

COMMENTARY

Responding and navigating racialized microaggressions in STEM

Andrea Marshall^{1,†}, Angela D. Pack^{2,†}, Sarah Afua Owusu^{3,†}, Rainbo Hultman^{4,5}, David Drake⁶, Florentine U. N. Rutaganira⁷, Maria Namwanje⁸, Chantell S. Evans⁹, Edgar Garza-Lopez^{10,11}, Samantha C. Lewis⁷, Christina M. Termini^{12,‡}, Salma AshShareef^{13,14}, Innes Hicsasmaz^{13,14}, Brittany Taylor¹⁵, Melanie R. McReynolds^{16,17}, Haysetta Shuler^{18,*} and Antentor O. Hinton, Jr^{1,11,*}

¹Department of Molecular Physiology and Biophysics, Vanderbilt University, Nashville, TN, USA, ²Department of Microbiology and Immunology, University of Iowa, Iowa City, IA, USA, ³Department of Surgery, Surgical Therapeutic Advancement Center, University of Virginia Health System, Charlottesville, VA, USA, ⁴Department of Molecular Physiology and Biophysics, University of Iowa, Iowa City, IA, USA, ⁵Iowa Neuroscience Institute, University of Iowa, Iowa City, IA, USA, ⁶Department of Endodontics, University of Iowa, Iowa City, IA, USA, ⁷Department of Molecular and Cell Biology, University of California, Berkeley, Berkeley, CA, USA, ⁸Division of Pediatric Genetics, University of Tennessee Health Science Center, Memphis, TN, USA, ⁹Department of Physiology, University of Pennsylvania, Philadelphia, PA, USA, ¹⁰Department of Microbial Pathogens and Immunity, Rush University, Chicago, IL, USA, ¹¹Hinton and Garza Lopez Family Consulting Company, Iowa City, IA, USA, ¹²Department of Orthopaedic Surgery, University of California, Los Angeles, Los Angeles, CA, USA, ¹³Department of Internal Medicine, University of Iowa, Iowa City, IA, USA, ¹⁴Fraternal Order of Eagles Diabetes Research Center, University of Iowa, Iowa City, IA, USA, ¹⁵Biomedical Engineering Department, University of Florida, Gainesville, FL, USA, ¹⁶Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, USA, ¹⁷Department of Chemistry, Princeton University, Princeton, NJ, USA and ¹⁸Department of Biological Sciences, 601 South Martin Luther King Drive, WBA Science Building, room 217, Winston-Salem, NC 27110, USA

*Corresponding author: Department of Biological Sciences, 601 South Martin Luther King Drive, WBA Science Building, room 217, Winston-Salem, NC, 27110, USA. Tel: 3193833095; E-mail: shulerh@wssu.edu; Department of Molecular Physiology and Biophysics, 750 Robinson Research Building, 2200 Pierce Ave, Nashville, TN 37232-0615, USA. Tel: 319-383-3095; E-mail: antentor.o.hinton.jr@Vanderbilt.Edu

One sentence summary: This article focuses on how mentors can be allies against microaggressions in STEM.

[†]Denotes co-First Author

^{*}Denotes co-Senior Author, Haysetta Shuler and Antentor Hinton, Jr.

Editor: Alfredo Garzino-Demo

[‡]Christina M. Termini, <http://orcid.org/0000-0002-1831-1347>

Received: 21 April 2021; Accepted: 10 May 2021

© The Author(s) 2021. Published by Oxford University Press on behalf of FEMS. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

ABSTRACT

While it is commonly thought that microaggressions are isolated incidents, microaggressions are ingrained throughout the academic research institution (Young, Anderson and Stewart 2015; Lee et al. 2020). Persons Excluded from science because of Ethnicity and Race (PEERs) frequently experience microaggressions from various academicians, including graduate students, postdocs and faculty (Asai 2020; Lee et al. 2020). Here, we elaborate on a rationale for concrete actions to cope with and diminish acts of microaggressions that may otherwise hinder the inclusion of PEERs. We encourage Science, Technology, Engineering and Mathematics (STEM) departments and leadership to affirm PEER scholar identities and promote allyship by infusing sensitivity, responsiveness and anti-bias awareness.

Keywords: microaggressions; STEM; environmental microaggressions; microinvalidations; microinsults; microassaults

INTRODUCTION

The road to obtaining an advanced scientific degree is rigorous, demanding, and at times consuming. While stress contributes to high anxiety and burnout among scientists, PEERs also face racialized microaggressions throughout their careers (Asai 2020). In the 1970s, Harvard psychiatrist Dr. Chester M. Pierce coined the term ‘microaggression’ to describe the everyday *verbal and nonverbal* acts of systemic racism that demean and undermine Black Americans. Microaggressions include intentional, or unintentional, statements and actions that encourage indirect, subtle, or careless discrimination against members of a marginalized group (Pierce 1974; Sue et al. 2007). Other classes of microaggressions include environmental microaggressions, microinvalidations, microinsults, and microassaults (Fig. 1) (Sue et al. 2007). Research suggests that microaggressions may increase levels of salivary cortisol, a primary stress hormone that directly contributes to feelings of emotional distress and anxiety (Richman and Jonassaint 2008; Zeiders et al. 2018). Microaggressions may disproportionately affect PEER scholars and result in lower academic performance, focus, task management, and struggles with personal identity (Allen, Scott and Lewis 2013; Whittaker, Montgomery and Acosta 2015; Moragne-Patterson and Barnett 2017; Espaillat et al. 2019; Lambert et al. 2020). While this piece is focused on the experience of PEERs in STEM, we acknowledge that scientists from other background also experience microaggressions.

Macroaggressions are overt aggressions that encourage intentional discrimination (Donovan et al. 2012). Like microaggressions, macroaggressions are frequently experienced by PEERs. Although less common, perceived macroaggressions are detrimental to mental health and may have a lasting negative impact on PEERs’ academic experience. The blueprint for addressing racialized aggressions is still lacking. Here, we recommend actions to reduce racialized microaggressions within the STEM workforce (Geoffroy and Chamberland 2015; Osseo-Asare et al. 2018; Duma et al. 2019; Khan, Taylor and Rialon 2019; Serafini et al. 2020; Fisher 2021).

Common microaggressions

PEER scientists frequently experience imposter syndrome—the feeling that one lacks capacity or does not belong despite their qualifications and capabilities (Hinton Jr et al. 2020a; Hinton Jr et al. 2020b). Imposter syndrome may coincide with stereotype threat, a situational quandary in which people are, or perceive to, comply with stereotypes about their social group (Steele 1995; Schmader 2008; Pennington et al. 2016). The intensity of imposter syndrome and stereotype threat among PEERs is

disproportionately higher than their non-PEER colleagues. These issues are thought to influence the long-standing racial and gender gaps in academic performance (Steele 1995; Schmader 2008; Pennington et al. 2016). To combat this systemic barrier, we encourage an increased awareness of racialized aggressions faced by PEER scientists.

Environmental microaggressions

Workplace microaggressions are a form of environmental microaggressions (Sue et al. 2007). In the United States, the scarcity of PEER scholars in STEM sends a message that PEERs are not welcome in STEM (Asai 2020). Notably, one example of an environmental microaggression would be a university estate that only has buildings named after one ethnicity. Often, these types of insults are commonplace within shared laboratory and meeting spaces, leading to psychological stress that impacts PEER scholar performance. Thus, we believe it is important for mentors to be aware of environmental aggressions, which affect racial or ethnic groups as a whole (Termini et al. 2021a; Termini et al. 2021b).

Microinvalidations

Microinvalidations are interactions that exclude, negate, or nullify a marginalized person’s thoughts, feelings, or experiences (Sue et al. 2007). An example of a microinvalidation would be an individual of one ethnicity telling another ethnicity that ‘racism does not occur in today’s world.’ Additionally, microinvalidations occur in academia when the published work of PEER and women scholars are undercited and not recognized at conferences (Chakravarty et al. 2018; Bertolero et al. 2020; Kibbe and Kapadia 2020; Zurn, Bassett and Rust 2020). This contributes to the challenges PEER scholars face in obtaining grants and recognition in their fields. To combat these injustices, we believe PEER scholars merit increased opportunities to present their research at national and international meetings and deserve equity in scholarly citation.

Microinsults

Microinsults are unconscious insults that demean a marginalized person’s heritage or identity (Sue et al. 2007). A common scenario encountered by PEERs, especially those that are non-native English speakers, is the expression of surprise from majority colleagues regarding a PEER’s ability to articulate arguments and ideas. For instance, ‘Your presentation was *actually* good! You spoke so clearly,’ or ‘You must have attended an elite institution to speak English so well.’ While intended as a compliment, such commentary is rooted in the misconception that PEERs

Microaggressions faced by PEERs in STEM

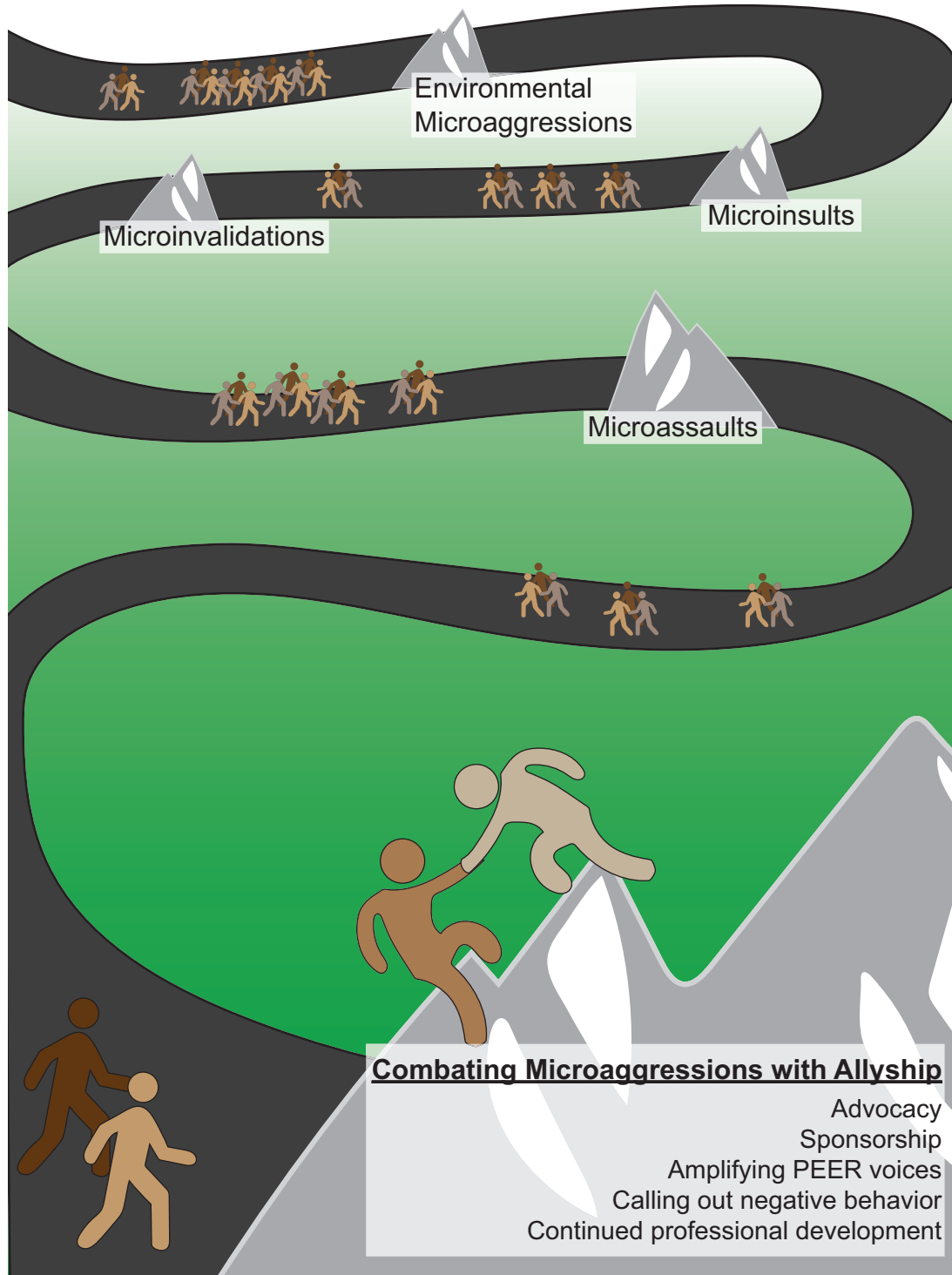


Figure 1. The Road to Understanding Microaggressions and Macroaggressions. The cartoon depicts the types of microaggressions (environmental microaggressions, microinvalidations, microinsults and microassaults) and macroaggressions that happen in academia. The cartoon also depicts mentors using allyship to assist in the fight against microaggressions.

are inferior verbal communicators. These comments perpetuate the stereotype that PEERs, who are proficient in English, are an anomaly.

Inappropriately addressing a PEER scientist in an academic environment sends a message that the PEER scholar is not qualified. This mistake may appear harmless and unintentional, but repeated microinvalidations over many meetings, scientific conferences, or professional events cultivate a sense of otherness (Gibbs Jr, McGready and Griffin 2015; Whittaker, Montgomery and Acosta 2015; Lambert et al. 2020). Ultimately, such microaggressions diminish the socioemotional well-being of PEERs in a manner that negatively impacts their work (Miles, Brockman and Naphan-Kingery 2020).

Microassaults

Microassaults are intentional verbal and nonverbal attacks that include name-calling and avoidant or purposeful discriminatory actions (Sue et al. 2007; Sue 2010). These microaggressions are often conscious and meant to hurt the intended victim. Publicly correcting the enunciation of a PEER colleague in a formal context where feedback is not the norm is an example of a microassault. While communication is a part of scientific training, public correction of grammar, accents, and dialects can provoke negative attention and embarrassment for the PEER scholar. Publicly or privately deriding a PEER's thought process creates an environment that takes away from their identity and emphasizes perfection whereas their counterparts are allowed to make mistakes (Kutten 2020). Microassaults can also decrease PEER performance and undermine individuality (Montgomery and Montgomery 2012; Whittaker and Montgomery 2012). PEERs may cope with negative attention and embarrassment by code-switching, the linguistic practice of altering between language varieties in a conversation (Nilep 2006; Young et al. 2018). Continuous microassaults may decrease the capacity of PEERs to be authentically themselves and negatively impact their perception of self-worth (Morton, Gee and Woodson 2019).

Combating microaggressions with allyship

The impact of micro- and macroaggressions experienced by PEERs can be lessened through allyship (Hayes 2010; Whittaker and Montgomery 2012; Johnson et al. 2019; Edwards et al. 2020). Allyship is an active process of unlearning and reevaluating negative perceptions of PEERs to increase inclusivity within the STEM community (Johnson et al. 2019). We believe true allyship creates spaces where PEERs' consciousness can be fully awakened to promote scientific innovation (Termini et al. 2021a; McGee 2016). Below, we discuss specific steps to promote allyship and support PEER scholars in the STEM pipeline. We highlight the importance of being an advocate and sponsor, amplifying the voices of PEERs, calling out negative behavior, and continuing professional development.

Allyship for PEER trainees

Establishing a career in science requires adequate mentorship; PEER graduate student mentors can also be allies (Hinton Jr et al. 2020b; Termini et al. 2021a; Termini et al. 2021b; Allen-Ramdiel and Campbell 2014; National Academies of Sciences and Medicine 2019). As an ally, we recommend engaging in professional and career development training opportunities that specifically focus on how to be an intentional ally. This partnership may open doors for graduate students by providing them with opportunities to present their science and network with leaders in their respective fields (Montgomery 2020). Allies can

call attention to microaggressions experienced by PEER graduate scholars themselves or create atmospheres where the 'The Ouch Rule' is used (Ruiz-Mesa and Hunter 2019). 'Ouch' is stated when an offensive comment is made and 'oops' is the apologetic response, this rhetoric provides an opportunity to discuss the microaggression in real-time. Often, these situations result from an imbalanced power structure where PEER scholars feel uncomfortable advocating for themselves (Essed 1991; Bonilla-Silva 2006; Cooke, Patt and Prabhu 2017; Drigas and Papoutsis 2018; Phillips and Lowery 2018). To lessen encounters that result in microaggressions, we encourage partnerships with diversity, equity, and inclusion (DEI) or graduate studies offices to provide allyship training and host discussions on the development and maintenance of diverse work environments.

The trainee phase can be an optimal stage to develop allyship and cultural awareness skills through training, teaching, career, and professional development. In our experience, many PEERs encounter micro- or macroaggression in the classroom, making teaching a relevant avenue to explore allyship. Cultural competence training may be a method to provide PEER allies with the knowledge to identify and address systemic inequalities in resources and power structure. Although there is no foolproof way to create a culturally embracing environment, we encourage allies to cultivate an inclusive space to reach a critical mass, thereby improving dynamic of diversity efforts and impeding performative actions (Oliver 2013; Garces and Jayakumar 2014). Advocating for trainees by bringing awareness to the challenges faced by marginalized populations not only benefits PEERs but the academic community as a whole.

Postdocs must also have opportunities to establish themselves as independent scientists. Giving seminars at research conferences and participating in grant writing activities are two ways for trainees to advance their careers. We encourage allies to amplify the voices of PEER postdocs by nominating them for invited seminars, ad-hoc reviewers, and transitional awards. Additionally, allies can provide resources for PEERs to engage in career development workshops, including how to manage relationships and build networks.

We encourage allies of PEER trainees to learn and practice valued-based mentoring. Importantly, allies should acknowledge PEER individuality and personalize the mentoring relationship to match the PEER's goals. In being an effective ally, faculty and trainees should develop agreed-upon strategies that work for their cultures, learning styles, and core values. By developing this rapport, PEER trainees can navigate imposter syndrome and gain scientific confidence (Hinton Jr et al. 2020b). Like most effective allyship, value-based mentoring requires a willingness to commit time and effort and nurtures a partnership between PEER trainees and allies. We believe that value-based mentoring will foster a sense of belonging that may facilitate PEER trainee transition to the faculty phase.

Enrichment of Faculty Allyship

Since allyship is a continued effort, support for PEERs should not stop when they become faculty. Faculty should amplify the voices of their pre-tenure PEER colleagues. Tenured faculty may leverage their seniority and job security to help influence departmental and institutional decisions that enable PEER faculty advancement—for example, providing support for junior colleagues who actively engage in innovating and revitalizing DEI work. Marginalized faculty disproportionately carry the weight of equity-focused service and leadership and face environments that devalue diversity issues and advocacy efforts. In these environments, PEER faculty may be encouraged to 'focus

on the science,' which can be perceived by the PEER as dismissive of their aspirations (Social Sciences Feminist Network Research Interest 2017). Therefore, senior-level allies should invest their time and balance the service load required to rectify institutional inequities. We believe that tenured faculty can serve important roles in setting precedents that create broader institutional change that facilitates opportunities for PEERs, such as compensating DEI efforts, providing funding for DEI work, and rewarding excellence in DEI for tenure and promotion.

CONCLUSION

Microaggressions create obstacles in the academic pipeline, which disproportionately limit PEER performance. In this piece, we provided an overview of several challenges PEERs face in academia. To safeguard the physical and emotional well-being of PEER trainees, it is imperative to equip STEM allies with tools to combat discrimination. We specifically highlight the importance of value-based mentoring, sponsorship, and amplifying the voices of PEER scholars as an integral part of allyship (Termini et al. 2021a; Termini et al. 2021b). PEERs are a part of the scientific community; their life experiences mold them into the scientists they are today. Unfortunately, the current mold of the academy is not flexible enough to effectively include PEER experiences and enable them to reach their full potential. Diversity in the pipeline promotes scientific innovation (Allen-Ramdial and Campbell 2014; Hinton Jr et al. 2020a; Hinton Jr et al. 2020b; National Academies of Sciences and Medicine 2019). Microaggressions may inhibit critical PEER viewpoints that are currently excluded, which may hinder scientific innovation. Taken together, allies and PEER scientists can build the mechanisms that will heal the scientific community from aggression in person and virtually (McReynolds et al. 2020).

REFERENCES

- Allen-Ramdial SA, Campbell AG. Reimagining the Pipeline: advancing STEM Diversity, Persistence, and Success. *Bio-science* 2014;64:612–8.
- Allen A, Scott LM, Lewis CW. Racial microaggressions and African American and Hispanic students in urban schools: a call for culturally affirming education. *Interdisciplinary Journal of Teaching and Learning* 2013;3:117–29.
- Asai DJ. Race matters. *Cell* 2020;181:754–7.
- Bertolero MA, Dworkin JD, David SU et al. Racial and ethnic imbalance in neuroscience reference lists and intersections with gender. *BioRxiv* 2020.
- Bonilla-Silva E. *Racism without racists: Color-blind racism and the persistence of racial inequality in the United States*: Rowman & Littlefield Publishers, 2006.
- Chakravartty P, Kuo R, Grubbs V et al. #CommunicationSoWhite. *J Commun* 2018;68:254–66.
- Cooke KJ, Patt DA, Prabhu RS. The road of mentorship. *American Society of Clinical Oncology Educational Book* 2017;37:788–92.
- Donovan RA, Galban DJ, Grace RK et al. Impact of Racial Macro- and Microaggressions in Black Women's Lives: a Preliminary Analysis. *Journal of Black Psychology* 2012;39:185–96.
- Drigas AS, Papoutsis C. A new layered model on emotional intelligence. *Behavioral Sciences* 2018;8:45.
- Duma N, Maingi S, Tap WD et al. Establishing a mutually respectful environment in the workplace: a toolbox for performance excellence. *American Society of Clinical Oncology Educational Book* 2019;39:e219–e26.
- Edwards M, Johnson MD, Fernandez RW et al. Mentoring to Foster a Diverse Future. *Cell* 2020;183:561–3.
- Espallat A, Panna DK, Goede DL et al. An exploratory study on microaggressions in medical school: what are they and why should we care? *Perspectives on medical education* 2019;8:143–51.
- Essed P. *Understanding everyday racism: An interdisciplinary theory volume 2*: Sage, 1991.
- Fisher B. Leadership lessons from a year of Covid-19. *Forbes*, 2021.
- Garces LM, Jayakumar UM. Dynamic Diversity: toward a Contextual Understanding of Critical Mass. *Educational Researcher* 2014;43:115–24.
- Geoffroy M, Chamberland L. Discrimination des minorités sexuelles et de genre au travail: quelles implications pour la santé mentale? *Santé mentale au Québec* 2015;40:145–72.
- Gibbs Jr KD, McGready J, Griffin K. Career development among American biomedical postdocs. *CBE—Life Sciences Education* 2015;14:ar44.
- Hayes TB. Diversifying the biological sciences: past efforts and future challenges. *Mol Biol Cell* 2010;21:3767–9.
- Hinton AO, Jr, Termini CM, Spencer EC et al. Patching the Leaks: revitalizing and Reimagining the STEM Pipeline. *Cell* 2020a;183:568–75.
- Hinton Jr AO, Vue Z, Termini CM et al. Mentoring minority trainees: minorities in academia face specific challenges that mentors should address to instill confidence. *EMBO Rep* 2020b;21:e51269.
- Johnson IR, Pietri ES, Fullilove F et al. Exploring identity-safety cues and allyship among black women students in STEM environments. *Psychology of Women Quarterly* 2019;43:131–50.
- Khan NR, Taylor CM, II, Rialon KL. Resident Perspectives on the Current State of Diversity in Graduate Medical Education. *Journal of Graduate Medical Education* 2019;11:241.
- Kibbe MR, Kapadia MR. Underrepresentation of Women at Academic Medical Conferences—“Manels” Must Stop. *JAMA Network Open* 2020;3:e2018676–e.
- Kutten SN. #AdultingWhileBlack: encountering in the Campus Climate and the Formation of Racialized Adult Identity among Traditional-Age Black College Students. 2020.
- Lambert WM, Wells MT, Cipriano MF et al. Research Culture: career choices of underrepresented and female postdocs in the biomedical sciences. *Elife* 2020;9:e48774.
- Lee MJ, Collins JD, Harwood SA et al. “If you aren’t White, Asian or Indian, you aren’t an engineer”: racial microaggressions in STEM education. *International Journal of STEM Education* 2020;7:1–16.
- McGee EO. Devalued Black and Latino Racial Identities: a By-Product of STEM College Culture? *Am Educ Res J* 2016;53:1626–62.
- McReynolds MR, Termini CM, Hinton AO et al. The art of virtual mentoring in the twenty-first century for STEM majors and beyond. *Nat Biotechnol* 2020;38:1477–82.
- Miles ML, Brockman AJ, Naphan-Kingery DE. Invalidated identities: the disconfirming effects of racial microaggressions on Black doctoral students in STEM. *Journal of Research in Science Teaching* 2020;57:1608–31.
- Montgomery BL. Academic leadership: gatekeeping or groundskeeping? *Journal of Values-Based Leadership* 2020;13:16.

- Montgomery R, Montgomery BL. Graduation Rates at Historically Black Colleges and Universities: an Underperforming Performance Measure for Determining Institutional Funding Policies. *The Journal of Continuing Higher Education* 2012;**60**:93–109.
- Moragne-Patterson YK, Barnett TM. Experiences and responses to microaggressions on historically White campuses: a qualitative interpretive meta-synthesis. *J Soc & Soc Welfare* 2017;**44**:3.
- Morton TR, Gee DS, Woodson AN. Being vs. Becoming: transcending STEM Identity Development through Afropessimism, Moving toward a Black X Consciousness in STEM. *The Journal of Negro Education* 2019;**88**:327–42.
- National Academies of Sciences E, Medicine. *The Science of Effective Mentorship in STEMM*, DOI: 10.17226/25568. Washington, DC: The National Academies Press, 2019.
- Nilep C. “Code switching” in sociocultural linguistics. *Colorado research in linguistics* 2006;**19**.
- Oliver P. Critical Mass Theory. *The Wiley-Blackwell Encyclopedia of Social and Political Movements*, DOI: <https://doi.org/10.1002/9780470674871.wbespm059>, 2013.
- Osseo-Asare A, Balasuriya L, Huot SJ et al. Minority resident physicians’ views on the role of race/ethnicity in their training experiences in the workplace. *JAMA network open* 2018;**1**:e182723–e.
- Pennington CR, Heim D, Levy AR et al. Twenty years of stereotype threat research: a review of psychological mediators. *PLoS One* 2016;**11**:e0146487.
- Phillips LT, Lowery BS. Herd invisibility: the psychology of racial privilege. *Curr Dir Psychol Sci* 2018;**27**:156–62.
- Pierce C. *Psychiatric problems of the Black minority*. American handbook of psychiatry, New York: Basic Books, 1974.
- Richman LS, Jonassaint C. The effects of race-related stress on cortisol reactivity in the laboratory: implications of the Duke lacrosse scandal. *Ann Behav Med* 2008;**35**:105–10.
- Ruiz-Mesa K, Hunter KM. Best practices for facilitating difficult dialogues in the basic communication course. *Journal of Communication Pedagogy* 2019;**2**:23.
- Schmader T. An integrated process model of stereotype threat effects on performance. *Psychol Rev* 2008;**115**:336–56.
- Serafini K, Coyer C, Speights JB et al. Racism as experienced by physicians of color in the health care setting. *Fam Med* 2020;**52**:282–7.
- Social Sciences Feminist Network Research Interest G. The Burden of Invisible Work in Academia Social Inequalities and Time Use in Five University Departments. *Humboldt Journal of Social Relations* 2017;**39**: 228–45.
- Steele CM, Aronson. Stereotype threat and the intellectual test performance of African Americans. *J Pers Soc Psychol* 1995;**69**:797–811.
- Sue DW, Capodilupo CM, Torino GC et al. Racial microaggressions in everyday life: implications for clinical practice. *Am Psychol* 2007;**62**:271.
- Sue DW. *Microaggressions in everyday life: Race, gender, and sexual orientation*. John Wiley & Sons, 2010.
- Termini CM, Hinton AO, Jr, Garza-López E et al. Building Diverse Mentoring Networks that Transcend Boundaries in Cancer Research. *Trends Cancer* 2021a;**7**.
- Termini CM, McReynolds MR, Rutaganira FU et al. Mentoring during Uncertain Times. *Trends Biochem Sci* 2021b;**46**.
- Whittaker JA, Montgomery BL, Acosta VGM. Retention of underrepresented minority faculty: strategic initiatives for institutional value proposition based on perspectives from a range of academic institutions. *Journal of Undergraduate Neuroscience Education* 2015;**13**: A136.
- Whittaker JA, Montgomery BL. Cultivating diversity and competency in STEM: challenges and remedies for removing virtual barriers to constructing diverse higher education communities of success. *Journal of Undergraduate Neuroscience Education* 2012;**11**:A44.
- Young K, Anderson M, Stewart S. Hierarchical microaggressions in higher education. *Journal of Diversity in Higher Education* 2015;**8**:61–71.
- Young VA, Barrett R, Young-Rivera YS et al. *Other People’s English: code-Meshing, Code-Switching, and African American Literacy*, 2018.
- Zeiders KH, Landor AM, Flores M et al. Microaggressions and diurnal cortisol: examining within-person associations among African-American and Latino young adults. *J Adolesc Health* 2018;**63**:482–8.
- Zurn P, Bassett DS, Rust NC. The citation diversity statement: a practice of transparency, a way of life. *Trends Cogn Sci* 2020;**24**:669–72.