The Biophysicist

Empowering Women in Biomedical Engineering: A Departmental Pathway to Inclusion and Support

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ABSTRACT   The underrepresentation of women in science, technology, engineering, and mathematics (STEM) fields, including biomedical engineering, remains a persistent challenge and emphasizes the need for initiatives that attract and retain more women in the field. Such initiatives should address this gender imbalance and aim to harness the diverse perspectives and talents of all genders. Women in engineering face unique challenges due to the field's male-dominated nature. Gender bias, stereotypes, and family-unfriendly expectations can significantly affect women's experiences, hindering their opportunities for recognition and career advancement. A 2021 survey of the Biomedical Engineering Department and Graduate Group at the University of California Davis revealed that women and marginalized individuals experience a different sense of belonging compared with their white male counterparts, frequently encounter challenges related to implicit bias, microaggressions, and a lack of adequate support, mentorship, and opportunities for professional development. Here, we describe and reflect on the efforts by the Biomedical Engineering Health, Equity, and Wellness Committee to begin to address these challenges. We launched the Women$^+$ in Biomedical Engineering Lunch Series, which provides a platform for women, marginalized individuals, and their allies to come together, connect, and share experiences. The lunch series aims to facilitate open dialogue, mentorship, and support and promote networking opportunities to bridge the gender gap in the field. The initial meetings in the Spring quarter of 2023 focused on key topics such as mentoring, mental health and stress management, and the effect of legislation on women's professional lives. By providing a safe space for discussion, sharing experiences, and addressing these topics, the lunch series aims to break down barriers and build networks, foster a supportive environment, and empower women to thrive in biomedical engineering.

KEY WORDS   biomedical engineering; diversity and inclusion; women; underrepresented minorities

I. INTRODUCTION

The representation of women in science, technology, engineering, and mathematics (STEM) fields, including biophysics and biomedical engineering (BME), remains relatively low ($<$25%) in the United States and Europe (1, 2). Studies highlight the need for initiatives to attract and retain more women in the field, aiming to address the gender imbalance and harness the diverse perspectives and talents of all genders (1, 2). In recent years, BME has seen growing female enrollment at undergraduate and postgraduate levels. In 2021, women received a

higher percentage of first degrees in BME (51.5%) compared with men, as reported by the American Society of Engineering Education (3); however, women held only 26.7% of Tenured/Tenure Track faculty positions (3). The persistent underrepresentation of women in leadership positions within the field and in academia calls for continued efforts to promote gender diversity, equal opportunities for career advancement, and crucially to foster an inclusive environment that enhances a sense of belonging for women. Creating spaces where women feel valued, respected, supported, and included cultivates a culture that encourages and empowers diverse voices and talents to flourish in leadership roles.

In the academic setting, women in BME often face unique challenges in comparison to their male counterparts, who often dominate the field. The prevalence of gender bias, stereotypes, and implicit biases can significantly affect women's experiences and opportunities for career advancement and recognition (4). These biases can manifest in various ways, such as underestimating women's ideas and abilities, questioning their expertise, or assigning them less prestigious roles. Despite outperforming their male counterparts, women may be undervalued and their contributions overlooked because of preconceptions based on gender (5, 6). Another challenge faced by women in BME is the family-unfriendly expectations in the field, complicating the balance between career aspirations and family responsibilities. Further, the underrepresentation of women in leadership positions and decision-making bodies within academia exacerbates the challenges they face and limits the number of mentors who have prevailed in the face of adversity.

It is imperative to recognize the intersecting factors that contribute to gender disparities in academic STEM inequities. Beyond gender alone, considerations such as academic social capital, socioeconomic status, immigration status, native language proficiency, and ethnicity play pivotal roles in shaping individuals' experiences and opportunities within the field (7–9). For instance, individuals from marginalized socioeconomic backgrounds or immigrant backgrounds may face unique barriers related to access to educational resources, financial support, and professional networks. Similarly, those with non-native language proficiency or detectable accents may encounter biases in communication or opportunities for advancement. Additionally, ethnic minority women may contend with systemic racism and cultural biases that further compound the challenges they face in navigating academic environments (10–13). These intersecting identities can influence access to resources, professional networks, and career advancement pathways, thereby exacerbating disparities for women in academic settings.

Addressing these challenges requires comprehensive and concerted efforts from both institutions and the broader STEM community. Initiatives such as mentorship programs, support networks, and policies promoting work-life balance can help create an inclusive and supportive environment (14). Recognizing and challenging gender biases and stereotypes are crucial to ensure equitable opportunities for women in the field and must occur systemically. At the departmental level, we have launched a series of lunches designed to enhance the sense of belonging and augment support for our women's community. This initiative aims to create a safe space to identify challenges and sprout new strategies to foster a collaborative and inclusive environment for addressing the unique obstacles faced by women in BME, as well as provide an opportunity for identification and discourse about these challenges with members who do not identify as women but are crucial in expanding support for women and other underrepresented minority groups. Given the significant involvement of faculty, postdocs, staff scientists, and students in biophysics-related research within the University of California (UC) Davis BME Department and Graduate Group, we anticipate broader implications of this initiative on the biophysics community.

Local and national context

In the Spring of 2021, the BME Health, Equity, and Wellness (HEW) Committee, in concert with
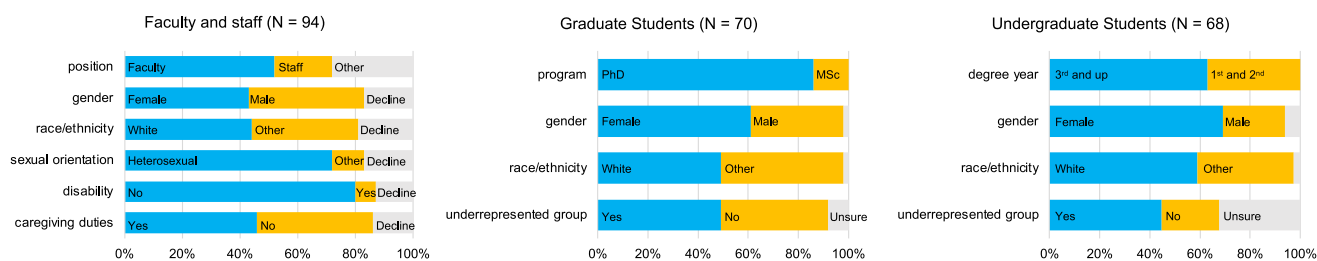
Fig 1. Demographics of the BME community climate surveys independently given to faculty and staff and graduate and undergraduate students in 2021.

the Office of Diversity, Equity and Inclusion (DEI) at UC Davis, surveyed the department and graduate group personnel to assess the climate of the community. We aimed to conduct a comprehensive evaluation of our community's status in terms of DEI, identifying our strengths and areas for improvement, allowing us to sustain the positive aspects and address any shortcomings effectively. The BME HEW contacted 160 faculty and staff members and received 94 responses. Tailored surveys were also directed to BME graduate students, with 70 responses (~70% of the graduate student body) and undergraduate students with 68 responses (~14% of the undergraduate population). Demographic information about the respondents is provided in Figure 1.

The results of the survey provided valuable insights into the disparities between male- and female-identifying respondents, highlighting distinct perceptions of belonging and inclusiveness. The survey findings indicated that women and individuals from historically marginalized groups (hereafter referred to as women[+]) experienced a different sense of belonging compared with their white male counterparts. The results reveal that female faculty, researchers, and staff in the BME department and graduate group frequently encounter challenges related to implicit bias, microaggressions, and a lack of adequate support, mentorship, and opportunities for professional advancement. Our survey findings align with those of campus- and nation-wide surveys. For example, the 2021 UC Davis Collaborative on Academic Careers in Higher Education (COACHE) Survey of Faculty Job Satisfaction revealed that female faculty, faculty of color, and faculty members from underrepresented

racial/ethnic groups (URMs) rate the standards and processes related to promotion to full professor less positively than male and white faculty. Female faculty members report lower levels of satisfaction with the service aspect of faculty work. Also, URM faculty members rate departmental collegiality lower than white faculty members (15). Using a census of 245,270 tenure-track and tenured professors at United States-based PhD-granting departments, a recent report showed that women leave academia at higher rates than men at every career stage. The reasons they leave are gendered, even for institutions, fields, and career stages in which retention rates are not. Women are more likely than men to feel pushed from their jobs and less likely to feel pulled toward better opportunities, and women leave or consider leaving because of workplace climate more often than work-life balance (16). Gender and ethnic/racial imbalances in the student experience are also well documented. For example, in the 2021 UC Graduate Student Experience survey, URMs, women, and transgender, nonbinary, and genderqueer students reported poorer experiences with mentorship and advising (17). The report notes that this finding is particularly concerning given past literature that highlighted how especially essential positive advising experiences are for predicting positive career outcomes among underrepresented groups such as women in STEM disciplines (18). Together, these results emphasize the need for targeted interventions and initiatives to address these issues and create a more inclusive and supportive environment for all members of the department and graduate group.

II. RESULTS

A. Implementing the Women$^+$ in BME Lunch Series

The HEW Committee has taken proactive steps to address these concerns by organizing the Women$^+$ in BME Lunch Series. This initiative is specifically designed to foster a supportive and empowering environment where women, individuals from underrepresented groups, and their allies can come together, connect, and share experiences. The term "allies" refers to individuals who support and advocate for marginalized groups, and in this context, self-identified allies include established faculty, staff, and student leaders of all genders. We valued the inclusion of male allies (and especially those in leadership positions) as crucial for fostering a more inclusive and supportive environment within the BME community. Their active participation and advocacy not only demonstrate solidarity with marginalized groups but also highlight the necessity of collective action in advancing gender equity and diversity initiatives. By creating a platform for open dialogue, mentorship, and support, the initiative aims to identify and address barriers faced by these individuals, promote horizontal and vertical networking opportunities within our community, and ultimately bridge the gender gap within the BME field.

The lunch series was launched in Spring 2023 on a bimonthly premise. The initial success and traction of the lunch series called for increased meetings, and as of Fall 2023, lunches were held monthly. From the start, the series emphasized inclusivity and encouraged participation from all individuals across all backgrounds in our community. A sign-up list facilitated attendance, and catered food was provided by the department to enrich the experience and facilitate a more casual, safe environment for dialogue. Discussion topics were generated and voted on during the first meeting in alignment with the participants' interests. Lunchtime discussions were moderated by various individuals within the HEW committee. Expert guest speakers were selectively invited, further enriching the

overall experience of the lunch series by fostering diverse perspectives and meaningful, informed conversations. We note that it is crucial to demonstrate flexibility and responsiveness to current societal challenges, ensuring that these sessions are tailored to address the immediate needs and concerns faced by the audience. Topics were chosen and moderated at each session, and we also catered to the natural flow of relevant discussion topics to ensure that diverse perspectives were heard and to inform topics for future lunch series.

Relevant topics were covered for the personal and professional growth of women$^+$ in our BME community (Fig 2).

1. Allyship

The lunch series created an open and inclusive atmosphere, bringing together diverse participants—including undergraduate and graduate students, postdocs, faculty, and academic and administrative staff members—fostering intergenerational discussions and a broad range of perspectives. The lunch series aimed to create a supportive space for women and individuals from historically marginalized groups in BME, but it is crucial to highlight that these events were not intended to exclude any group and to acknowledge the importance of allies and their contributions to promoting gender equity and diversity in the field. To emphasize inclusiveness and enhance ally engagement, one session actively invited allies from the departmental leadership, work, and student body. This session signaled robust support for our initiative and allowed us to address prevailing challenges directly. Actively seeking feedback from all participants ensures responsiveness to the diverse needs of the community, encourages collaboration, and informs on and addresses disparities for a more supportive climate.

2. Mentoring

Mentors play a pivotal role in nurturing talent, providing insights into navigating challenges, opening doors, enhancing networking opportunities, and empowering mentees to reach their full potential (14). Devoting a session to effective

	Mentoring	Mental Health and Stress Management	Work Travel post the Abortion Ban	Allyship	Work + Life
At lunch	- Facilitate connections - Establish support network	- Open discussion - Promote self-care and well-being	- Supportive discussion - Space to voice concerns - Awareness to resources	- Exchange perspectives - Show evidence of broader support for women+ - Brainstorm ideas for collaboration	- Debate of work + life perceptions - Share strategies
Pathways	- Active listening - Understand goals - Provide tailored guidance - Diversify network	- Support network - Coping mechanisms - Establish boundaries - Build resilience	- Non-judgmental support	- Engage allies - Increase camaraderie - Raise awareness	- A healthy workforce - Mindfulness around self/family time - Supportive work environment
Implementation	- Mentorship training for faculty and staff - Mentorship circles - Search platforms	- Teach stress reduction techniques - Accessible library of resources - Strengthen support circles	- Compile a library of available resources - Mentorship circles	- Involve allies in the conversation by personal invitation - Discuss strategies to improve the status quo together - Offer training	- Improve childcare options (grants, sponsorship, etc.) - Cultivate self-care culture

Fig 2. Summary of the experiences provided at the sessions, and pathways and specific implementations suggested during the lunch discussions.

mentoring, we learned that this involves active listening, understanding individual goals, and providing tailored guidance. We also recognized the need for diverse mentorship networks beyond those currently offered within the university and the department that can offer various perspectives and experiences (14). Future steps include mentorship training, fostering diverse mentorship circles, and creating platforms for women+ to connect with mentors who understand their unique challenges. By translating these insights into concrete strategies, we can enhance mentorship experiences and contribute to the growth and success of women in our field.

3. Mental health and stress management

Recognizing the adverse effect on mental well-being caused by the demanding nature of academia, particularly when navigating the challenge of balancing professional and personal responsibilities during nontraditional working hours (19), we provided a safe space for sharing experiences and discussing self-care strategies, with discussions guided by invited speakers. Open dialogues were centered around self-care, resilience, coping strategies, and stress-reduction techniques. We learned that setting boundaries; seeking support from peers, mentors, and mental health professionals; and engaging in activities that feed our emotional and physical

reserves are essential components to augment resilience. Organizing regular workshops on stress-reduction techniques, reminding the community of resources to access mental health services, and establishing peer support networks could help cultivate a culture that prioritizes the well-being of its members.

4. Work-related travel in post-*Roe* era of abortion bans

Addressing the far-reaching implications of recent U.S. legislation on reproductive rights (20), we focused on creating a supportive environment for discussing ethical and personal considerations related to work-related travel and career relocations (12). By communicating experiences and insights, voicing concerns, and sharing resources, we tried to navigate this complex issue as a group, fostering understanding and support among our members. The intersection of reproductive rights and professional responsibilities is a complex and deeply personal matter. We realized the need to approach this issue with empathy, acknowledging the diversity of experiences and viewpoints within our community. Future endeavors to address this challenge could focus on creating a resource hub that provides information about reproductive rights laws and policies across different states (21). Additionally, establishing mentorship circles, as suggested previously,

specifically dedicated to discussing this issue, may be a first step for women to seek guidance from those who have navigated similar situations in making informed decisions about their professional journeys.

5. Work + life

The group exchanged perceptions about the dynamics between work and life. We learned that the balance or integration of the two often opposing elements changes according to the individuals' needs in each season of life. The value of having a diverse group in both age and role was expressly manifested in this empathic session because younger students sought feedback from more senior members. In conclusion, protected time beyond work hours was widely appreciated and sought after. This protection will come from a more accommodating culture that can be influenced by institutional practices, including avoiding meetings after hours, providing financial support for childcare options, and promoting self-care activities, among others.

III. DISCUSSION AND CONCLUSIONS

Through the organization and implementation of the Women[+] in BME Lunch Series, the BME-HEW at UC Davis demonstrates their commitment to creating a more inclusive and supportive community. Via these discussions and shared experiences, the initiative breaks down barriers, builds networks, and empowers women[+] to be leaders in their field and continue to promote these efforts in their future endeavors.

A. Breaking barriers and building networks

The lunch series emphasizes the significance of building networks to foster collaborations and advance careers for women[+] in BME. By facilitating connections within the field, the initiative aims to break down barriers and promote a sense of camaraderie in a common, safe space. Women[+] can share their experiences, seek advice, and foster collaborations that transcend organizational boundaries. These connections not only empower individuals but also contribute to creating a more inclusive and diverse BME community.

One of the most significant benefits of the lunch series was the exposure to stories of success, failure, and resilience. Learning about the challenges and setbacks faced by successful women[+] in the field can help normalize the experience of failure and demonstrate that it is a natural part of the learning and research process. By sharing experiences, role models can provide valuable insights into how they navigated obstacles, overcame setbacks, and developed resilience. This knowledge can be empowering for students and early career academics, helping them develop a growth mindset and the ability to persevere in the face of adversity.

Further, the significance of these networks extends beyond personal support, playing a crucial role in career development and collaborative research endeavors. The connections formed during these lunches create a platform that enhances professional visibility and is a valuable resource for career guidance, mentorship, navigating intricacies of grant writing and securing funding, especially for early career researchers. As such, the lunch series acted as a catalyst for personal growth and building resilience. By including both academics and administrative staff, the lunches promoted a holistic understanding of the academic ecosystem and recognized that success is a collaborative effort of all professionals involved. Gaining insight into each other's roles and responsibilities can increase appreciation and fostering a culture of mutual respect and understanding.

B. Measuring outcomes

Our lunch series aims to create a supportive environment and address the challenges faced by women and underrepresented individuals in the BME department and graduate groups. This sets our initiative apart from other campus-wide initiatives (such as those supported by NSF ADVANCE [22]) because it allows the program to address unique challenges and opportunities that are specific to this discipline. The tailored approach addresses the specific

PRE-EVENT SURVEY

POST-EVENT SURVEY

Fig 3. Pre- and post-event survey questions for participants of the Women[+] in BME Lunch Series.

needs and concerns of women[+] within the BME department/graduate group to increase the sense of belonging and build a more cohesive BME community. This is a crucial step before we can tackle larger campus-wide goals. It is anticipated that the intervention will contribute to increased belonging and a sense of inclusiveness; it is essential to measure its effect. To assess the effectiveness of the lunch series, we use several key metrics and evaluation methods. Beginning in Fall 2023, we ask participants to complete surveys before and after attending each lunch. These surveys include questions related to the participants' sense of belonging, perceived support and expectations, and overall satisfaction with the department/program (Fig 3). The comparison of responses before and after the interventions provides insights into any changes in perceptions. We are exploring the opportunity to team with the Center for Educational Effectiveness at UC Davis to assess program outcomes. For example, conducting focus groups and individual interviews with participants allows for in-depth qualitative feedback, whereby participants can highlight any positive changes or challenges encountered, and offer suggestions for improvement. We track attendance and participation rates throughout the lunch series to help gauge the level of interest and engagement among the target audience

(Fig 4, with attendance for the women[+] series in Spring and Fall 2023). Consistent and growing attendance may indicate a positive effect on participants' perceived value and sense of belonging. We have seen a strong response from our community, with especially high engagement in the first couple of sessions. Fluctuations in attendance have occurred, potentially linked to challenging unexpected events on campus and conflicting schedules (23). For Fall 2023, we adopted a monthly meeting schedule and polled our community to find a time/day that works for the majority of those interested with the goal of maximizing participation. This has resulted in high attendance rates for the Fall 2023 sessions (Fig 4). We welcomed a diverse group of participants of all gender identities from various stages of their careers, including faculty, tenured and tenure-track; graduate and undergraduate students; postdocs; and scientific and administrative staff (Fig 4). Although the lunches initially included mostly women, as each session went on, the success of the supportive and thought-provoking luncheon environment was passed across demographics, engaging not only women faculty, staff, and students, but male and gender-nonconforming allies.

The primary expected outcome is a measurable increase in participants' **sense of belonging** within the BME community. This may be reflected
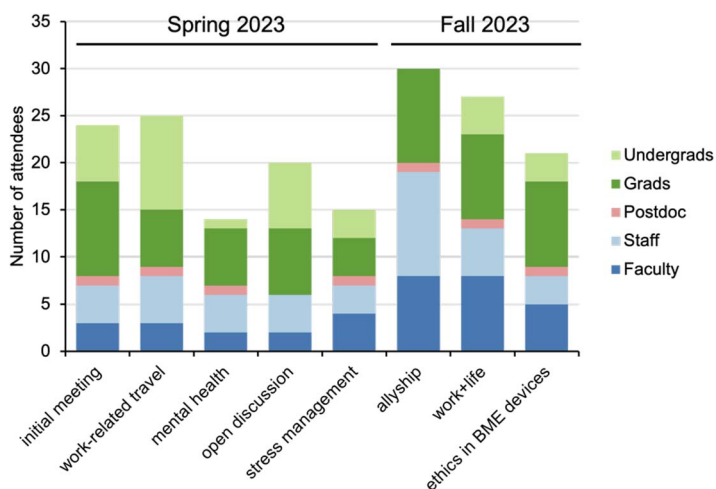
Fig 4. Attendance chart to the Women[+] in BME lunches during the five sessions in Spring 2023 held biweekly and the three monthly sessions in Fall 2023. Each session was dedicated to a topic of interest drawn from a brainstorming session during the first lunch.

in survey responses that indicate a stronger connection to the department/graduate group and a more inclusive environment. The lunch series aims to foster mentorship, support, and networking opportunities. An expected outcome is the **creation of a stronger support system**, as reflected in participants' feedback on the value of connections made and support received. By addressing issues such as work-related travel, career relocations, and familial obligations, it is anticipated that the lunch series will positively affect participants' **professional well-being**. This may be evident in interview responses related to work-life balance, stress management, and career satisfaction.

Our program assessment timeline is as follows. In Winter 2024, we will start conducting focus groups and interviews following the women[+] events held in Spring and Fall 2023 to capture immediate feedback and identify early trends. Analyzing post-event surveys from several sessions will help identify any emerging patterns or shifts in participants' perceptions. At the one-year mark (Spring 2024), we will conduct a comprehensive evaluation of the lunch series' effect by comparing pre- and post-event survey data over the year-long period. We expect to gain deeper insights into participants' experiences and outcomes through qualitative feedback from focus groups and interviews. Based on the evaluation results, we will make necessary adjustments and improvements to the lunch series to further enhance its effectiveness.

We expect to be able to measure the effect of the intervention on increased belonging and its broader outcomes via a combination of quantitative and qualitative assessment methods over the suggested annual timeline. We will use the information to refine and tailor the program to better meet the needs of women and individuals from underrepresented groups in BME.

C. Fostering mentorship and community

The Women[+] in BME Lunch Series serves as an invaluable platform not only for fostering dialogue and support but also for cultivating effective mentoring relationships within the biomedical engineering community. By bringing together individuals from diverse backgrounds and career stages, these gatherings create fertile ground for mentorship to thrive. These mentoring relationships extend beyond the confines of the lunch series and lay the foundation for enduring connections. In recognition of its transformative power, we integrate mentorship into the fabric of the Women[+] in BME initiative and underscore its pivotal role in shaping the future of our discipline and advancing DEI opportunities within our academic community.

D. Sustainability of the Women[+] in BME Lunch Series

To ensure its continuity, a robust framework and resource allocation plan for the lunch series are essential. The events are currently organized by a standing committee within the department comprising faculty, staff, researchers, and students,

and the department sponsors these initiatives. The budget for these events is discussed at the beginning of each academic year, ensuring appropriate financial resource allocation. We are grateful that the department recognizes the utility of these lunches and continues to support them.

Aside from funding, the sustainability of this lunch series requires a long-term plan that considers recognition for the service of those involved and documentation and sharing of best practices to inspire broader and long-term adoption of such initiatives within academic institutions. Initiating and sustaining the Women[+] series necessitates substantial leadership and service from majorly women-identifying faculty, staff, researchers, and students. The methods for recognizing their contributions can vary and should be designed to encompass the diverse roles and backgrounds of those involved, whether they are faculty, staff, researchers, postdocs, graduate students, or undergraduates. Faculty and professional researchers' involvement in the HEW committee is recognized similarly to service on other departmental standing committees. This recognition is critical for career advancement, and it can be incorporated into the merit and promotion processes. DEI statements, as part of these processes, can explicitly highlight the faculty contributions to the HEW committee. Staff members play a vital role in supporting and organizing diversity and inclusion initiatives. Recognizing their service can include annual service awards specifically tailored to acknowledge their contributions to committees similar to HEW. Students and postdocs are integral to the success of initiatives similar to the HEW committee. Their service should be honored through certificates of recognition, appreciation events, academic credits, or mentions in department communications. Similar to staff members, the contributions of students, researchers, and postdocs can be considered in their career advancement evaluations and curriculum vitae. Based on our findings, we are actively advocating for changes in department policies and guidelines, particularly in tenure, promotion, and merit increase criteria. In response, the BME Department Chair charged a committee with evaluating the assessment of DEI activities in BME merit and promotion actions. The group is working to create a series of recommendations to the faculty for discussion/vote and subsequent inclusion in the department handbook.

To inspire broader adoption of similar initiatives across academic institutions, we commit to documenting and sharing best practices and outcomes. This is a crucial component of sustainability and translation of this lunch series. Reports will be generated, and dissemination will occur through various channels including our newsletters, the college and campus newsroom, and publication in scientific journals. Transparently sharing our experiences, challenges, failures, and successes contributes to the collective knowledge in fostering inclusivity and diversity within academic settings, with the possibility that the skills and empathy learned in the series get translated into future positions by attendees as well.

E. Empowering women[+] to lead: Shaping the future

Our initiative equips the women[+] community with the necessary tools, resources, and support networks to excel and lead by addressing and validating the unique challenges they face. The Women[+] in BME Lunch Series thus far has revealed some issues that should be given immediate priority as points of future discussion topics. One key area of focus is bias and imposter fears, recognizing the need for increased awareness and interventions to counteract these biases and foster a more inclusive climate within the department. Discussions and training in DEI will play a crucial role in raising awareness and promoting a culture of understanding and acceptance. Another crucial topic for discussion within the lunch series is child and elderly care. Women often face challenges when balancing career aspirations with familial responsibilities. The lunch series provides an opportunity to explore policies and practices that can help create a supportive work environment. This includes discussing flexible work arrangements, family-friendly policies, and other initiatives that can accommodate the needs

of individuals who are caring for children or elderly family members.

The lunch series nurtures a culture of leadership in which women+ drive positive change and shape the future of BME. It is also essential to emphasize that the lunch series is part of a broader effort to promote DEI within the department. It serves as one of the many HEW initiatives—including opportunities for DEI education and training and the justice, equity, diversity, and inclusion (JEDI) seminar speaker series—to create an environment where everyone feels valued, respected, and supported, regardless of their gender, race, ethnicity, abilities, or background. Through ongoing collaboration and engagement, we will foster an inclusive culture that recognizes and celebrates the diverse perspectives, experiences, and talents of all members of the BME community.

Although the conclusions drawn from the Women+ in BME Lunch Series may not be entirely surprising, several unique aspects of this study contribute to its relevance and significance. First, the findings and conclusions are rooted in the specific experiences and perspectives of individuals within the BME community, offering a nuanced understanding of the challenges and opportunities faced by women and underrepresented individuals within this academic context. Second, the lunch series represents a community-led initiative driven by the needs and priorities of its participants, emerging organically from within the BME department to ensure direct relevance and actionability for its members. Third, the lunch series goes beyond documenting gender disparities in STEM fields to actively explore and implement solutions. Finally, the insights gained from our initiative hold relevance beyond our department's borders. By addressing gender disparities and promoting inclusivity in BME, our program also contributes to fostering a more diverse and representative biophysics community. We aim to inspire similar initiatives in other departments and institutions, thereby catalyzing systemic changes that advance gender equity and inclusion across the biophysics landscape.

AUTHOR CONTRIBUTIONS

EG and AA-G wrote the manuscript. All other authors were involved in the discussion and provided valuable edits, comments, and feedback.

DECLARATION OF INTERESTS

The authors declare no competing interests.

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REFERENCES

1. Barabino, G., M. Frize, F. Ibrahim, E. Kaldoudi, L. Lhotska, L. Marcu, M. Stoeva, V. Tsapaki, and E. Bezak. 2020. Solutions to gender balance in STEM fields through support, training, education and mentoring: report of the International Women in Medical Physics and Biomedical Engineering Task Group. *Sci. Eng. Ethics*. 26:275–292.

2. Noonan, R. Office of the Chief Economist, Economics and Statistics Administration, U.S. Department of Commerce. (November 13, 2017). Women in STEM: 2017 Update (ESA Issue Brief #06-17). Retrieved from https://www.esa.gov/reports/women-stem-2017-update.

3. American Society for Engineering Education. 2022. Profiles of Engineering and Engineering Technology, 2021. Washington, DC.

4. National Academy of Sciences (US), National Academy of Engineering (US), and Institute of Medicine (US) Committee on Maximizing the Potential of Women in Academic Science and Engineering. Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering. Washington (DC): National Academies Press (US); 2007. PMID: 20669424.

5. Bloodhart, B., M. M. Balgopal, A. M. A. Casper, L. B. S. McMeeking, and E. V. Fischer. 2020. Outperforming yet undervalued: Undergraduate women in STEM. *PLoS One*. 15:e0234685.

6. Boivin, N., S. Täuber, U. Beisiegel, U. Keller, and J. G. Hering. 2023. Sexism in academia is bad for science and a waste of public funding. *Nat. Rev. Mater.* 1–3.

7. Morgan, A. C., N. LaBerge, D. B. Larremore, M. Galesic, J. E. Brand, and A. Clauset. 2022. Socioeconomic roots of academic faculty. *Nat. Hum. Behav.* 6:1625–1633.

8. Misra, J., A. Kuvaeva, K. O'Meara, D. K. Culpepper, and A. Jaeger. 2021. Gendered and racialized perceptions of faculty workloads. *Gend. Soc.* 35:358–394.

9. Thomson, R. A., E. S. Salazar, and E. H. Ecklund. 2021. The very ivory tower: pathways reproducing racial-ethnic stratification in US academic science. *Ethn. Racial Stud.* 44:1250–1270.

10. Hoppe, T. A., A. Litovitz, K. A. Willis, R. A. Meseroll, M. J. Perkins, B. I. Hutchins, A. F. Davis, M. S. Lauer, H. A. Valantine, J. M. Anderson, and G. M. Santangelo. 2019. Topic choice contributes to the lower rate of NIH awards to African-American/black scientists. *Sci. Adv.* 5:eaaw7238.

11. Birney, M. E., A. Rabinovich, T. A. Morton, H. Heath, and S. Ashcroft. 2020. When speaking English is not enough: the consequences of language-based stigma for nonnative speakers. *J. Lang. Soc. Psychol.* 39:67–86.

12. Lewis, N.A., Jr. What I've learned about being a Black scientist. *Science* (16 June 2020); 10.1126/science.caredit.abd3589.

13. Butner, B. K., H. Burley, and A. F. Marbley. 2000. Coping with the unexpected. *J. Black Stud.* 30:453–462.

14. Deanna, R., B. G. Merkle, K. P. Chun, D. Navarro-Rosenblatt, I. Baxter, N. Oleas, A. Bortolus, P. Geesink, L. Diele-Viegas, V. Aschero, M. J. de Leone, S. Oliferuk, R. Zuo, A. Cosacov, M. Grossi, S. Knapp, A. Lopez-Mendez, E. Welchen, P. Ribone, and G. Auge. 2022. Community voices: the importance of diverse networks in academic mentoring. *Nat Commun.* 13:1681.

15. OECD. 2018. Overview of survey results. *Corp. Gov.* 39–52.

16. Spoon, K., N. LaBerge, K. H. Wapman, S. Zhang, A. C. Morgan, M. Galesic, B. K. Fosdick, D. B. Larremore, and A. Clauset. 2023. Gender and retention patterns among U.S. faculty. *Sci. Adv.* 9:eadi2205.

17. University of California Institutional Research and Academic Planning. Graduate and professional student advising at the University of California. 2021. https://www.ucop.edu/institutional-research-academic-planning/_files/survey-documents-graduate/2021-ucgses-advising.pdf.

18. Primé, D. R., B. L. Bernstein, K. G. Wilkins, and J. M. Bekki. 2015. Measuring the advising alliance for female graduate students in science and engineering. *J. Career Assess.* 23:64–78.

19. Nicholls, H., M. Nicholls, S. Tekin, D. Lamb, and J. Billings. 2022. The impact of working in academia on researchers' mental health and well-being: a systematic review and qualitative meta-synthesis. *PLoS One.* 17:e0268890.

20. 2022. Dobbs v. Jackson Women's Health Org., 142 S. Ct. 2228 (Dobbs v. JWHO).

21. Center for Reproductive Rights. 2024. After Roe fell: abortion laws by state. Accessed 15 August 2023. https://reproductiverights.org/maps/abortion-laws-by-state/.

22. ADVANCE: organizational change for gender equity in STEM academic professions (ADVANCE). Accessed 21 November 2023. https://new.nsf.gov/funding/opportunities/advance-organizational-change-gender-equity-stem.

23. UC Davis News and Media Relations. UC Davis Statement on Fatal Crimes in Davis. April 30, 2023. https://www.ucdavis.edu/news/uc-davis-statement-fatal-attacks-davis.