Ten simple rules for building an anti-racist lab

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NOTE: This article is written for inclusion in the "Ten Simple Rules" Series published by PLOS Computational Biology. There is a set format of only 10 rules and a title that begins with "Ten Simple Rules…". We adhere to this format recognizing that 10 rules is far from exhaustive and that fostering an anti-racist lab won't always be simple.

ABSTRACT

Demographics of the Science, Technology, Engineering, and Mathematics (STEM) workforce and student body in the U.S. and Europe continue to show severe underrepresentation of Black, Latinx, and Indigenous people. Among the documented causes of the persistent lack of diversity in STEM include bias, discrimination, and harassment of members of underrepresented minority groups (URMs). These issues persist due to continued marginalization, power imbalances, and lack of adequate policies against misconduct in academic and other scientific institutions. All scientists can play important roles in reversing this trend by shifting the culture of academic workplaces to intentionally implement equitable and

inclusive policies, set norms for acceptable workplace conduct, and provide opportunities for mentorship and networking. As scientists are increasingly acknowledging the lack of racial and ethnic diversity in science, there is a need for clear direction on how to take anti-racist action. Here we present 10 rules to help labs develop anti-racists policies and action in an effort to promote racial and ethnic diversity, equity, and inclusion in science.

INTRODUCTION

Racial and ethnic diversity in the Science, Technology, Engineering, and Mathematics (STEM) workforce remains low, particularly at the Ph.D. level and above [1-3]. The May 2020 murder of George Floyd sparked a global uprising against systemic racism and police brutality against Black people [4]. At the same time, racism faced by Christian Cooper while birding in Central Park in New York City demonstrated the danger that Black scientists face in natural spaces, including during scientific fieldwork and while being #BlackInNature [5]. Days later, Black academics began sharing on social media thousands of harrowing stories accounting the racism they face in academic institutions using the hashtag #BlackintheIvory [6]. On June 8, 2020, Black scientists initiated a global strike to eliminate racism and encouraged colleagues to spend the day reading about anti-racism, reflecting on its pervasiveness, and developing anti-racism plans of action [7].

Scientists increasingly acknowledge the problematic lack of racial and ethnic diversity in science and are in search of clear actionable steps they themselves have the power to immediately enact. Professional scientific organizations, universities, and departments all have a role in developing programs and policies that promote racial and ethnic diversity, equity, and

inclusion (DEI). In addition, there are swift actions that research group leaders or primary investigators (PIs) can take to build a lab environment that fosters a racially inclusive environment and ultimately promotes DEI across scientific fields.

Scientists who are beginners to discussions of race, lacking guidance or background knowledge, may adopt unevolved viewpoints or weak policies that unintentionally harm people of color (POC) [8] or contribute to an erosion of trust among people of different racial or ethnic backgrounds in a lab group. Harmful approaches include engaging in objectifying thought experiments that question the instrumental value of POC in science; confusing race as a biological entity as indicated by human genetic variation instead of a socially constructed concept [9]; arguing that the unbiased nature of scientists precludes racial biases in science; and hijacking discussions of race with anecdotes from other types of discrimination (e.g. gender-based, class-based) without employing an intersectional framework [10]. As scientists of color who actively engage in work to promote racial and ethnic DEI, we have encountered all of these harmful scenarios and more.

Building a lab that is anti-racist is very different from building a lab that simply avoids racism. Avoiding racism or stating that one's lab is "not racist" adopts a neutral stance in a struggle that inherently has no neutrality [11]. As the scholar Ibram X. Kendi writes, "One either allows racial inequities to persevere, as a racist, or confronts racial inequities, as an antiracist. There is no in-between safe space of 'not racist.'" [12]. We support recent calls to promote the health and well-being of lab members [13] and supportive lab groups that are resilient to outside stressors [14]. But building an anti-racist lab goes beyond being kind, treating people equally, or taking a color-blind approach. Being anti-racist means developing and supporting

anti-racist policies through ideas and action.

Many current and future PIs are looking for clear advice on how to move beyond statements of solidarity and toward concrete achievable anti-racist action in their labs. We share these 10 rules to contribute to anti-racist STEM discourse and help springboard scientists toward immediate achievable action in realms under their control. It is our hope that partaking in such actions will help lead to improved racial and ethnic diversity and inclusion in the lab and successful scientific lives for all.

Rule 1: Lead informed discussions about anti-racism in your lab regularly

Most PIs would be appalled to learn about members of their lab group being victims of racism. Unfortunately, both overt and covert racist incidents (e.g. microaggressions, tokenism, white savior complex, tone policing, etc.) routinely occur in science labs and go unreported. Unreported racism leads to isolation, anxiety, and stress among POC and can ultimately lead to POCs leaving STEM fields. Part of the responsibility of a PI in creating a safe working environment is developing a lab environment where lab members feel comfortable talking about race and reporting racism, including individual, institutional, or systemic racism in society and especially within academic workplaces [15]. Leading regular discussions on race signals to lab members, POC and white, that racial discrimination is not tolerated and that silence is implicit [16]. PIs should initiate conversations informed by readings and actively moderate them to ensure that privileged individuals do not dominate the conversation and racial and ethnic minorities are heard [17].

Rule 2. Address racism in your lab and field safety guidelines

Racist violence targets POC in the workplace and threatens the ability of students and staff to work safely. Black and Indigenous people of color (BIPOC) are particularly targeted, **even** in academic institutions and at research sites. Lab and field safety guidelines should be written with the recognition that some lab members require additional supports to safely conduct their work. Ask BIPOC lab members what you can do to facilitate their safety on campus and in the field. PIs should advocate for BIPOC lab members who may be harassed or harmed by campus security that think they don't "belong" in academic spaces. In the field, PIs should familiarize themselves with any historical and contemporary racist climate present at field sites and prepare accordingly. Provide POC with safety nets such as easy-to-see identification, official-looking field apparel, or work buddies. An open dialogue about race will encourage POC lab members to speak up about what measures they want or need to ensure their safety.

Rule 3: Publish papers and write grants with BIPOC colleagues

The most important metrics of success in the academy are papers and grants. Publications and grants are also key to tenure, promotion, and/or career longevity in the academic STEM professions. More and more, the most impactful science is done in teams [18], but collaboration networks can be insular. Supportive peer networks in STEM that involve diverse voices produce better quality and highly cited publications [19]. Hence, the most important thing anyone can do to improve the success and retention of BIPOC folx in STEM is to provide opportunities for collaborations that lead to publications and grants. For scientists that

111 work with marginalized communities, it is particularly important to ensure POC are involved in
112 not just manual work but also provide opportunities to make intellectual contributions that
113 lead to publications and further funding. When organizing workshops or symposia, invite
114 scientists of color to co-lead and not just participate.
115
116 **Rule 4: Evaluate your lab's mentoring practices**
117 Building anti-racism into your lab's mentoring strategy begins with the recognition that
118 racial biases, conscious and unconscious, have the potential to taint mentor-mentee
119 relationships and hinder mentee success. POC mentees report racially-motivated gatekeeping
120 behaviors by mentors such as being advised not to pursue advanced degrees or prestigious
121 opportunities, receiving little mentorship in areas associated with issues of identity, tone
122 policing, and being advised to avoid politics (real and perceived) [20]. Increasingly in STEM,
123 multi-mentor models are being favored over one-on-one top-down mentoring relationships to
124 better center mentee needs and career goals [21]. PIs can help mentees build networks of
125 mentors outside of the lab or institution through culturally-relevant professional societies (e.g.
126 SACNAS) or strong online communities (e.g. #BlackandSTEM, #VanguardSTEM) that contribute
127 to a greater sense of agency and confidence and lead to increased academic success. This also
128 encourages lab members to think deeply about their various mentoring needs (e.g. substantive
129 feedback, sponsorship, professional development, emotional support) and take an active role in
130 cultivating their own science networks [22, 23].
131
132 **Rule 5: Amplify voices of BIPOC scientists in your field**

Read papers by BIPOC scientists in your lab group meetings, cite the work of BIPOC scholars, and nominate BIPOC for awards. Social media outlets like Twitter are a good place to identify BIPOC scholars that are in your field but outside of your professional bubble. When amplifying BIPOC voices, ensure to highlight their science achievements and not just their contributions to DEI. For example, if you want a BIPOC scholar to speak about DEI to your group or department, first make sure they have a venue to speak about their science. Even if you have a policy of not compensating speakers for presenting on their scholarly work, consider compensating them for the extra labor of educating your community on DEI initiatives.

Rule 6: Support POC in their efforts to organize

Support the development of safe and brave spaces for POC to organize and discuss issues surrounding race in the absence of white people. For students and trainees, provide meeting space (and additional resources to facilitate effective discussions) where POC can meet and share experiences without fear of retribution. Likewise, support faculty of color in efforts to form separate identity affinity groups within your institution and/or professional organizations. As scholars, we should not forget that our job literally is to educate and mentor the next generation of scholars on how to identify barriers that affect our academic endeavors (including issues related to justice, equity, and inclusion), and come up with plans of actions needed to break down barriers that can prevent us from furthering scientific knowledge.

Rule 7: Intentionally recruit BIPOC students and staff

After working to foster an inclusive, anti-racist lab environment, PIs can begin to

evaluate their lab hiring practices for racial biases. This rule focusing on increasing lab diversity is purposefully placed after the above rules, which prioritize efforts towards inclusion and retention that should be addressed first. In recruitment efforts, do not assume racial or ethnic identity from appearances or names; information should be collected from lab members or applicants in a self-reported and voluntary manner. Many of the same efforts used to improve equity in faculty hiring such as candidate and job ad diversity statements, reaching out personally to promising candidates, and targeting listservs and databases (e.g. DiverseScholar.org) also apply to recruiting BIPOC lab personnel and trainees [24].

Rule 8: Adopt a dynamic research agenda

PIs may be hesitant to hire prospective trainees or staff of color if their research interests do not align closely with the specific research agenda of the lab. A flexible research agenda that accommodates intellectual perspectives outside of the prevailing conversations in one's field could not only help diversify the lab but also lead to more innovative science. URM scholars produce higher rates of scientific novelty, but are also more likely to have their novel contributions discounted and not incorporated into dominant paradigms [25]. PIs, by cultivating dynamic research agendas, can amplify and champion out-of-the-box, innovative contributions from scholars of color.

Rule 9: Advocate for racially diverse leadership in science

Too often, POC are encouraged to participate in the scientific endeavor in purely supportive or subjugative roles. Go beyond mentoring POC scholars in your lab, to sponsoring

them (i.e. talk about them to others) to improve their chances of securing jobs, fellowships, awards, and eventually leadership roles. Efforts to promote racial and ethnic diversity in science must advocate for POC in leadership positions in labs, institutions, professional societies, editorial boards, and funding agencies. Nominate POC for *status elevating* roles in science. Early career scholars working in your group should feel empowered to get involved in leadership and advocacy groups within the university and beyond. If possible, their labor in advocating for leadership that addresses the needs of all members of the research group should be accommodated including with provision of time and resources.

Rule 10: Hold the powerful accountable and don't expect gratitude

The goal of cultivating an anti-racist lab group is to improve a broader system with known racial inequities. Recognize that white scientists are frequently lauded for DEI work while people of color are punished for it [26]. Recognize the difference between performative action and action that doesn't bring personal glory. We should educate ourselves on effective bystander intervention techniques for addressing issues of inequity, harassment, and discrimination. We should also be able to use accountability mechanisms in our own institutions (if we don't have them, work to set them up) and hold our colleagues and ourselves accountable for creating healthy workplace climates. Academics are noted for holding those who mishandle text or data (plagiarize or fabricate data) accountable as we consider these acts to be scientific misconduct. Well, if these constitute misconduct, then mistreating people who do the research should definitely rise to the same level of concern and be considered scientific misconduct too [27].

CONCLUSION

Scientific labs play an important role in confronting the racism that permeates our social institutions and PIs are uniquely positioned to step up and be leaders in confronting this racism in our everyday work environments. Despite the title of this paper, it may not be easy to rectify the long history of racist behaviors and structures that permeate all scientific disciplines [28]. However, as leaders in science, it is our responsibility to take action and simple concrete steps can and must be made toward addressing individual, institutional, and systemic racism. The work in our labs can begin today - no additional committees, focus groups, or surveys are required.

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