

Practical Tips for Intentional and Inclusive Recruiting and Hiring for Academic Research Laboratories

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Abstract. Hiring decisions are some of the most important choices PIs make for their research groups. Whether it is undergraduates, graduate students, postdoctoral researchers, or other research assistants, trainees are pivotal for the success of a research group. Choosing an effective team can lead to synergy amongst researchers, high creativity, and groundbreaking science. Choosing an ineffective team can lead to infighting, toxicity, low morale, and scientific stagnation. These same hiring decisions are critical in creating an equitable and inclusive lab environment. Importantly, the challenges for creating *productive* and *inclusive* lab groups align: both can be achieved by (i) advertising broadly to ensure a high number of qualified potential researchers apply and (ii) removing unconscious selection bias in the hiring process such that these highly qualified researchers are hired. Intentionally and deliberately incorporating these two steps into the recruiting and selection processes aid in the recruitment of a more effective and inclusive research team. Here, we describe practical advice for intentional and inclusive recruiting for academic research labs. We focus on three areas: advertising your research positions, assessing candidates for research positions, and assessing your hiring practices. In each, we give guiding principles and practical tips for designing an equitable and inclusive hiring process for academic labs.

Hiring decisions are some of the most important choices PIs make for their research groups. Whether it is undergraduates, graduate students, postdoctoral researchers, or other research assistants, trainees are pivotal for the success of a research group. Choosing an effective team can lead to synergy amongst researchers, high creativity, and groundbreaking science. Choosing an ineffective team can lead to infighting, toxicity, low morale, and scientific stagnation.

These same hiring decisions are critical in creating an equitable and inclusive lab environment. Obviously, creating opportunities for researchers from historically underrepresented groups is critical to equity; however, it is also critically important to broadly recruit researchers who value contributing to an inclusive research environment.¹ Thus, PIs and others who assess candidates have immense power in shaping a lab's demographics and culture. Recognizing and utilizing this privilege, in addition to understanding and combating your conscious and unconscious biases, can go a long way in impacting a lab.

Importantly, the challenges for creating *productive* and *inclusive* lab groups align: the goal for both is (i) to advertise broadly to ensure a high number of qualified potential researchers apply and (ii) to remove unconscious selection bias in the hiring process such that these highly qualified researchers are hired. Intentionally incorporating these two steps into the recruiting and selection processes aid in the recruitment of a more effective and inclusive research team.²

Pivotaly, by centering intentional recruiting practices and sharing group values and expectations with prospective researchers, you will be a better recruiter. It may be particularly helpful to intentionally establish community guidelines or group expectations prior to recruiting; while there are many ways that this can be accomplished, we prefer the creation of a lab manual to establish community guidelines.^{3,4} Having clear group values will help attract trainees committed to creating and maintaining a productive and inclusive lab environment. The participation of such trainees will reduce the requirement for top-down tone setting and ongoing culture management from the PI. Further, most young researchers today want to join an environment that supports them as both researchers and individuals; making your commitment to this clear during recruitment will make your research environment more attractive to the students who best match your lab's values and your expectations.

It should be noted that recruiting alone is not sufficient to create an inclusive environment. A core challenge of improving a lab environment is that you must recruit trainees who are committed to building a culture that values inclusivity, but it can be hard to recruit them if that environment is not already in place. Further, there is the chance to do real harm to trainees from vulnerable populations if they are recruited without a supportive environment in place.¹ Thus, while we recommend and strongly advocate for the philosophies and practices described herein, we equally strongly advise against implementing these practices in isolation. Both active improvement of the lab culture and improved recruiting and hiring practices should be undertaken simultaneously. Building the ship as you sail it necessitates adjusting course as necessary by being responsive to the everchanging health and morale of the lab group.

Here, we suggest three guiding principles for recruiting and hiring:

- (i) **RECRUITING:** Advertise opportunities broadly and with an open mind
- (ii) **HIRING:** Assess and interact with candidates in a consistent manner that centers your lab's values
- (iii) **ASSESSMENT:** Routinely and systematically evaluate your practices

(i) *RECRUITING: Advertise opportunities broadly and with an open mind*

Rationale. Much of recruiting and advertising happens through word of mouth or other informal channels.⁵ However, waiting for potential researchers to find you creates barriers, which limit who is likely to apply or seriously consider your lab. For example, many undergraduates do not know that research is an opportunity available to them, and they will thus miss informally advertised positions. Additionally, graduate students may choose a research group based on familiarity with the professor, preventing them from joining labs which may be better scientific or culture fits. **Your goal in recruiting and advertising is to be as transparent as possible about opportunities and advertise as broadly as possible.** This increases the number of applicants and improves your chances at identifying the ideal researchers for your lab.

Specific strategies

a. Establish your priorities before advertising positions or starting the recruiting process

Why it matters: Before you begin advertising and hiring, you want to start by thinking carefully about the position's expectations and requirements. It is essential to do this *before* the advertising and application process starts because as soon as you meet candidates, you create opportunities to alter the priorities to match applicants, whether this is intentional or not. Therefore, your goal should be to establish criteria for selecting trainees before meeting any prospective trainees.⁶

How to do it: Ask yourself: does the position require specific technical skills? Are there specific characteristics that you are looking for that you think will be oriented with success? What are your expectations for an applicant for this position? Have unnecessary barriers been used historically that can be removed from the position description?⁷

Next, consider, what are the MOST important skills/characteristics/expectations that you can think of? For each, think carefully: is this necessary for success in the position? When possible, consider being flexible about these requirements as this will increase the size of your applicant pool. Work to try to limit yourself to less than five criteria.

Action items:

- Write down the five (or fewer!) specific skills/characteristics/expectations that you think are most critical for success in the position.
- Consider setting targets that result in measurable change and hold your lab accountable to achieving those quantifiable benchmarks. Use strategies like cluster hiring in highly homogenous settings to help recruit and retain trainees from historically underrepresented groups.¹
- Finally, consider what additional information potential applicants may want: Does the position have set hours? What is the minimum duration of the position? How will it be compensated? (e.g. wages, credit, other employee benefits. For positions with complex compensation scenarios, like postdoctoral researchers, clearly communicate compensation and benefits. Additionally, convey timelines for external funding/fellowship expectations) When is the deadline to reach out/apply? Be prepared to provide this information up front to ensure candidates have adequate information to confidently apply.

b. Advertise intentionally

Why it matters: It is easy, when posting about opportunities, to unintentionally signal to a prospective trainee that they are not welcome. The more that you can use welcoming, inclusive language, the more likely a broader pool of applicants will be interested in your lab.

How to do it: Make sure that your advertisements (both formal and informal) avoid ableist, classist, and gender- or race-biased language. Think carefully about how your advertisement

might be interpreted and how to make it welcoming and appealing to the broadest set of applicants possible.

Action items:

- It can be hard to know what might be discouraging to trainee groups who have different backgrounds than you; we recommend collaborating with your current research group or with other trusted people on the ad to try to think through how the advertisement may be interpreted (and misinterpreted!) by prospective trainees. For example, if your target audience is undergraduates, ask the undergraduates and early-career graduate students to work with you to craft an advertisement that will be encouraging to prospective trainees.
- Include information on your website that answers some common questions from interested trainees and direct them to avenues to approach you for more specific information.

c. Advertise transparently.

Why it matters: Prospective trainees (especially those suffering from imposter syndrome) can assume that they are not qualified or good fits for a given position or lab. By articulating your priorities (from *item a*, above), you can help applicants directly understand if they are a good fit for the position.

How to do it: Be clear in job advertisements what your priorities (from *item a*, above) are and ways in which applicants can meet those priorities. For example, state whether the position is for a lab tech or a student researcher, if it will be paid or for credit, the number of hours they can expect to work a week, the minimum position duration (10-week summer vs 1 semester, etc), the mentoring structure, the application deadline, what skills are required (or not required), etc. For example, if it is an entry position in which experience is not required, training comes with the position, and motivation and curiosity are more important than GPA, say so!

Action items:

- In any advertisement for the position, make sure that you clearly articulate all items from *item a* in the advertisement itself.
- Consider also giving the contact information for current trainees willing to speak with prospective candidates. Include biographies, like their year, how long they have worked in the lab, and a brief description of their work in the lab to date. (Allowing them to mention other extracurriculars, like participation in affinity groups is an easy way to casually share some positionality as well.)

d. Advertise broadly.

Why it matters: One of the biggest barriers to receiving applications is limited reach. This is especially true for younger or first-generation students, who may lack the know-how or network to readily access such opportunities.⁸

How to do it: Now that you have defined the position and what specific elements that you think are necessary for success, advertise broadly. To advertise broadly, post advertisements for the position anywhere that may be suitable. This would include (i) physical posters in buildings and locations where prospective students might go, (ii) in email listservs, (iii) on your website (iv) on social media (v) departmental open house events that are open to all students, (vi) conferences or seminars attended by undergraduate or graduate students seeking their next positions, etc. We recommend asking current trainees where they might observe advertisements for positions.

Action items:

- Choose two feasible locations/methods of advertising that you have not done before.
- Actively recruit from target populations. For example, if you are looking for graduate students, then send an email with information to **all** incoming graduate students. If you are looking for

undergraduate students, consider communicating to specific classes where students with a matching skill/experience level may be.

- Interface with introductory classes and affinity groups (like SACNAS, SHPE, AISES) to explain (i) what research in your department can look like and (ii) what your lab does. This can also be done by current students in the lab.⁹
- Build long-term relationships to collaborate with and recruit from local campuses (like community colleges, minority-serving institutions, and PUIs).⁹⁻¹¹

(ii) HIRING: Assess and interact with candidates in a consistent manner that centers your lab's values

Rationale. Additional biases (often unconscious) are introduced once you begin assessing and interacting with candidate trainees. At this stage, your goal should be to be mindful of implicit bias. If not considering implicit biases, PIs are most likely to hire trainees who have similar backgrounds to themselves or past successful lab members. Even with good intentions, these biases create barriers that prevent labs from recruiting the best candidates, especially candidates from historically underrepresented groups. Therefore, it is worth challenging your mindset of what a promising researcher looks like and questioning your objectivity to better identify when bias may be at play. Think slowly and intentionally to give yourself time to reduce the impact of automatic decision-making and obtain specific information about candidates so you can't automatically fill in the blanks with stereotypes. **Overall, your goal during the selection phase is to minimize bias by focusing your selection on criteria that are most important for success in the position and away from those that contribute to implicit biases.**

Specific strategies

a. Create a rubric and maintain focus on your specific priorities

Why it matters: In the previous section, we recommended beginning from a carefully selected set of priorities. These can be skills, characteristics, and expectations that you feel are tied to high performance in the position. Here, you should again start from that same list of criteria. In this case, use criteria to create a rubric that reflects those priorities.⁶ By creating a rubric that connects to the priorities of your hire, you accomplish two things: (i) You create a hiring process that centers the *abilities* of applicants rather than 'who will fit in' or 'who you like best'. This prevents the recapitulation of existing status quos in academia, making space for researchers from historically underrepresented groups. (ii) This will encourage you to admit students based on skills (which can be acquired in a number of ways) and characteristics (which can be demonstrated in a number of ways) rather than experiences (which disproportionately favor those with access to those experiences).¹²

How to do it: Starting from your list of priorities, create a rubric. We recommend creating one rubric item for each priority. You can discuss this with lab mentors, current trainees, etc. This is a nice opportunity to collaborate with your group in creating a culture that clearly articulates its values. In particular, avoid benchmarks like standardized test scores, the lab or university a student comes from, and the number of conferences they have attended or publications they have written; these are heavily coded with the amount of privilege a student has, including their socioeconomic status and social capital.

Action items:

- Create a rubric for selecting trainees.
- Stick to the rubric! Assess candidates based on the rubric rather than who you feel best about

b. Standardize interactions, especially during interviews

Why it matters: The PI's interactions with prospective trainees can both influence the PI's perceptions of a trainee and influence the prospective trainee's perceptions of the PI (both for good and bad). By standardizing interactions (providing the same information to all candidates, asking identical questions during interviews, ensuring all candidates have equal opportunity to provide critical hiring information), you give all prospective trainees the same opportunity to demonstrate their ability to succeed in the position.

How to do it: Especially during any interviews or initial emails/meetings, standardizing the questions that you ask, the data collection, etc can make sure that your evaluations are less biased and more focused on the applicant's skills and characteristics. Although it may feel awkward or less natural, we recommend that you articulate this to the interviewee that the questions are standardized and that this is being done to minimize bias; this will both put them at ease and demonstrate that inclusive and equitable hiring is a value of the lab.

Action items:

- Create standardized emails. When recruiting graduate students (especially those that undertake rotations, which prolong the "interview" process), curate a set of standardized emails for the following: A) You are accepting rotation students. Describe your lab's priorities (determined above) regarding the expectations of rotation and graduate students, and how they will be evaluated during their rotation. B) You are not accepting graduate students. If possible, give transparency as to why and, if relevant when these circumstances may change. [A) or B) can be pre-emptively provided on a lab's website.] C) That a rotation student has been accepted into your lab, with onboarding information. D) That a rotation student has not been accepted into your lab. Similar sets of emails can be curated for other commonly available positions in the lab, like postdoctoral scholars and other staff.
- Create an interview script. Like a standard operating procedure (SOP), this ensures each interview is highly controlled and repeatable between interviewers. Further, it decreases the role of an interviewer's implicit bias and racial anxiety.¹³ All questions should build out of the priorities. A good rule of thumb is to ask one question for each priority.
- In crafting questions, present the interviewee with multiple ways to satisfy the criteria. In other words, craft questions that *seek to include, rather than exclude candidates*. For example, asking a prospective graduate student "How have you previously communicated a scientific finding to a community?" allows for a wider breadth of demonstrated science communication skills than asking "At which conferences have you previously presented?"
- Set a time limit for the overall interview to give interviewees an idea of how long each answer should be.
- Set aside time at the end of the interview for applicants to ask questions to you.

c. *Actively work to minimize bias during candidate evaluation*

Why it matters: Even a well-designed interview process that centers priorities for the position can be influenced by implicit bias.

How to do it: Do your best to avoid discussing the quality of individual candidates until all applicants have been considered. Avoid making assumptions about a candidate's ability to conform or "feel comfortable" on your team; keep focus on the priorities itemized previously.

Action items:

- Create a systematic scoring system for candidates that rates applicants based on your rubric only.
- If people beyond the PI are involved in decision-making around hiring, discuss how candidates will be evaluated before the application process starts.
- Avoid discussing candidates until all candidates are evaluated.

d. **Prioritize diversity and inclusivity**

Why it matters: If your goal is to create an equitable and inclusive environment through effective hiring, then you should seek to actively and systematically incorporate that into your process.

How to do it: There are many ways to actively incorporate prioritization of diversity into the hiring process. We've previously discussed ways you can emphasize your desire for an inclusive lab environment to applicants. While this may encourage candidates whose values align with yours, making space for them to disclose these shared values can further ensure the recruitment of those willing to foster an inclusive environment.

Action items:

- Review standardized scripts and other distributed language for inclusivity. Attention to diversity and inclusivity is often demonstrated subtly; avoid exploitative statements like, "We are looking to hire diverse trainees." This A) objectifies and tokenizes trainees for their identities and B) incorrectly uses "diverse" as an adjective for a singular person. Communities, like lab groups, can be diverse, individual people are not.
- Consider using applicant diversity statements as part of the application and interview process (Inclusion of these statements has been shown to improve climate at the faculty/department level).
- Prepare yourself for questions candidates are likely to ask, including, "What are my chances for progressing my career here? Do you have formal mentoring and/or career development programs? Are mentors trained to communicate with and manage employees from historically underrepresented groups? What initiatives have you/this program participated in regarding diversity and inclusivity? What formal diversity initiatives and programs are in place in your lab/program?" Even if these questions aren't asked, you may volunteer this information to share your sincerity in welcoming inclusion (but only with information the candidate has shared with you about their identity - never assume!)
- Once your candidate pool is narrowed, revisit applicants from historically underrepresented groups to see if evaluation bias played a part in their exclusion from the shortlist

e. **Consider CUREs or other short-term research projects**

Why it matters: Especially for undergraduates who do not have prior research experience, course-based undergraduate research experiences (CUREs) provide an opportunity to experience research. In addition, they create low-stakes opportunities for young trainees to try out research (or a new research area) and for PIs to evaluate young trainees.

Course-based opportunities that introduce students to research labs can help students gain research experience during a semester-long project, while also building community, fostering faculty relationships, and teaching students skills, including how to identify research misconduct, prepare research proposals, and find a mentor and lab. Many of these course-based opportunities have been described in the literature, and have taken place at a range of institutions, including two-year, four-year PUI, MSI, and R1 universities. Additionally, non-course-based programs, like Terry McGlynn's (Cal State Dominguez Hills) "research recruits," allow students a lower-commitment, short-term opportunity to experience field research abroad and experience a particular lab.¹⁴ While the investment in such programs may be high, its benefits go both ways: students are able to experience research, full-time opportunities, or being away from home for the first time, while the faculty is able to assess student quality and gain a number of qualified, interested students for more long-term projects. These programs increase transparency about what research is and can help students better understand what they're getting themselves into. In addition, these can be excellent opportunities to give older trainees mentoring experience.

How to do it / Action items: There are many books on CUREs, and we recommend you take advantage of these resources!¹⁵⁻¹⁹

(iii) ASSESSMENT: Routinely and systematically evaluate your practices

Rationale. In many ways, this should be the most natural item for an experimental research scientist! Like with any experiment, you should collect data and, carefully and systematically, evaluate whether the experiment is successful (or not). Like any good experiment, the researcher should iterate and continue to improve.

Why it matters: Like in all cases, it's not enough to be neutral, one must actively work against the status quo to achieve any change. An evaluation of your lab's demographics may help assess weak spots and identify areas for improvement. As with implementation of all strategies, one should be careful to minimize any unintended effects. For example, some research has shown that hiring quota strategies may actually change the behaviors of the hiring committee and work against efforts to improve diversity. France enacted a law in 2015 requiring a 60%-40% gender balance in public-university hiring committees, where neither men nor women make up more than 60% of committee members. But, they found that these quotas reduced hiring of women by 38%.²⁰ This is fitting with trends suggesting that mandatory diversity training fails because it activates bias and can cause people to rebel against rules to demonstrate their autonomy.²¹ These consequences, while unintended, still deeply impact researchers, so you should take ownership of any mistakes and readjust course. This agility reaffirms your commitment to your research group, demonstrating your desire to not perpetuate harm on your trainees.

How to do it: These anecdotes demonstrate that efforts must come from a genuine place of caring from all members of the lab environment. Recruiting and hiring conversations could therefore consider means of holding PIs accountable, including by having processes like a "Good Faith Effort Checklist" to ensure steps are being actively taken to recruit a diverse team.²² In a larger effort, institutional studies can be undertaken to investigate how students choose between labs, in a similar fashion as one would think about how students choose between institutions.

Action items:

- Optimize your application and interview process. Have interviewers compare notes: Did multiple interviewees ask similar questions that would benefit from pre-written, standardized answers? Were there interview questions that were unclear to interviewees? Could the rubric be tweaked to capture a wider breadth of candidate qualifications?
- Track applicant demographic data and compare to students in the lab; if there are discrepancies, interrogate why and adjust application process⁶
- Recommendations for nationwide studies suggest tracking applicants from historically underrepresented groups to see which institutions they apply to and choose, and using those trends to identify high-impact recruiting practices.²³ We propose this be implemented at an institution-wide scale to track which labs trainees from historically underrepresented groups apply to and choose. Data can then be used to identify high-impact practices for adoption in other labs.²⁴

As this last action item demonstrates, while faculty can make differences in their own recruitment practices, it is meaningful for change to come at the institutional level to create a system of DEI-conscious recruiting strategies that ensure students have opportunities in the labs and fields of science of their choice. Further, a mindset change among scientists in general has the exciting opportunity to create seamless opportunities for all researchers to succeed throughout their educations and careers.

In our experience, researchers like to assume their 'methodical, logical thinking' as scientists makes us immune to the implicit biases of academia and the world we live in. We argue that being on autopilot instead makes us more prone to stereotypes and biases. This results in stagnant lab demographics and cultures that perpetuate harm towards trainees in vulnerable states of their careers. Here, we propose actionable steps to rethink routine recruitment and hiring practices to prioritize the creation of inclusive environments and the selection of trainees excited to participate in them. These steps are based on a few formative resources and lived experiences, especially Terry McGlynn's blog *Small Pond Science* and other resources cited here.²⁵⁻²⁷ We hope these initial suggestions offer a starting place for discussions about what makes a lab somewhere a trainee can do their best work. Like all good science, we hope labs share results in a collaborative manner, allowing for the propagation of successful practices. As such, we aspire for this content to become outdated, such that successful, empirically driven practices replace those suggested here.

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