Title IX violation.
4. Don't be condescending or rude to the graduate student or undergraduate students you meet on an interview visit. Even if they aren't in your prospective lab or department, they have worked hard to get to where they are, just like you are working hard to attend graduate school.

IX. Admission decisions and next steps

After applying and/or interviewing, you will receive information about whether you have been admitted to the program.

A. Rejected

1. If you get a rejection letter, don't take it personally! Rejection is part of life as a scientist. There are many reasons why you might not be admitted to a program. Sometimes this will be stated in the rejection letter, but more likely you will just receive a form rejection letter. Certainly you should try again in the future. Here are some common reasons:
 - i. It was a requirement of the program that you identify a faculty research advisor with whom you would work, but you didn't build a strong connection with that faculty member. It is on you to initiate conversations with faculty members and demonstrate your interest in their research program.
 - ii. Funding for a TAship or from a grant did not come through for the faculty research advisor, due to a number of factors that are completely beyond your control.
 - iii. You were competing with a few other applicants for a spot in a lab and you weren't the strongest candidate.
 - iv. You didn't meet some criterion required by the program. Typically you would not be invited for an interview if this was the case, but for programs that do not have an interview process, this could be a reason for rejection.
 - v. Something didn't go well in your interview which raised some red flags.
 - vi. You didn't convey why you had a clear interest in the research program when you were talking one-on-one. Your interest was too vague for the faculty research advisor to be confident that you are ready for a long-term commitment required for a Master's or doctoral degree.
2. If you do receive a rejection letter that doesn't state why you were not admitted, it is fine to (politely) follow up with the faculty member with whom you interviewed or the person in charge of graduate admissions for the department. They may be able to give you some advice to improve your application or interview skills for another round of applications.

B. Admitted

1. If you are admitted to a graduate program – CONGRATULATIONS! This is a competitive process and you should be proud of this accomplishment.
2. For some programs admission guarantees funding. For other programs admission is just the first step to funding, and then you need to apply for a teaching assistantship or graduate assistantship. Make sure you know what the process is for your program.
3. Ideally you will be admitted to a few different programs and you will have choices. Choose the program that will give you the most financial and emotional support, that will provide you with an opportunity to do excellent science and work with a faculty research advisor with whom you felt a good personal connection.
4. Don't feel pressured to go to a lab or university that doesn't feel like the right fit, even if it is a prestigious program.
5. You will usually be given some time to choose a graduate program, but there will be a deadline. At a minimum, graduate programs in the United States are required to give you until **April 15** to make a decision. They cannot force you to make a decision before then, but the earlier you can respond the easier it will be for the program and faculty adviser to make financial decisions. Make follow-up phone calls with the faculty research advisor and graduate students to ask any lingering questions that will help you make your decision.
6. You may have the option to start your graduate program early, in the summer. For ecologists this is particularly important because it allows you to complete a field season the summer before your program. Ask if this is an option.
7. Graduate students are not typically provided with moving expenses. You should certainly reach out to the graduate students you met for advice on housing in the area.

C. Admitted to multiple programs – writing a declination email

1. If you are admitted to multiple programs, you will need to decline all but one of them. These decisions can be tough, so ask for advice from your network as you make this decision.
2. Once you've made your decision, you will need to decline an offer of admission in a timely fashion. You should send an email to the faculty research adviser with whom you have been communicating with as well as the person who handles graduate admissions.
3. This email should be thoughtful. The world of scientific research is very small, so you do not want to burn any bridges. It should include:
 - i. Thanking them again for hosting a visit/virtual interview and answering your questions. Explaining that this was a tough decision, and you thought deeply about it.

- ii. Expressing that you are very interested in their research program and hope that we can continue to interact in the future.
- iii. State that you interviewed several places and you felt that XXX's lab at XXX university was a better fit for you at this point in your career. You don't need to explain why, but unfortunately you need to decline their offer of admission.
- iv. State again that you hope to continue interactions with this faculty member in the future, at conferences and possibly for future postdoctoral appointments.

We truly hope this document is a valuable resource that explains the complex and often invisible process of applying to graduate programs in Biological Sciences.

Please contact bios-gradadmissions@wmich.edu with questions about the graduate programs in the Department of Biological Sciences at WMU