

2022

Securing an Undergraduate Research Position

ADVICE FROM A FELLOW UNDERGRADUATE RESEARCHER
ANDREW D'ELIA
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Prelude:

Seeking a research placement with a supervisor can be difficult, intimidating, frustrating... the list goes on. I am not here to tell you that there is some secret formula that will guarantee you the placement you desire or research award you are going after. What I can do, however, is provide you with some genuine insights on how I secured my own (undergraduate) research placements, and pass on some advice I wish I received when I began my research journey. Of course, I cannot guarantee that these strategies are the best ones out there—or that they will work for you—but I have had great success with them, and I hope you might too.

This document seeks to provide students looking to enter the research world with some valuable insights on what research is like and how they can get their foot in the door. As an undergrad with absolutely no experience or connections to research, I found it difficult to establish my place in research and identify sources of opportunity. I wrote this document because I feel that every student should have equal opportunity to experiences in research. One's social capital, or lack thereof, should not stand in the way of them discovering their full research potential.

Of course, this document is the product of my own experiences in research and may not reflect the experiences or findings of others. If there is an approach you have found success with that differs from the contents of this document, please feel free to reach out to me with your feedback! I would be happy to cut, add, and revise based on your experiences.

Best of luck in your research endeavours!

Andrew D'Elia, B.A.Sc. (Biomedical and Materials Engineering)
MD Student, University of Toronto

PS: Reach out at any time! You can contact me via email (andrew.delia@mail.utoronto.ca) or connect with me on LinkedIn (<https://www.linkedin.com/in/andrewdelia>)!

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Finding Professors That Interest You

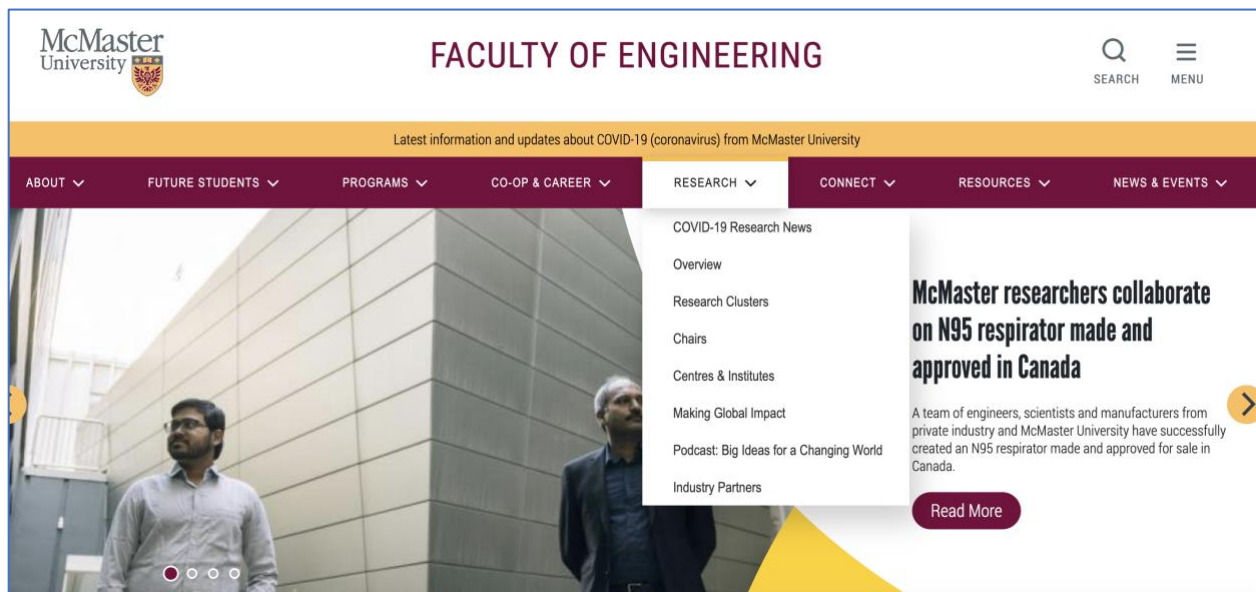
Of course, the first step is to find a professor you are interested in working with. Better yet, find several professors you are interested in working with. As with any job, there are going to be applications that you don't hear back from, positions that are already filled, and yes—those that work out! As such, it is important to have a few professors that you want to work with in mind to increase your odds of landing a job in one of their labs. Five to seven potential leads is a good number to start out with. I'll begin by listing some places you can use to find professors whose research you might enjoy, and then provide some additional things that you may want to keep in mind before you reach out. Best not be too picky, but if there is a specific work environment, type of research, or position you want, these may be important to prioritize! Remember that as with any other job, research positions are a mutual opportunity for you and your new lab to progress—as such, it is important that you feel you are getting something meaningful out of the experience.

Starting Your Search

One of the best and easiest places to find a principal investigator (PI, i.e., a research supervisor) is at a university. Universities often feature a research section on their websites that can help you to find and profile supervisors you may be interested in working with. Some are, admittedly, more organized and user friendly to navigate than others... so bear that in mind as you conduct your search!

Start with the faculty you may want to work under: is it Engineering? Math? Science? Medicine? The faculty you choose will cast a rather wide net on the type of investigators you want to work with and what their research might entail. Keep in mind that some schools have niche faculties and/or divisions that might not exist at other universities. For example, the University of Toronto has a Faculty of Medicine and a Faculty of Pharmacy, while McMaster University only has the former, not the latter. Certain universities will also have smaller “centre for's” and “institutes of's” that further specify the research they specialize in, so look out for those when browsing their websites. For the purposes of remaining succinct, I will not go into detail about private research companies. At McMaster, the Faculty of Engineering organizes their PI's rather well. From the general Faculty of Engineering website, you can find professors

from a range of research specialties, even if they belong to a “centre for” or “institute of”—so long as they hold an appointment within the faculty. Head to the research cluster tab and narrow your search by selecting the general field of engineering you are interested in. Sift through headshots with brief research goals to find professors that catch your attention, then click on them to expand their profile, look at past publications, and explore their website (if they have one). If you aren’t interested in engineering research, not to worry—you can find a similar setup on almost any faculty website.



Undergraduate Research Programs

Sometimes, faculties will offer “undergraduate research programs” that usually take place in the summer. I like to call these the hidden gems of undergrad research... *Gems* because they tend to make finding a research opportunity 5x easier, and *hidden* because, well, to put it bluntly, most faculties do a very poor job of advertising them to students. These programs will often take on several permutations of the same name. For example “Summer Research Opportunity Program (SROP)”, “Undergraduate Summer Research Program (USRP)”, “Summer Undergraduate Research Program (SURP)”, etc. These programs will sometimes feature faculty members or project lists that are available for the upcoming summer, so it is a great place to look for a supervisor or project that is looking for undergraduate support. They will also tend to provide more insight on *how* to approach potential supervisors and secure a research placement. For example, some programs will ask that you reach out to









professors on your own and arrange an application together, while other programs will ask that you apply through their platform and rank your project/supervisor preferences... Finding this information from the get-go can save you a lot of time and frustration. How do you find them you ask? Simply type the name of the institution you are interested in + the words “[summer] research program”(e.g., “*Institute of Medical Sciences Summer Research Program*”) and see what comes up. Here are some programs from UofT that can give you a better idea of what I am talking about:

- [Leslie Dan Faculty of Pharmacy Undergraduate Summer Research Program](#)
 - *Fun Fact: This is how I got my position at Princess Margaret! Always happy to talk your ear off about it ☺*
- [Institute of Medical Sciences Summer Undergraduate Research Program](#)
- [UHN Radiation Medicine Program](#)

Some of these programs also streamline an application for a potential research grant (more on what these are later), wow! Score! You don’t want to miss these during your search.









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McMaster engineering professors are involved in research Centres of Excellence, consult with industry and government, and contribute to internationally renowned institutes in all disciplines. Our engineers are in an enviable leadership role in research and graduate education. This results in state of the art knowledge being passed on to undergraduates.

 <p>Advanced Manufacturing</p> <p>The future of manufacturing is in higher levels of intelligent automation enabled by a systems-based approach.</p>	 <p>Digital & Smart Systems</p> <p>Increasing connectivity and digitization continues to change our world.</p>	 <p>Energy</p> <p>Energy is essential to heat our homes, make our products and fuel our cars.</p>	 <p>Environment</p> <p>Respect for the environment must be at the core of all engineering decisions in the future.</p>
 <p>Health & Bio-innovation</p> <p>Saving lives, improving health and wellness and overall quality of life are key goals of biomedical engineers.</p>	 <p>Infrastructure</p> <p>Sustainable and properly planned infrastructure improves our transportation networks, roads, community buildings, water and waste water supplies and access to power.</p>	 <p>Micro-Nano Systems</p> <p>Our devices, tools, and solutions are getting smaller.</p>	 <p>Transportation</p> <p>The way we travel and transport our goods is changing dramatically.</p>

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Download Curriculum Vitae
Visit Lab Website

Expertise: biomaterials; osseointegration; electron microscopy; mineralized tissues; electron tomography; atom probe tomography

Areas of Specialization: Biomaterials and Devices, Imaging, Sensing and Detection, Smart Materials & Devices, Biomaterials, Biomedical, Nano & Micro

Research Clusters: Health & Bio-innovation, Micro-Nano Systems, Advanced Manufacturing

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Overview

The Grandfield Research Group focuses on the development and multi-length scale characterization of biomaterials for bone interfacing applications in orthopedics and dentistry. Our research is pioneering the investigation of bone-implant interfaces and mineralized tissues with multi-dimensional (3D and 4D) and high-resolution microscopies, such as electron and atom probe tomography. The insights made through this work are contributing to the design of novel materials for improved implant success, and improved understanding of healthy and pathological bone. Other research themes in our group include the development and surface modification of bone scaffolds and implants, including 3D-printing and laser-modification.

Kathryn Grandfield

Kudos to the McMaster Faculty of Engineering for creating such a user-friendly research directory!

Profiling Your PI

Once you have found a professor of interest (POI), the next thing you want to consider is the work your PI does. Websites are notorious for being out of date and not accurately reflecting the work a researcher does, unfortunately. That's why you should take the time to scroll through their website, and search their name on google scholar, Pubmed, ORCID, etc. This also gives you the opportunity to decide if the lab and work is a good fit for you. Things you might be interested in identifying include:

Their work:

- What kind of projects have they been working on recently? Skim through recent papers they have published.
- Do they prefer lab bench (i.e. working in a lab) or observational (i.e. with participants) work? Does this line up with your preferences?

Bench work tends to be faster paced than observational study designs.

- What kind of techniques do they use and what kind of skills might you be able to learn? Of course, you won't be performing life-saving surgery, but perhaps they perform certain tests or use certain instruments that you can be trained on.

Their research team: What does their team look like? It is important to consider who you will be working with and the infrastructure of their research projects.

- Does the team encompass the culture you are looking for? Are there images of them at a social gathering or in the lab? Do they look like they are enjoying themselves?
- Is it big or small?
 - Big teams tend to be more productive, advanced, and established (not a rule, however). Big teams also mean that as a research assistant, your work will likely be repetitive and simple to support grad students' projects (also not a rule).
 - Big teams mean you are less likely to have face time with your PI, and you might report to a post-doc or a grad student instead (you know what I'm about to say).
 - Small teams may be better equipped to entrust undergrads with more responsibility. PI's tend to have more time to meet with undergrads on a regular basis. You are also more likely to meet and get to know everyone on a smaller team.
 - To give some context:
 - Big Teams: 15+ Grad Students, 2+ Post-docs, and/or multiple PIs.
 - Small Teams: 1-2, if any, post-docs, around 5 grad students
- Lastly, have they hosted undergrads in the past?

Their Publications:

- Does your PI publish regularly?
- Can you identify any undergrad names in the authorship?
- How impactful is the work they do? Consider their h-index, for example. (The h-index describes the number of papers a researcher

has published, each with the same or a greater number of citations).

This *shouldn't* be a priority of yours, but the opportunity to publish as an undergrad is always nice to have in your back pocket, and it's a great experience to have in your research career. In other words, look for it but don't set a PI aside for this reason. If you are unsure, don't worry, there are other ways to figure this out later on in the process.

Their Personality:

- What do you think about the prof? Would you enjoy working with them day-to-day? Perhaps their website is cut-and-dry, or perhaps they have a photo gallery of research shenanigans. By no means should this prevent you from reaching out, as you're much more likely to uncover their personality over email and in your eventual interview.

Reaching out—and getting noticed.

If you ask anyone who has searched for (or even secured) a research position, they will tell you it isn't easy. If I could hazard a guess, that may also be why you're here. It is difficult to make a good impression on a professor who barely knows you—let alone convince them to consider hiring you. Remember that when you ask a prof to take you on as an undergrad researcher, what you are really asking is for them to *invest* in you and your research potential. How do we convey something like that to your future supervisor? It is too bad they don't have an SI unit for research potential, otherwise, reaching out to a prof would be easy. Instead, professors use (what I like to refer to as) *surrogate measures* to determine whether or not they are going to give you a position in your lab. I present to you: *The Great Chain of "Do I hire you."*

The Great Chain of "Do I Hire You"

There are a lot of considerations PI's make before hiring a student. Knowing what matters to a PI can really help you strengthen your application. Below is a rough workflow of these factors as well as some helpful insight on how to navigate them as an applicant:

Is there a position for this student to fill in my lab? Let's face it, if a position doesn't exist, then your potential PI will have a really difficult time providing you with one. This could be for several reasons, some of which are a little more *malleable* than others. First, and most unfortunately, a professor may simply not desire to take on an undergraduate student. Another reason a prof may not have any positions is due to extenuating circumstances such as COVID-19—with shutdown protocols every which way, it can be really difficult to take on a student with little to no experience, especially when safe operating procedures prevent you from getting the training you require to be useful in the lab. It is also possible that positions have already been filled, which is why timing and early planning is important for a successful application (I'll speak about timing in a later section). Lastly a professor may decide that they don't have the funding to “invest” in your research potential. As I said before, some of these reasons are more condemning of your application success than others, so keep reading to consider your options.

Is the applicant a strong candidate? Unfortunately, there are often more applicants for research positions than there is space available in the lab. This means that professors are faced with the gruesome task of determining who they feel has the greatest research potential, and who will be most likely to thrive in the research setting. A strong CV/resume and academic transcript are the first signs that a PI may use to gauge a student's research potential. These documents will help convey your ability to adapt to new and challenging scientific problems. They will also serve to demonstrate your ability to grasp abstract concepts and puzzling questions that characterize the research field. Keeping these documents up to date and including them in your application (as will be discussed later) will help you show your POI that you are a worthy candidate for the position!

Does the applicant carry an award? Undergraduate research awards are usually monetary funds that go towards supporting undergraduate research opportunities and skill development. Awards can go a long way in research. Why? They provide your potential PI with a cash infusion that they can use to “invest” in your research potential. In other words, carrying an award means that your working wage is partially covered, making you a much cheaper and attractive hire. Awards also communicate that others believe in your research potential, so much so, that they will pay someone

to hire you. If that isn't a surrogate measure of research potential, I don't know what is. If you aren't walking into research with an award, don't worry, neither was I! There are other opportunities to strengthen your application.

Is the applicant eligible to apply for an award? Some awards and research grants are available at different times than others. While some may be first year entrance awards, others are distributed early into the winter term. More info on this following our discussion on interviews!

If you don't have an award, that's okay! But if you want one, you will need to keep your grades up, as you'll need (ideally) a 10+ average (3.7 GPA) in order to be competitive for most research grants. You should also look for opportunities to strengthen your CV, acquire good referees, etc. If you don't have this kind of average, not all hope is lost! Plenty of people I know have been recipients of research awards with lower GPAs. It is at this point that the professor may want to see your grades to see if you have a good shot at an award.

A common and competitive award is the NSERC USRA, but some universities may offer faculty-specific undergraduate summer research programs that come with a research grant, as I mentioned earlier in our search for a position. Check out your faculty website and inquire about any faculty-specific research programs that may exist. Again, more on this later on.

At or around this point, a professor will make the decision to interview you for a position and get to know you a little more. Here is where more of those wonderful surrogate measures come in.

Does the applicant appear competent? Although this may seem a little harsh, it is important that your PI is hiring students that they feel will be able to keep up with their work and learn relatively quickly. This does not mean you need to understand their work inside and out or be able to write a 20-page literature review. Instead, can you hold a conversation, understand fundamental concepts and learn something you are likely to know absolutely nothing about? Are you capable of making a genuine contribution to the lab? Chances are they will give you the benefit of the doubt here, but bear in mind that they are looking for this.

Does the applicant convey a genuine interest in the work? This is likely to be of high priority to your potential PI. As a student, it is easy to understand that your best work shines through in the things you enjoy. If, in your interview, you appear bored by the conversation at hand, the PI may decide that you would not take away as much from the experience and proceed with another applicant.

Is the applicant a good “fit” for my group? This is a priority that differs between profs but is important to some degree in all research groups. If you present as arrogant, unreliable, difficult to work with, or something similar, your potential PI will likely be apprehensive to hire you. Research is a team sport! INSIDER TIP: Some professors assess “group fit” through a lab tour, or conference call with the other grad students in the lab.

Why does the applicant want a position? Many PI’s will be interested to know why you want to be a part of their group. Why this group? Why research in general? What are your future aspirations? Be prepared to answer this question and share where your future ambitions lie. Are you testing the waters of research to see if it is for you? Are you pursuing a career in research and development? Are you trying to pad your resume? PI’s want to know that this opportunity is going to someone that is going to make the most of it! PI’s also use undergraduate research positions to attract potential graduate students, so communicating long-term interests in research could be an asset to your application.

Other Surrogate Measures: These little dribs and drabs of who you are will pepper your application for better or for worse. Some are of higher priority than others, but you should aim to show positive notes in them all for a strong application:

- *Time Management:* This can be conveyed by sharing an experience where you demonstrated strong time management skills. It can also be communicated by applying early (I’ll speak more about this later), and by replying promptly to emails they send you.
- *Organization/attention to detail:* Research is a meticulous field by definition. This can be conveyed in the structure, formatting, grammar, and error-free spelling found in your application and curriculum vitae (CV). Consider getting a friend to review

everything you send to your PI beforehand so you can prevent these errors!

- *Professionalism/Maturity*: Labs perform very delicate work and resources can be extremely expensive. Abuse of privileges and foolery with equipment can have huge implications. It is important to convey that you take the position seriously in your interview through your outfit, mannerisms, and banter.
- *Reliability*: Research is, again, a team sport! You will need to convey that you understand the responsibilities of your position as they pertain to you as well as the rest of the team.
- *Curiosity/Critical Thinking*: Research is largely about thinking critically and synthesizing information to inform next steps. In your interview and potential lab tour, it is important to express your interest in what your PI is sharing with you. Asking thoughtful questions is really important here for best results.
- *Grades*: Sometimes, grades are an important measure for your potential PI. Grades can help you to demonstrate your scholarly growth and academic commitment. They also communicate that you have a strong work ethic and are capable of thinking critically/intelligently about things—not to mention that they will help you in securing a research award!
- *Oral and Written Skills*: Lab work and calculations are only half the battle in research. PI's are also looking for students that are capable of communicating and summarizing findings for the greater scientific community. You will convey these skills through a combination of your grades, your written application and CV, as well as your face-to-face interview.
- *Personableness/collaboration*: This goes hand-in-hand with being a good fit for the group. Your potential PI wants to know that the student they are hiring will be able to collaborate with pre-existing members of the group whilst contributing to a positive and productive working environment. Consider sharing a passion of yours outside of the academic environment, such as a sport you play or a hobby you share with others.
- *Perseverance/good work ethic*: Last but not least, research can sometimes be a slow, frustrating, and even boring process. It is important to convey that you are able to motivate yourself, overcome unexpected challenges, and push past failures. Try to

communicate your ability to persevere through an example in your interview, if possible.

Commonly Misconstrued Measures: These measures are commonly mistaken as being overly important, the “be all and end all,” or absolutely necessary to secure a research placement. You should know that these are not nearly as important as you think.

- *Research Experience:* Although generally considered a plus, you do not need research experience to get a research placement—everyone has to start somewhere, right? The important thing is to acknowledge that you still have lots to learn and communicate that you are willing to work hard at it! This job is about acquiring basic research skills and gaining exposure to a career in research.
- *Super In-depth Knowledge of the Topic:* Although generally considered a plus, you do not need to know *a thing* about the project you will work on to succeed in the position. I can guarantee that those who market themselves as knowing everything will learn just how much they *don't know* soon after they begin their placement. In fact, the majority of research positions begin with a literature review for this very reason. Simply be honest and open up about your knowledge gaps, they aren't as big a weakness as you think.

Getting an Interview

Alrighty, now that you know all about what goes into The Great Chain of “Do I Hire You,” it is time to get you an interview. There are many approaches to arranging a meeting with a POI, each depending on a number of factors. I'll go through the most common scenarios below.

You Know the Professor and the Professor Knows You

There is no question that you are most likely to land a research position with a prof you know well, and who (ideally) knows you well too. These are the profs with whom you may have worked with in the past, or whose course you have taken (and hopefully did well in). You can approach these profs in several ways, but the following are my recommendations for initiating an interview:

Approach them after class: Profs tend to stick around after class to ask questions and converse with students. This is a perfect time to express interest in their research and pop the question of whether they are looking for undergrads to join their lab. Suggest that you arrange a time to meet, discuss the work they do, and any opportunities that may be available.

Attend their office hours: Office hours are another great time to get in contact with your prof, but only under the following conditions: There are no other students waiting to ask questions, and the prof is willing to converse about things outside the course. Etiquette is important here because it conveys courtesy and respect for the prof's working hours, as well as other students.

Email them: Profs are highly likely to respond to an email from someone they know or recognize from their class. Start by introducing yourself again so they recall who you are and how they know you. Feel free to elaborate on your interest in their work, reference something they said in class, and then inquire about any opportunities they have for undergrads in their lab. Keep in mind the Great Chain of "Do I Hire You" surrogate measures: try to weave in why you are interested in their work, what you hope to gain, and any relevant experiences you may have. Make sure to attach your most recent curriculum vitae or resume and academic transcripts to the email.

SAMPLE EMAIL TEMPLATE FOR: A PROF WHO KNOWS YOU

From: USE YOUR UNIVERSITY AFFILIATED EMAIL

To: EMAIL EACH PROF SEPARATELY, DO NOT GROUP CC or BCC.

Subject Line: I'd suggest including your name in the subject line along with something like "research inquiry"

Body: Here, you can follow this general workflow:

Dear Dr. Blank,

Introduce yourself: your name, program/major, year. Mention how you know the prof and how they might know you (eg. A class or a special event), unless they know you very well.

Pose your research inquiry, give them context as to why you find their work interesting, where your interest in their work stems from, how you came across their lab, and how the position can help you achieve your long-term goals. List any relevant experiences you have that would make you an even better candidate, but don't sweat it if you don't have any experience... Instead, use the space to let them know how appreciative you would be for the opportunity to learn.

Invitation: Invite the prof to review your qualifications (attached as PDF's). Invite them to set up a time to meet and discuss the work they do in more detail and any opportunities that they may have for you. Lastly, GPA permitting, let them know that you'd be interested in applying for any research grants that they may have in mind. If you mention applying for an award, it is highly recommended that you attach your transcript. If you already have an award, the transcript isn't as necessary.

Signature: Create a professional signature with your name, program, university, phone number, and LinkedIn profile.

**It is important that these are personalized to each of the POIs you are sending an email to. PIs can tell if you have taken the time to give real thought and effort into apply for their lab versus when you have sent them a generic email. Showing them that you value and [want to] understand their work is worthwhile.*

The Professor Does Not Know You, But You *(somewhat)* Know Them

It is significantly harder—but not impossible—to engage a prof that doesn't know you. Now is the time to be resourceful, so read the following pieces of advice before you move onto the real challenge.

Connect on LinkedIn: Again, a prof is more likely to engage with someone whose name they at least recognize. Consider connecting with the prof on professional networking platforms such as LinkedIn. Not only does this make your name a little more familiar, but it will also allow you the opportunity to view what they do in more detail, add to your professional network, and showcase your professional development if the professor chooses to check out your profile.

Leverage A Mutual Contact: Perhaps you don't know the prof well, but a friend, colleague, mentor, or a prof you are closer with does. Depending on your relationship and how close this mutual contact is with your potential PI, consider asking them to put in a good word for you, or ask your prof to refer you to them. It doesn't hurt to build any sort of rapport you can before reaching out.

Visit Them at a Research Fair or Conference Presentation: This is a really great, low-stake way to reach out to a professor you are interested in, and it gives you a great excuse to talk about research! Consider approaching them and ask them in a similar fashion to that of “after class.”

Email them: Hopefully at this point the PI is vaguely aware of who you are, and you can freely shoot your shot.

The Professor Does Not Know You, Period.

Alright, so you have absolutely no way of building rapport with your prof and you have no choice but to send a “cold email.” Believe me I’ve been there and, needless to say, your hopes are low. That’s OKAY, though—you have surely seen worse odds. Time to give it your best effort and cut your losses. My recommendation? —Find a rather large pool of professors you are interested in and apply to as many as you can...the more tickets to the lottery you buy, the more likely it is that they will read your email, for lack of better expression.

You might be thinking, “okay Andrew, but how?” Don’t worry, this next section is all about cold emailing.

Cold Emailing

Ah, the bane of your research existence: the cold email. I’m here to say that believe it or not, cold emailing is not as bad as you think as long as you take the appropriate steps. The following example email template is what I used to secure a research position this year. If I’m being completely honest, unless I know the prof incredibly well, this is my go-to template for just about any research inquiry. The strategy is to use the body of your cold email as a cover letter, as if you were writing a semi-formal job application. Remember that you are constantly grappling with the fact that the prof has no context and knows nothing about you, so be detailed, articulate, and succinct.

SAMPLE COLD EMAIL TEMPLATE

From: USE YOUR UNIVERSITY AFFILIATED EMAIL

To: EMAIL EACH PROF SEPARATELY, DO NOT GROUP CC or BCC.

Subject Line: I'd suggest including your name in the subject line along with something like "research inquiry"

Body: Here, you can follow this general workflow:

Dear Dr. Blank,

Introduce yourself: your name, program/major, year, interest in research.

Pose your research inquiry ***You can experiment with it here or at the end of the email***, it is no surprise that you're emailing for a position, though.

Give a brief background: Your general interest in research (perhaps what drew you to research), followed by your interest in their specific field of work. Share any relevant research experiences you have, including any publications and research awards you have received. If you don't have any research experience, consider sharing another work experience that has equipped you with some of the surrogate measures mentioned earlier. You can also connect academic experiences you have with their work to communicate your preparedness for a position with their group. Don't be afraid to flex a little, but not to the point of arrogance.

Give it relevance: Speak about why you want the position and why you want to work in their lab. Articulate your long-term goals and how this position contributes to them.

Extend the invitation: Invite the email recipient to review your qualifications (attached as PDF's). Invite them to set up a time to meet and discuss the work they do in more detail and any opportunities that they may have for you. Lastly, GPA permitting, let them know that you'd be interested in applying for any research grants that they may have in mind. If you mention applying for an award, it is highly recommended that you attach your transcript.

Signature: Create a professional signature with your name, program, university, phone number, and LinkedIn profile.

Additional Considerations

Before drafting/sending your email, consider the following:

Who Should You be Emailing? This is an important piece of information to acquire before you release your email to the abyss: what address should you use? Check the prof's website or faculty bio for an address made specifically for inquiries. Perhaps a post-doc or grad student does the hiring for the group. If you can't find any sort of email like this, go ahead and email the prof directly.

What Should You be Emailing? Make sure you are providing all the necessary information to give the professor a full picture of who you are. Resumes are okay, but a CV is best. If you are confident in your grades, you should also attach your academic transcript, along with anything else that may be listed in the career section of the lab website (e.g. a reference letter).

When Should You be Emailing? Timing is important and can dictate whether or not your email gets read, ignored, or buried in the PI's inbox. It can also dictate the availability of positions and your eligibility for research awards. For best odds, start emailing sometime between Mid-November and early December. Time of day is also important: my recommendation is to email early in the morning, so your message is at the top of their list, less likely to get lost, and sent at a respectful hour. To save yourself some valuable sleep, schedule your emails to send ahead of time. That said, I saw best results when I emailed on a Wednesday night at 11:00 pm, though the results aren't statistically significant, $p > 0.05$;).

Following Up? Be careful not to annoy the prof or disrespect their boundaries. Follow up no more than twice for any given prof...ideally only once. Your follow up should be a gentle reminder of your email, another invitation to meet, and an inquiry regarding anything else you can provide for them to best consider your application. As a rule of thumb, I send my first follow up after 3 days, and my second follow up after a week or so.

Nailing Your Interview

Sweet! If you've made it this far, it means that your email skills are on fire and you are well on your way to securing a research position. The next step, and no less intimidating, is your interview. Remember that your research interview can take many forms, depending on the PI. Here are some research interview styles that I have personally been privy to:

Research Interview Styles

The Informal Interview: These are laid-back “conversations” more than they are a full-out interview. In an informal interview, the prof will invite you to chat about their research interests, your research interests, the kind of work they do, and more. Sometimes, professors will invite you for one of these before inviting you for a formal interview. Be ready to share what your interests and ambitions in research are, how you came across this PI's work, and what you would ideally like to get out of a research placement.

The Formal Interview: These are more like the job interviews you hear about in the industry. Be prepared to talk about the things mentioned in an informal interview, plus experiences and roles you have taken on in the past. Be prepared to talk about experiences that showcase your ability to take criticism, exhibit perseverance, or that demonstrate strong conflict resolution, time-management, or collaboration skills. I have never heard of a PI that outright quizzed their candidate on their past publications, so while it is nice to read their work ahead of time and prepare to make conversation about it, do not feel like you need to be an expert. Be humble: if you are trying to impress them and end up saying something utterly incorrect, it could reflect poorly on your application.

The No-Interview-At-All: Woah! Congrats! The professor must be really impressed by your application. While this is great and all, be wary: why would the PI hire someone they've barely corresponded with...over email? Consider thanking them for the offer and requesting a meeting with the professor and/or the group before you commit to the job. Make sure that you understand the kind of project and team you will be contributing to so that you know what you are getting into.

The Lab Tour: While this may really just be a lab-tour, sometimes lab groups may use these tours to learn more about who you are and whether you'd make a positive addition to the lab. Be your best self even in this environment: make conversation and convey your interest with intermittent questions that display your research-oriented mind at work.

Asking Good Questions

Asking good questions is an important component of your interview. When your POI asks if you have any questions for them, you have the chance to truly communicate your aptitude for research. In other words, do not pass on the opportunity to ask a question!

Fortunately, good questions aren't as hard to pose as you might think. A good question has less to do with complexity and more to do with meaningful thought—about both research in general, and as an applicant to their lab. Remember that interviews go both ways, and this is your opportunity to make sure that the job they are offering is a job you are interested in...otherwise, research will forever leave a bad taste in your mouth. Here are some great questions vetted by a graduate student I used to work with. Guess what? He interviews undergrads for positions all the time, so listen up! Of course, don't ask them all, but pick and choose a few you are most curious to know, or blend some together for a 2-for-1 deal. Here we go:

The Position: These questions will help you uncover more about the role undergraduates take in this group. Colour me presumptuous, but I would find it hard to believe that an undergraduate student is looking to do the same, tedious task that isn't even related to research for the entirety of the term. Of course, there will likely be a balance of more and less interesting parts of the role. Use these questions to assess the work environment you'll be joining and what place you'll have in it. These questions might even prompt your potential PI to take you more seriously (as they should, you've done your homework) and may even organize a more fulfilling role for you to take on.

- *How do undergraduate students fit into your lab?*
- *What kind of skills might you expect me to bring to this role? What kind of skills might I be expected to learn?*
- *Who might I be working with as an undergraduate student?*

- *What kind of tasks have past undergraduate researchers performed in your lab?*
- *What does a day in your lab look like?*

The Project: These questions will help you uncover more about what research topics you will explore, what techniques you will be exposed to, and what kind of opportunities there are for you in this group.

- *What kind of projects are you currently working on that I might be able to help out with? Is there a project that you might have in mind for a new undergraduate student?*
- *What kind of skills and techniques can I expect to learn?*
- *I saw in one of your works that you performed [insert technique or interesting method], is this something I might be able to learn?*
- *I was really excited by what I read in this paper [reference paper], is there a next step in this work that I might be able to contribute to?*

Other Scholarly Opportunities: Interested in establishing yourself amongst the research community? You might want to seek out opportunities to publish in your group. Use these questions to get a feel for whether these opportunities are available for undergrads in your potential new lab.

- *Are there any opportunities for undergrads to publish their work in your lab?*
- *What kind of works have undergraduates contributed to in the past?*
- *Are there any opportunities for undergrads to design their own projects related to something their supervisor is working on?*
- *Are there any papers your grad students are working on that I might be able to help out with?*

Logistics: These questions are more realistic and aim to check all the extra boxes you might need to consider, especially special circumstances that might complicate your research term, like COVID-19. Feel free to ask these if it seems like they need asking.

- *Would this position primarily be online? Are there any opportunities to come into the lab or observation site?*
- *Is there any specific training I will need to do to prepare for this role?*

- *Is there a research award that you think I should be applying for? Is this something you would be willing to support me through?*
- *Anything else you might feel is relevant here.*

Extras to Wow Them: A question like this is rarely ever asked, but *wow* does it ever communicate how confident, eager, and ready you are to really make a great addition to their group.

- *Do you have any recommendations on papers I should read that would be most representative of the work I'd be doing?*
- *Are there any papers you'd recommend reading in preparation for this role?*

Student Research Awards

As I've alluded to before, it can be beneficial as a prospective research student to carry a student research award, or grant. The purpose of these grants is to subsidize your training and employment as a research student, or fund materials for the project you will be working on. Running a research lab is *incredibly* expensive, and so a research award that can help pay for a student's wage is very desirable!

At the time of application to a lab, the majority of students will not yet hold a research grant or award. As we mentioned before however, it is always good to discuss filing an application for one of these awards during your written application or your interview. In some labs, applying and successfully securing a research grant will be a requirement for their employment, while in other labs, supervisors may hire a student with or without one. This boils down to the resource constraints and preferences of your PI.

Keep in mind, not all PIs will require you to apply for a research award. Many are happy to hire students using their own research spending budget. In a situation like this, it is up to you to decide whether or not you'd like to apply. If your supervisor does not require an award but is willing to apply, go for it! Not only will it look good on your CV, but it will strengthen your application to future research positions and programs.

What Kinds of Research Awards Are Out There?

There are so many research awards out there, if you work hard enough to find them! Some research awards are funded by the government, while others are funded by a foundation or private institution. Certain research programs offered by different faculties may also offer stipends to competitive applicants. To get you familiar with some of the awards, here are some of the more popular undergraduate research grants:

- [Natural Sciences and Engineering Research Council of Canada \(NSERC\) Undergraduate Student Research Award \(USRA\)](#)
- [BioTalent Canada Student Work Placement Program \(SWPP\)](#)
- [BioCanRx Summer Studentship Program](#)

Some awards may require students to work in a specific type of research, so be sure to discuss this with your supervisor and confirm eligibility before doing the legwork to apply.

How Do I Get a Research Award?

Most research grants/awards require a two-part submission, with one part completed by the student, and the other completed by the supervisor. As such, you will need to have a supervisor agree to file an application with you *prior to your application*. Ah-ha! This is why I told you to inquire about applying for an award in your written letter/interview...the beauty of foreshadowing.

Once you have agreed with your supervisor to apply for an award together, the rest of the process is quite straightforward. In general, supervisors will have plenty of experience applying for an award, so don't fret if you don't have much experience with it yourself. To help make things a little easier for you, I have included a very brief overview of how the process usually works. As well as some tips in *italics*:

- 1) You and your supervisor agree to file a joint research grant application.
 - *Get on this as soon as possible to avoid missing the deadline.*
- 2) Create an account on the grant application portal, or, download all necessary documents from their website.
 - *Reach out for help from administrative staff if you need it!*

- 3) Complete your side of the application. Your part of the application will usually include a few main items:
- a. A record of your academic performance (usually a scan of your official transcript, or an unofficial transcript PDF document)
 - *Make sure you confirm if the application requires an official transcript, because these have a longer turnaround time.*
 - b. A record of your previous achievements or distinctions (you will usually have the opportunity to list a few of your accomplishments to demonstrate your merit).
 - *Put forward the achievements/distinctions that entailed the highest degree of competition, these will best demonstrate your competitiveness for this award.*
 - *If possible, put forward at least one achievement that is academic in nature, as you are applying for an academic award.*
 - c. [Sometimes] a written statement.
 - *Remember to convey your interest in research and what you hope to get out of this experience!*
 - d. [Sometimes] a curriculum vitae or resume.
 - *Remember to tailor this document for a research-specific application: Highlight any past research experience, courses, or projects that demonstrate components of the scientific method.*
- 4) [In some programs] You will receive a pin or ID number that your supervisor will use to link their side of the application to yours.
- *Complete your side of the application as soon as possible so that your PI can begin on theirs... Some PIs can be concerningly slow with submitting their half of the application so start early to avoid deadline-stress!*
- 5) If applicable, compile both components of the application and all necessary documents and submit your application before the deadline.
- *Remember to email the documents to anyone outlined in the application instructions as well.*

- *Copy your supervisor on application submission emails when possible, to keep them in the loop.*
- 6) Now we wait! Most programs field applications anywhere from late January to early March and take up to a few months to get back to you. If you receive an award, you will be notified, so keep an eye on your email!

I Applied for a Research Award, Now What?

Applying for an award will have three main outcomes:

- 1) **Your application is successful:** Congrats, not only did you win the award (great for your resume!) but you also secured your research position. Time to celebrate!
- 2) **Your application is unsuccessful:** I'm sorry to hear. Don't take it personally, these selection processes for these awards are very competitive and often based on very little information about who you are and how deserving you are of the award. You can always try again next year! Now comes two possible scenarios:
 - a. **Your PI hires you anyway:** Phew, no skin off your back. Congrats on your position and putting yourself out there. Good luck next time on the award!
 - b. **Your PI decides not to hire you:** Unfortunately, some researchers cannot afford to hire and train a new student strictly using their own funds. Don't take it personally, they would hire you if they could! Seek other opportunities to pursue research in the summer... some programs take applications right until April, so it probably isn't too late to find something 😊

Farewell

All good things must come to an end! Thank you for taking the time to read this document, I hope you found it most helpful in your journey as an aspiring researcher! I wish you the best of luck in navigating this (hopefully less confusing) process.

If there is one thing I can ask: pay it forward! We all need a little mentorship here and there. Create a community of support and encouragement for one another. By no means is undergrad an easy process, and it can be even harder to go through alone. If you know someone that you think may benefit from this document, please share it with them.

Of course, if you have anything to add to this document, please feel free to contact me—I'd be happy to incorporate your feedback! Future generations of student researchers will surely thank you for it.

Take good care,

Andrew D'Elia