

Ten simple rules for building an anti-racist lab

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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, Indigenous, and people of color (BIPOC). 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.

23

24 **INTRODUCTION**

25 Racial and ethnic diversity in the Science, Technology, Engineering, and Mathematics
26 (STEM) workforce remains low, particularly at the Ph.D. level and above [1-3]. The May 2020
27 murder of George Floyd sparked a global uprising against systemic racism and police brutality
28 against Black people [4]. At the same time, racism faced by Christian Cooper while birding in
29 Central Park in New York City demonstrated the danger that Black scientists face in natural
30 spaces, including during scientific fieldwork and while being #BlackInNature [5]. Days later,
31 Black academics began sharing on social media thousands of harrowing stories accounting the
32 racism they face in academic institutions using the hashtag #BlackintheIvory [6]. On June 8,
33 2020, Black scientists initiated a global strike to eliminate racism and encouraged colleagues to
34 spend the day reading about anti-racism, reflecting on its pervasiveness, and developing anti-
35 racism plans of action [7]. These events infused new energy into decades-long efforts working
36 to address racial inequities in STEM [8-10].

37 Scientists increasingly acknowledge the problematic lack of racial and ethnic
38 representation of Black, Indigenous, and people of color (BIPOC) in science and are in search of
39 clear actionable steps they themselves have the power to immediately enact. Professional
40 scientific organizations, universities, and departments all have a role in developing programs
41 and policies that promote racial and ethnic diversity, equity, and inclusion (DEI). In addition,
42 there are swift actions that research group leaders or primary investigators (PIs) can take to
43 build a lab environment that fosters a racially inclusive environment and ultimately promotes
44 DEI across scientific fields.

45 Scientists who are beginners to discussions of race, lacking guidance or background
46 knowledge, may adopt unevolved viewpoints or weak policies that unintentionally harm BIPOC
47 [11] or contribute to an erosion of trust among people of different racial or ethnic backgrounds
48 in a lab group. Harmful approaches include engaging in objectifying thought experiments that
49 question the instrumental value of BIPOC in science; confusing race as a biological entity as
50 indicated by human genetic variation instead of a socially constructed concept [12]; arguing
51 that the unbiased nature of science and scientists precludes racial biases in scientific
52 workplaces; and hijacking discussions of race with anecdotes from other types of discrimination
53 (e.g. gender-based, class-based) without employing an intersectional framework [13]. As
54 scientists of color who actively engage in work to promote racial and ethnic DEI, we have
55 encountered all of these harmful scenarios and more.

56 Building a lab that is anti-racist is very different from building a lab that simply avoids
57 racism. Avoiding racism or stating that one's lab is "not racist" adopts a neutral stance in a
58 struggle that inherently has no neutrality [14]. As the scholar Ibram X. Kendi writes, "One either
59 allows racial inequities to persevere, as a racist, or confronts racial inequities, as an antiracist.
60 There is no in-between safe space of 'not racist.'" [15]. We support recent calls to promote the
61 health and well-being of lab members [16] and supportive lab groups that are resilient to
62 outside stressors [17]. But building an anti-racist lab goes beyond being kind, treating people
63 equally, or taking a color-blind approach. Being anti-racist means developing and supporting
64 anti-racist policies through intentional introspection and subsequent action.

65 Many current and future PIs are looking for clear advice on how to move beyond
66 statements of solidarity and toward concrete achievable anti-racist action in their labs. We

67 share these 10 rules (Figures 1 & 2) to contribute to anti-racist STEM discourse and help
68 springboard scientists toward immediate achievable action in realms under their control. It is
69 our hope that partaking in such actions will help lead to improved racial and ethnic diversity
70 and inclusion in the lab and successful scientific lives for all.

71

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

73 Most PIs would be appalled to learn about members of their lab group being victims of
74 racism. Unfortunately, both overt and covert racist incidents (e.g. microaggressions, tokenism,
75 white savior complex, tone policing, etc.) routinely occur in science labs and go unreported.
76 Unreported racism leads to isolation, anxiety, and stress among BIPOC and can ultimately lead
77 to BIPOCs leaving STEM fields. Part of the responsibility of a PI in creating a safe working
78 environment is developing a lab where lab members feel comfortable talking about race and
79 reporting racism, including individual, institutional, or systemic racism in society and especially
80 within academic workplaces [18]. Leading regular discussions on race informed by scholarly
81 readings signals to lab members, BIPOC and white, that racial discrimination is not tolerated
82 and that silence is implicit acceptance of racism [19]. Initiate a preliminary discussion on
83 promoting anti-racist STEM with lab members and then revisit the topic each term. Discussions
84 can be structured around journal club readings of peer-reviewed literature on equity in STEM,
85 invited DEI speakers, and/or brainstorming sessions to develop anti-racist lab policies. PIs
86 should initiate conversations and actively moderate them to ensure that privileged individuals
87 do not dominate the conversation and racial and ethnic minorities are heard [20].

88

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

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

101

102 **Rule 3: Publish papers and write grants with BIPOC colleagues**

103 The most important metrics of success in the academy are papers and grants.
104 Publications and grants are also key to tenure, promotion, and career longevity in the academic
105 and other STEM professions. More and more, the most impactful science is done in teams [21],
106 but collaboration networks can be insular. Supportive peer networks in STEM that involve
107 diverse voices produce better quality and highly cited publications [22]. Hence, the most
108 important thing anyone can do to improve the success and retention of BIPOC folx in STEM is to
109 provide opportunities for collaborations that lead to publications and grants. For scientists that
110 work with minoritized communities, it is particularly important to ensure BIPOC are involved in

111 not just manual work and/or data entry, but are also provided opportunities to make
112 intellectual contributions that lead to publications and further funding. When organizing
113 workshops or symposia, invite BIPOC scientists to co-lead and not just participate.

114

115 **Rule 4: Evaluate your lab's mentoring practices**

116 Building anti-racism into your lab's mentoring strategy begins with the recognition that
117 racial biases, conscious and unconscious, have the potential to taint mentor-mentee
118 relationships and hinder mentee success. BIPOC mentees report racially-motivated gatekeeping
119 behaviors by mentors such as being advised not to pursue advanced degrees or prestigious
120 opportunities, receiving little mentorship in areas associated with issues of identity, tone
121 policing, and being advised to avoid politics (real and perceived) [23]. Increasingly in STEM,
122 multi-mentor models are being favored over one-on-one top-down mentoring relationships to
123 better center mentee needs and career goals [24]. PIs can help mentees build networks of
124 mentors outside of the lab or institution through culturally-relevant professional societies (e.g.
125 Society for Advancement of Chicanos/Hispanics and Native Americans in Science, the different
126 National Associations/Societies for Black scholars, Black British Professionals in STEM) or strong
127 online communities (e.g. #BlackandSTEM, #VanguardSTEM, #NativeandSTEM, #LatinxandSTEM
128 on Twitter) that contribute to a greater sense of agency and confidence and lead to increased
129 academic success. This also encourages lab members to think deeply about their various
130 mentoring needs (e.g. substantive feedback, sponsorship, professional development, emotional
131 support) and take an active role in cultivating their own science networks [25, 26].

132

133 **Rule 5: Amplify voices of BIPOC scientists in your field**

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

142

143 **Rule 6: Support BIPOC in their efforts to organize**

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

153

154 **Rule 7: Intentionally recruit BIPOC students and staff**

155 After working to foster an inclusive, anti-racist lab environment, PIs can begin to
156 evaluate their lab hiring practices for racial or ethnic biases. This rule focusing on increasing lab
157 diversity is purposefully placed after the above rules, which prioritize efforts towards inclusion
158 and retention that should be addressed first. Developing programs for support and retention
159 first helps ensure that BIPOC are not recruited into toxic environments. In recruitment efforts,
160 do not assume racial or ethnic identity from appearances or names; information should be
161 collected from lab members or applicants in a self-reported and voluntary manner. Many of the
162 same efforts used to improve equity in faculty hiring such as candidate and job ad diversity
163 statements, targeted recruitment of promising candidates, and targeting listservs and
164 databases (e.g. DiverseScholar.org) also apply to recruiting BIPOC lab personnel and trainees
165 [27]. Along with recruiting, PIs can advocate for targeted retention and inclusion initiatives at
166 the department or university level, such as a cohort or cluster approach to diversify STEM
167 student and/or faculty hiring [28, 29].

168

169 **Rule 8: Adopt a dynamic research agenda**

170 PIs may be hesitant to hire prospective BIPOC trainees or staff if their research interests
171 do not align closely with the specific research agenda of the lab. A flexible research agenda that
172 accommodates intellectual perspectives outside of the prevailing conversations in one’s field
173 could not only help diversify the lab but also lead to more innovative science. URM scholars
174 produce higher rates of scientific novelty, but are also more likely to have their novel
175 contributions discounted and not incorporated into dominant paradigms [30]. PIs, by cultivating
176 dynamic research agendas, can amplify and champion out-of-the-box, innovative contributions

177 from BIPOC scholars.

178

179 **Rule 9: Advocate for racially diverse leadership in science**

180 Too often, BIPOC are encouraged to participate in the scientific endeavor in purely
181 supportive or subjugative roles. Go beyond mentoring BIPOC scholars in your lab, to sponsoring
182 them (i.e. talk about them to others) to improve their chances of securing jobs, fellowships,
183 awards, and eventually leadership roles. Efforts to promote racial and ethnic diversity in science
184 must advocate for BIPOC in leadership positions in labs, institutions, professional societies,
185 editorial boards, and funding agencies. Nominate BIPOC for *status elevating* roles in science.
186 Early career scholars working in your group should feel empowered to get involved in
187 leadership and advocacy groups within the university and beyond. If possible, their labor in
188 advocating for leadership that addresses the needs of all members of the research group
189 should be accommodated including with provision of time and resources.

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

191 The goal of cultivating an anti-racist lab group is to improve a broader system with
192 known racial inequities. Recognize that white scientists are frequently lauded for DEI work
193 while BIPOC are punished for it [31]. Recognize the difference between performative action and
194 action that doesn't bring personal glory. We should educate ourselves on effective bystander
195 intervention techniques for addressing issues of inequity, harassment, and discrimination. We
196 should also be able to use accountability mechanisms in our own institutions (if we don't have
197 them, work to set them up) and hold our colleagues and ourselves accountable for creating
198 healthy workplace climates. Academics are noted for holding those who mishandle text or data

199 (plagiarize or fabricate data) accountable as we consider these acts to be scientific misconduct.
200 Well, if these constitute misconduct, then mistreating people who do the research should
201 definitely rise to the same level of concern and be considered scientific misconduct too [32].

202

203 **CONCLUSION**

204 Scientific labs play an important role in confronting the racism that permeates our social
205 institutions and PIs are uniquely positioned to step up and be leaders in confronting this racism
206 in our everyday work environments. Despite the title of this paper, it may not be easy to rectify
207 the long history of racist behaviors and structures that permeate all scientific disciplines [33].
208 However, as leaders in science, it is our responsibility to take action and simple concrete steps
209 can and must be made toward addressing individual, institutional, and systemic racism. The
210 work in our labs can begin today - no additional committees, focus groups, or surveys are
211 required.

212

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217

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297 Figure 1. Ten simple rules for building and anti-racist lab poster to facilitate communication in
298 science workplaces.
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Ten simple rules for building an anti-racist lab

From Chaudhary and Berhe 2020

1. Lead informed discussions about anti-racism in your lab regularly
2. Address racism in your lab and field safety guidelines
3. Publish papers and write grants with BIPOC colleagues
4. Evaluate your lab's mentoring practices
5. Amplify voices of BIPOC scientists in your field
6. Support BIPOC in their efforts to organize
7. Intentionally recruit BIPOC students and staff
8. Adopt a dynamic research agenda
9. Advocate for racially diverse leadership in science
10. Hold the powerful accountable and don't expect gratitude

Glossary

Anti-racist: Beliefs, actions, or policies that promote the idea that people of different races and ethnicities are equal.

BIPOC: Black, Indigenous, and People of Color. An inclusive term for people of color meant to center the unique experiences of Black and Indigenous people and underscore the diversity among racial/ethnic minority groups.

Folx: A gender-neutral variation of the word folks, colloquially used to signal the inclusion of people with different gender identities.

Microaggression: A comment or action that subtly and often unconsciously expresses a prejudiced attitude toward a member of a minoritized group (such as BIPOC).

Minoritized: A term used to highlight underrepresented minority (URM) groups, in particular when a group is pushed to the margins by actions outside their control. Groups considered minoritized in STEM vary widely depending on discipline.

Tokenism: The act of making only a symbolic effort to be equitable for or inclusive of minoritized groups by including a small number of people purely to deflect accusations of discrimination.

Race: A social classification system that emerged from, and in support of, European colonialism, oppression, and discrimination with no roots in human biological variation.

Racism: Prejudice against someone because of their race in the context of a belief in the inherent superiority and inferiority of different racial groups, which is reinforced by institutional and historical structures.

Tone-policing: Attacking the tone or perceived emotion in which a statement is made thereby detracting from the validity of the statement.

White savior complex: The belief that white people are destined to help BIPOC, often in a patronizing or self-serving manner.