

A Crowdsourced Guide to Research for EEB Students

Created by YEEBUG and the Peer Mentors (2019-2020) and contributed to by the YEEBUG community (2021-)

General research advice and resources

1. Why do research?
 - It's fun!
 - Making lasting contributions to E&EB and related fields
 - Research experience is important for many E&EB-related careers, even if the precise research you do isn't what you end up pursuing (that's super common and totally okay)
 - particularly important for grad school, academia, and med school
 - Get credit--thesis, research for credit
 - You could get published, do fieldwork, meet people, and attend fancy conferences!
2. Options for labs
 - Departments: E&EB is very chill about who you do research with for your thesis. As long as you can justify that it's related to ecology and/or evolution, you can make it work. If you find a lab you like that's not strictly in the E&EB department, meet with Professor Prum to double check that they'll be cool with that research, but I have never heard of someone getting turned down for a thesis topic because their work wasn't related enough.
 - E&EB
 - MCDB
 - Anthropology
 - Geology and Geophysics
 - Forestry and Environmental Studies
 - Environmental studies
 - Environmental Engineering
 - MB&B
 - Psychology?? (maybe)
 - Med school
 - Public Health school
 - YURA database <https://database.yuraresearch.org/>
 - Ask peer mentors to point you in the right direction
<https://eeb.yale.edu/academics/undergraduate-program/peer-mentoring>
3. Getting in touch with professors
 - Email them
 - Ask to meet face-to-face and give specific reasons you're interested
 - Ask to discuss generally what they do for research (you don't have to commit in the email!)
 - If you have specific questions about wording emails, come talk to us!

- If they don't respond, you can follow up after a week or two, or check back the next semester--sometimes professors miss emails.
 - Talk to them after lecture
 - Ask one professor for a referral to another if the first one can't help or doesn't have openings
 - Read papers (or at least the abstracts) to get a sense of what projects the lab is focused on, what you might be interested in, what methods are used, etc.
 - It's a two-way street: use a meeting with a professor to figure out whether they are a good fit for you, not just the other way around.
 - Don't take it personally if the lab is full, or if a potential mentor doesn't respond.
- 4. Lab culture
 - Lab meetings
 - Are there formal lab meetings? What is the structure of a lab meeting?
 - Who's talking? Is it hierarchical, do you feel comfortable speaking?
 - Small intimate lab vs. large lab with lots of diverse projects/people
 - Talk to grad students and other undergrads in the lab
 - Ask the PI what their mentoring style is: how often will they meet with you? How do they want you to report to them?
 - Are there retreats, times for people in the lab to meet up outside of the lab? Do people tend to eat lunch together?
- 5. Finding/coming up with a project
 - Professors may have pre-existing projects, or they might prefer for you to come up with your own. Different professors and labs differ on this: some are open to either way of doing things, others have a pretty set method.
 - If you don't know yet what you want to work on, that's okay! Talking with a professor initially can help you get ideas, and it might be a good idea for you to work on a project that's already somewhat set for you.
- 6. Fitting research into your life
 - Decide in advance how many hours per week you'll work in the lab
 - It can be helpful to schedule specific times to focus on research so it doesn't conflict with other commitments
 - Create a short-term plan
 - What are the main deliverables for the semester?
 - What are your goals--what do you hope to learn?
 - Talk this over with your professor or grad student mentor to make sure you're both on board with how much you'll be accomplishing. Set realistic expectations. Remember, you're a student first, and you won't be working full time like their grad students.
- 7. Dealing with problems that come up during research
 - If you're stuck, ask other lab members for help!
 - Your mentor is there to *mentor* you: be honest about what you're struggling with.
 - Even if your PI is very busy, make sure to reach out and set up semi-regular meetings.

- Come talk to the peer mentors at any point, especially about anything you might feel uncomfortable sharing with your PI.
8. Formalized research
- Research for credit
 - Yes, a full credit!
 - Graded pass/fail
 - A short (~2 page) proposal at the beginning of the semester, and a longer paper (~10-12 pages) at the end of the semester in the format of a scientific paper to describe what you did
 - Minimum of 10 hrs/week (but no one is checking with a stopwatch)
 - Summer research
 - Could get funding through a fellowship, or less commonly could get paid by PI
 - Senior thesis
 - Can be 1 or 2 semesters
 - Proposal at the beginning of the first semester (2-3 pages)
 - Short progress report at the end of first semester
 - Some faculty expect you to work with them the summer prior to senior year as well. This is not to say that staying here the summer before for research is necessary, but if you have a specific lab in mind, ask them well in advance.
 - Thesis due at the end of second semester (or first, if you're only doing 1 semester of senior research): usually 25+ pages
9. Official department requirements
- Two tracks
 - BA vs. BS
 - BA requires senior essay, BS requires 1-2 semesters of senior research

Upper-level students' experiences

[e.g. name, what lab you're in, what your research focuses on, how you got into the lab, previous labs/experience if applicable, lab culture, advice for people based on your experience, etc.]

Kaija Gahm (kaija.gahm@aya.yale.edu)

Lab: David Skelly (Forestry/E&EB) (<https://campuspress.yale.edu/skellylab/>)

Research question: Is there an evolved tradeoff between growth/developmental rate and swimming performance (e.g. speed) in wood frog tadpoles?

Study species: Wood frogs. The lab also works on salamanders, macroinvertebrates, other frogs, lizards, etc.

Lab research focuses: Amphibian ecology, microevolution, geographic distribution, etc.

How I got involved: A friend recommended that I reach out, so I emailed the PI. He invited me to a lab meeting, and I liked the culture, so I had some follow-up meetings with him and one of his PhD students to talk about which projects I might want to pursue. This was around December of

my junior year. Then in January/February, I worked on writing a proposal for field/lab work in the summer between my junior and senior years. Now I'm continuing that work as part of my senior thesis.

Lab culture: The lab was really small when I joined (like 7 people total), but we have since added a bunch more students, so now it's more like 15-20. Everyone is super friendly, and even though the PI is the director of the Peabody museum, he welcomes everyone to talk in lab meetings, he checks in to make sure you're ok, and he's pretty responsive considering how many commitments he has. That said, I have worked most closely with one of the PhD students (who I get along really well with!) and I generally interact more with the grad students in the lab. I'm not necessarily super into frogs (I don't think frogs are my life's calling), but the supportive culture in this lab has been really awesome and helpful for me.

General advice: I switched labs partway through my time at Yale, and that's definitely something you can do! Don't be afraid to reach out and to change course. It's almost never too late, and if it's too late in one lab, there will be others you can talk to. Take your cues from people in the lab. If they're friendly, that's a good sign. If they don't respond to your emails or seem short with you in meetings, that could potentially indicate that they won't be great to work with. **Definitely** look outside the E&EB department proper! You can work with professors in related departments and it's totally fine.

Matt Hack (matthew.hack@aya.yale.edu)

Lab: Richard Prum (E&EB) (<https://prumlab.yale.edu>)

Research question: Is *Vireo sclateri* (the Tepui Vireo, a small South American songbird) one species, or more than one species?

Study species: The aforementioned Tepui Vireo

Lab research focuses: Ornithology, sexual selection and aesthetic evolution, behavioral evolution, phylogenetics and biogeography, feathers, avian coloration, etc.

How I got involved: I reached out to my PI early on in freshman fall. He invited me to a meeting, and assigned me a small-scale morphometrics project in November; I spent about two months doing systematic bird ulna measurements. During second semester, I focused on taking Ornithology and Ornithology Lab. By sophomore fall, I had a slightly stronger vision of what sort of ornithology research I might enjoy, and my PI helped me devise my current project, which I've been working on ever since! In addition to research during the school year, I spent the summers after my sophomore and junior years working on my project. I've also worked closely with Prof. Thomas Near's ichthyology lab, which has the bench setup and phylogenetics expertise needed for this project.

Lab culture: The Prum Lab is traditionally very small; right now, besides Prof. Prum, we have four PhD students, and I am now the only undergrad (we had another who just graduated). Undergrads in the Prum Lab typically don't work under PhD students -- they work directly with Prof. Prum, which a) is fantastic, in that you have a unique opportunity to work so closely with a brilliant PI; and b) means that it's largely on you to keep your project moving forward. He's always available for help (you can waltz right into his office) but won't reach out to check in. This is a trade-off -- it's daunting at times, but also improves your research self-confidence. The Prum Lab is probably right for an undergrad who is set on birds, has a sense of their potential

research interests *within* ornithology, and feels ready to take on a challenging and independent but rewarding project. If that's not you, don't worry! Those criteria are not at all expectations for an E&EB undergrads, and there are labs with more hands-on approaches. But if that is you, then by all means go for it and reach out to Prof. Prum! (P.S. The grad students are amazing and I can't recommend them highly enough. Absolutely reach out to them for advice.)

General advice:

- 1) It's never too early to reach out! Even if you're not ready to do research yet, contact a few labs that seem interesting. In my experience, the fact that Prof. Prum had my name in mind was very helpful, even though I wasn't ready for a long-term research project during my freshman year.
- 2) If you're interested in an organismal lab, take that professor's class and its associated lab at your earliest convenience. These classes are accessible to freshmen and can be a great way to get exposure to what it might look like to study that particular organism in our department.
- 3) Befriend grad students -- I've had only good experiences with E&EB grad students and they are excellent sources of help and advice.
- 4) Err on the side of asserting yourself; if you need help and you're not getting help, don't worry about being annoying -- the PIs I've spoken to have said they'd rather a student send followup emails (or come straight to their offices), instead of the student giving up out of politeness.
- 5) Don't worry if you don't have your exact research interests sorted out -- it does not preclude you from starting a rewarding project. I'm not going to look at phylogenetics programs when I apply to grad school, but I still learned a ton and got a lot of valuable experience from my project.
- 6) Prioritize lab culture! Just because my lab has worked for me doesn't mean it will work for everyone. Especially at the undergraduate level, the exact type of research you're doing matters less than whether you build a strong relationship with your mentor. If you're not clicking with your lab, then there's a better lab out there for you, and it's pretty much never too late to switch.

Maddie Bender (maddeline.bender@aya.yale.edu)

Lab: Alvaro Sanchez (E&EB/Microbial Sciences Institute) (<http://www.sanchezlaboratory.com/>)

Research question: Is carbon source preference conserved across related species of bacteria, and how much?

Study species: Lotsa bacteria, including *E. coli*, *Enterobacter sp.*, *Raoultella sp.*, *Citrobacter sp.*, *Serratia sp.*

Lab research focuses: Eco-evolutionary feedback, predicting microbial evolution and trajectories, microbial community assembly

How I got involved: I reached out to Alvaro (and ~10 other E&EB labs) at the beginning of my sophomore year, and he replied that there wasn't any space in the lab! There wasn't a reason I emailed him in particular, besides the fact that I really liked the design of the lab website. I spent a semester working with another lab that turned out not to be a great fit. In the spring of sophomore year, I took "Evolutionary Biology," a course Alvaro co-taught. I meshed with his

teaching style and found the bacterial experiments about which he taught us to be fascinating, no doubt due to his infectious enthusiasm about all things microbial. I emailed him again after completing the class, and this time, he did have space in the lab. I met with him and a postdoc in the spring before deciding to spend the fall in the lab. I've been there ever since!

Lab culture: An illustrative anecdote: A few weeks ago, a fire alarm went off in the lab's building, which we share with dozens of other labs. We all gathered outside and waited for the fire department to get there and turn off the false alarm. After 10 minutes, our lab decided that we were not going to be let back in anytime soon and walked to the break room in another building, where we played an impromptu foosball tournament and a few rounds of ping pong, using our phones as paddles. We were the only group to do this, and while other labs were able to return to their experiments faster, we came back refreshed, having taken all our aggression at being interrupted out on the games.

We have a whole section on our website devoted to lab culture, but I'd describe it as mentoring, warm and friendly. We eat lunch together every day in the West Campus cafeteria and have a lab coffee break right after (we have a lab stock of Nespresso pods), and our conversation topics often include our experiments; general science that we think is cool; or just random interests. We have an annual apple picking trip, and get together once in a while for dinner at a restaurant or a lab member's house. The lab is highly diverse, and nearly everyone speaks Spanish — I find that labs often resemble their PIs, and this seems to be a pretty funny symptom of that phenomenon. The lab is small but growing: We're adding two postdocs and one grad student in 2020, and only two undergrads currently work in the lab, so I'm sure we'll have openings for those interested. The only drawback for me is that the lab is on West Campus, which is a 20-minute shuttle ride away from downtown New Haven on a van that comes every half hour. I've coped with it by being very deliberate in planning my week and trying when possible to spend a full day at the lab rather than two half-days.

General advice: If you don't get into your dream lab, keep in touch with the PI and try again! I didn't think to ask about mentorship style until I was joining my second lab, and my lab uses a "Rule of Three" that has really worked for me. The first time I learn a new technique, I watch someone do it; the second time, they supervise as I try it; the third time, I do it on my own and ask for help if I need it.

Zach Gold (zachary.gold@yale.edu)

Lab: Carla Staver (E&EB) (<https://staverlab.yale.edu/>)

Research question: What are some physiological responses of savanna trees to disturbances such as drought?

Study species: a whole bunch of different tree species

Lab research focuses: savanna ecology, vegetation structure, disturbance ecology, global biome distributions, etc.

How I got involved: I emailed my PI at the beginning of the spring semester during my sophomore year after finding the lab on the E&EB website, and I started out by helping others with their labwork. Towards the end of my sophomore year, I was able to propose my own project, which has led me to do field work in South Africa with some members of the lab. I am continuing this project by doing research for credit.

Lab culture: The Staver Lab is relatively new—their first graduate student is graduating this year. However, there is already a well-established culture of collaboration. Everyone is extremely friendly, responsive to emails, and willing to talk to you about their research or ideas for your research. Undergraduates are encouraged to participate (and, occasionally, lead) lab meetings. In general, research projects are not given to you; you will be expected to ask a question and design a way to attempt to answer it (with plenty of help, of course!). This is exciting because you are given ownership over your project, and there are many ways you can take it. I chose to work with plants, but you can also study birds, large herbivores such as elephants, etc. Designing and executing your own project can be daunting as well as exciting. Luckily, the lab members are very accessible and happy to provide guidance, and Professor Staver is accommodating to undergrads.

General advice: Don't be afraid to ask questions, assert yourself, send follow up emails if you don't get a response. Asking to be in a lab, especially if you are not sure you are going to stick with that lab long-term, often requires getting over the initial hurdle of feeling like you are bothering someone. In reality, most professors like having undergrads work in their lab. Once you are in a lab, lab members who you work with will generally appreciate if you make sure you are doing something right by checking/asking first instead of going down the wrong path. TL;dr: speak up for yourself.

Maya Juman (maya.juman@aya.yale.edu)

Lab: Eric Sargis, Mammalian Evolutionary Morphology Lab (Anthropology/E&EB)

(<https://meml.yale.edu/>)

Research questions: Is there morphometric variation across island populations of large treeshrews (*Tupaia tana*)? How might the current infraspecific taxonomy be revised to reflect this variation (or lack thereof)?

Study species: Southeast Asian treeshrews, though the lab also works on extant/extinct primates and primate relatives

Lab research focuses: Biogeography, evolutionary morphology, systematics, functional morphology

How I got involved: During my sophomore spring, I applied to do a Peabody/Smithsonian Internship with Dr. Sargis and his collaborator at the Smithsonian, Neal Woodman. That summer (2018) I collected and analyzed data from specimens at the Smithsonian. During my junior year, I stayed in the lab and did research for credit that spring. The following summer I continued the project and collected additional data from more natural history museums. This formed the basis of my senior thesis, which I am now working on with Dr. Sargis. We intend to publish my thesis in 2020.

Lab culture: The lab is small, usually only 1-2 undergraduates and 1-2 grad students. My PI spends a lot of time mentoring each student, and is extremely responsive to emails and questions. I think the lab stays small because he won't take on students he can't personally mentor. The grad students are super friendly and helpful, though each project is fairly distinct. My PI encourages collaboration with other institutions, which is how I ended up traveling and conducting research at other natural history museums during my summers. DISCLAIMER: my PI is on leave this semester (Fall 2019) because he just had a kid, so right now might not be the

best time to reach out. However, keep an eye out for summer internships in his lab—that's how I got involved.

General advice: Doing research is a two-way fit. It's not just "can I get into this lab?" but also, "is this lab right for me?" I know this personally, having switched labs halfway through my time at Yale. If you feel you're not getting enough mentorship/guidance, or you're just not vibing with the lab culture, listen to your gut. I did, and I ended up in a lab that proved to be much better for me. I can honestly say my decision to switch 100% changed my academic life (for the better).

Anusha Bishop (anusha.bishop@gmail.com)

Lab: Adalgisa Caccone (E&EB/YIBS Center for Genetic Analysis of Biodiversity)

Research topic: modeling genetic connectivity and habitat suitability for tsetse flies

Study species: tsetse flies, though my lab works on tons of different species depending on the funded projects going on (tortoises, mosquitos, rats, etc.)

Lab research focuses: very broadly genetics/evolution

How I got involved: During my first year spring I reached out to Dr. Caccone about working in her lab and I applied for a fellowship for that summer to work in her lab. I did a project on the population genetics of Galapagos tortoises and developed my lab skills in molecular genetics. I didn't do research in the lab during my sophomore academic year, but I worked in the lab (paid job) organizing their databases. During my sophomore summer I applied for the Tetelman international research fellowship to do field work in Sri Lanka studying the shark and ray fisheries. Junior spring, I started doing research in my lab again on tsetse flies and started working towards my senior thesis. I got a Rosenfeld fellowship the summer after my junior year and continued working on the tsetse fly project. I am still working on this project in my lab (research for credit) for my senior thesis.

Lab culture: the Caccone lab and Powell lab are highly integrated (all of our lab meetings are together and we often collaborate on projects). This means the lab group is pretty big (there are normally a couple postdocs, 5ish graduate students, 1-2 research assistants, a lab manager, and two PIs). Undergraduates tend to be paired with either a grad student or a postdoc who they will work most closely with. Dr. Caccone's door is open, but for the most part I interact/work with my postdoc mentor, which I like because they have a lot more time for me than a busy PI might, and I still know Dr. Caccone pretty well from lab and one-on-one meetings. There are currently not that many undergraduates (I think there are only 2), but the number of undergraduates depends on the projects that are going on in the lab and what skill set is needed. If you're interested in doing genetics work/working in this lab I highly recommend taking genetics and statistics classes (I wish I had done more) though it is not necessarily required. Overall, everyone is really friendly and happy to talk with anyone about their research!

General advice: get to know the grad students and postdocs in E&EB! They're incredibly friendly and helpful (and often a lot less intimidating than faculty). They have so much advice to give and can help you connect with people who share your research interests. I am applying to graduate school/fellowships right now and I don't know if I would have been able to get through the process without all of my amazing grad and postdoc mentors.

Jasmine Liu (jcliu613@gmail.com)

Lab: Simon Queenborough (YSE) (<http://www.simonqueenborough.info/>)

Research topic: Is there evidence of conspecific negative density-dependence in herbivory of tropical forest seedlings?

Study species: Lots of tropical trees.

How I got involved: I first sent an email in the fall of my sophomore year before I had even declared E&EB as my major and was still thinking about premed. I remember reaching out to around 3 or 4 labs total, since I had a vague idea that I liked plants but didn't yet know any specifics of what I wanted to do. I met Simon in his office for the first time with another E&EB student looking to do her senior thesis in the lab, and we talked through the possibilities together. I was drawn to Simon's willingness to teach -- at the time, I had never heard of R before and had no idea how research worked outside of a wet lab environment (the only kind of lab I had ever spent any time in previously). The first thing I did in his lab, then, was learn R from scratch, and Simon was willing to invest the time and energy into getting me up to speed. At the same time, I started on a project that could be done using existing data on tropical forest plots, herbarium records, and global climate data. By fall semester of my junior year, I had started planning out my senior thesis in Simon's lab since I was planning on spending the summer in a tropical forest collecting my own data, and ended up spending the summer in Amazonian Ecuador doing just that.

Lab culture: The Queenborough Lab and the Comita Lab (also in YSE) are closely intertwined and weekly lab meetings are held together. There are usually a few postdocs around, plus several PhD students, as well as a master's student or two. People are often abroad for field work for extended periods of time, so the lab can sometimes feel like a rotating cast of characters.

The environment, however, is warm and inclusive, and when people return, they do so with stories and pictures to share. Lab members are genuinely happy to work with one another and excited about each others' projects. All of this remained true even after COVID turned most everything virtual -- weekly meetings became a space to check in with each other as well as catch up and talk about science. Lab projects that could be completed at a distance were launched even after field work became difficult to impossible, which became as much a way to explore new topics and methods (for instance: sacred groves and machine learning, for two) as something interesting to do together as a team.

If you join the Queenborough lab, one of the major pluses is that you'll be working directly with Simon, rather being shuffled under a PhD student or postdoc (in stark contrast with another lab I was in with a PI who struggled to remember my name). Simon cares a lot about his students and is flexible to your interests and goals -- and it's okay if your interests and goals are still changing! You'll never be handed a project and told to carry out something tedious just because it fits with his research agenda. You also won't be "ghosted" or struggle to get a response. Additionally, most of the work you'll be doing will be from your own computer, which means that you can work on your projects from anywhere and at any time of day (which would be pretty ideal if you're reading this and looking to get involved in research in the middle of a pandemic). You'll have regular check-ins with Simon to discuss progress and next steps, so you'll never be left in the dark. An interest in plants isn't a prerequisite as much as an interest in ecology or the tropics.

General advice: If you sense something is off about the lab's culture or you're not getting what you want out of the experience, don't be afraid to try somewhere different! Walking into college, I thought I wanted nothing to do with research after a poor two years in one lab at a local university while I was in high school. The people around you should be supportive and helpful not only to you, but to each other. Make a timeline and set (realistic!) goals for yourself, and be transparent about how things are coming along and where you've gotten stuck or need assistance. I specifically remember one small instance while I was still new to R -- I probably spent a week on my own searching for how to do something small, only to have my question answered in less than 2 minutes when I finally asked (turns out, there already existed a simple function to do exactly what I was trying to describe). Spend a reasonable amount of time looking for a solution, but don't be afraid to say something if you're lost!

Take advantage of all the funding Yale has for undergraduate research, especially for the summers! If you're interested in field work, there are plenty of funding options available as long as you plan ahead and communicate with your PI. I spent a summer in coastal Germany and a summer in tropical Ecuador thanks to Yale's summer grants for undergrads.

Chau Pham (pham0326@umn.edu / chau.pham@yale.edu)

Labs: Liza Comita (Yale School of the Environment, <http://www.comitalab.com/>), Mark Ashton (Yale School of the Environment, <https://silviculturelab.yale.edu/>)

Research topics: Drivers of standing biomass and biomass change in a mixed-dipterocarp forest of Sri Lanka; Response of tropical tree seedlings to different light environments

Study species: tropical trees (including many dipterocarps)

Lab research focus: The Comita lab – plant-enemy interactions, species coexistence in diverse tropical forests, plants' responses to drought. The Ashton lab – silviculture, agroforestry, tropical and temperate forest ecology.

How I got involved: The Ashton lab – I knew that I wanted to do research on tropical forests in Asia, and Mark is the perfect person for that since he has worked extensively in Sri Lanka as well as Southeast Asia. I first reached out to him at the end of my sophomore year and we had a meeting to discuss my research interests. I spent the summer ruminating on what I wanted to work on and in the fall started working on tropical seedlings' response across a light gradient. I also started going to Mark's lab meetings. In the spring of my junior year, Mark helped me develop ideas for my senior thesis and apply for fellowships to do field work in Sri Lanka. Unfortunately COVID happened :(and since the summer of 2020 I've been working on a dataset of Mark's long-term forest plots in Sri Lanka to study the relationship between diversity and ecosystem function for my senior thesis.

The Comita lab – I was introduced to Liza and one of her PhD students by Mark in the summer of 2020. The PhD student and I have the same interest in the mixed-dipterocarp forests in Sri Lanka, and we have been working together on a joint project since then. Liza has also been co-advising me on my senior thesis, and I also regularly go to the Comita lab meetings.

Lab culture: The Ashton lab usually consists of 2-3 PhD students, 2-3 Master's students, and 1-2 undergrads. Lab meetings are biweekly to weekly. Normally, Mark would provide food and drinks for these meetings, but we haven't been able to do that this past year. What I love most about the lab is that everyone's research interests are so diverse. We have people who study

urban forestry, tree allometry, forest fragmentation, forest restoration in coal mines, tree community ecology, etc. The atmosphere in the lab is always very laid-back and informal, and Mark is just a very fun person to be around.

The Comita lab has joint meetings with the Queenborough lab. The general atmosphere in the lab is very welcoming and collaborative. For example, lab members have worked on research projects together as a group. And the fact that Liza (and Mark) facilitated the partnership between me and her student just goes to show how much they value collaboration. I also love that their lab meetings are not always purely about science but other science-related topics as well, e.g. the use of social media in academia and science communication.

Finally, both Liza and Mark are wonderful people who care a lot about their students. They make sure to answer all of your emails and give you a lot of freedom to ask your own research questions. At the same time, they provide very helpful feedback to help you refine your question, interpret your results, and build a narrative for your research paper.

General advice: Don't be afraid to ask grad students questions, whether they are related to statistical analysis, their research, or grad school. I have found that grad students generally love to help! Also, finding a lab, mentor, or research area that is the right fit for you is very important. Undergraduate research is less about sticking with a project to the end but more about experimenting and finding a topic that you're truly passionate about. So don't be afraid to change labs! I myself was in a different lab before, but my research interest shifted a bit and I'm glad that I made the decision to join the Ashton and Comita labs.

Anthony Sarkiss (anthony.sarkiss@yale.edu)

Lab: Erika Edwards (E&EB, <http://edwardslab.org>)

Research topic: Investigating whether the replicate radiations of several *Viburnum* species were driven by physiological adaptation to microclimatic differences in the cloud forests of Mexico

Study species: nine Southern Mexican species in the *Oreintotinus* clade of the genus *Viburnum*

Lab research focus: *Viburnum* evolution, phylogeny, and natural history; the evolution of CAM and C4 photosynthesis

How I got involved: I had been previously involved with the [Jacob Lab](#) (MCDB, focus on plant epigenetics), but decided that I wanted a thesis with a focus in evolutionary biology. I happened to hear about the Edwards Lab from an enthusiastic graduate student as I was considering topics of research, and I found that my interests coincided with the lab's, especially in terms of plant evolution. I reached out to Professor Edwards my junior year, and as we fleshed out the details of my thesis, I helped out on different projects to learn the feel of the lab as well as the methods used (even remotely, throughout parts of the pandemic, as I georeferenced Peruvian succulents from herbarium records!). I have since been collecting physiological data on the species in my study in Marsh Botanic Gardens and in the wet lab in OML.

Lab culture: The lab has 3 postdocs, 3-4 grad students, and 1-2 undergrads. We have weekly lab meetings, and we share lab space with the Dunn Lab, in OML, as well. Though most of my relationship with this lab has been virtual, I have found a very supportive and informally collaborative environment where I could be as independent as I wanted with my experiments, while asking for the support I needed. Professor Edwards and other mentors in the lab have always been helpful and generous with their time.

General advice: Don't be afraid to start research early in your undergraduate career, and feel free to explore different labs! Though I had a wonderful and very informative experience at my first lab, I am also glad to have gained research experience in different subfields. Most importantly, I would say, take ownership of your curiosity and let it guide your research--follow the experiences which you are internally motivated for.

PS. if you're interested in plants, finding your way into research opportunities in Marsh Botanic Gardens are key for warm and summery New Haven winter experiences!