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# Coalition-building for labor actions in life sciences departments: lessons from the largest academic strike in history

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## Abstract

In life sciences graduate programs in the United States, efforts are underway to address barriers to academic success—namely, using interventions targeted at addressing inclusivity and diversity concerns. However, graduate students are typically simultaneously workers for their institutions, where they face workplace challenges such as low wages, inadequate benefits, and vulnerability to harassment and abuse. These challenges may disproportionately affect workers with excluded identities and are thereby barriers to diversity and equity. In recent years, graduate student unionization has expanded. The outcomes of these movements may improve pay, benefits, and working conditions for graduate workers; however, labor organizing presents numerous challenges in academic environments. We reflect on our experiences in a life sciences department at the University of California, Santa Cruz, in 2022 during the largest graduate labor strike to date. We summarize the challenges and discuss successful interventions, including communication strategies for cross-stage coalition building at the departmental level.

**Keywords:** graduate student, labor action, strike, union, equity

Unions are increasingly common at universities for faculty, administrative, and service staff (Hazboun 2022). Historically, union structures have been powerful tools to negotiate for institutional change of working conditions, allowing workers to negotiate for better wages, benefits, working environments, and ultimately labor contracts, which delineate rights and provide stability and protections (Murolo 2003, Dubofsky and McCartin 2017). The first US graduate workers' unions were formed in the 1960s and have advocated for worker protections at many public and private institutions across the country (Clynes 2022). In the United States, graduate worker unionization within academic institutions has been growing, with rapid increases in recent years (Herbert et al. 2023, 2024), mirroring strong graduate student labor organizing in other countries (Schiavo 2021, Adebisi 2022). Although the complex nature of graduate student employment has made studies on the economic outcomes of graduate student unionization difficult, larger-scale studies on unionized workers demonstrate that unionized workers on average have improved benefits and 13.2% higher wages than workers in similar nonunionized roles, with larger gaps between unionized and nonunionized workers of color (Bivens et al. 2017, Kroeger et al. 2018). Recent graduate union contract negotiations have achieved increased salaries

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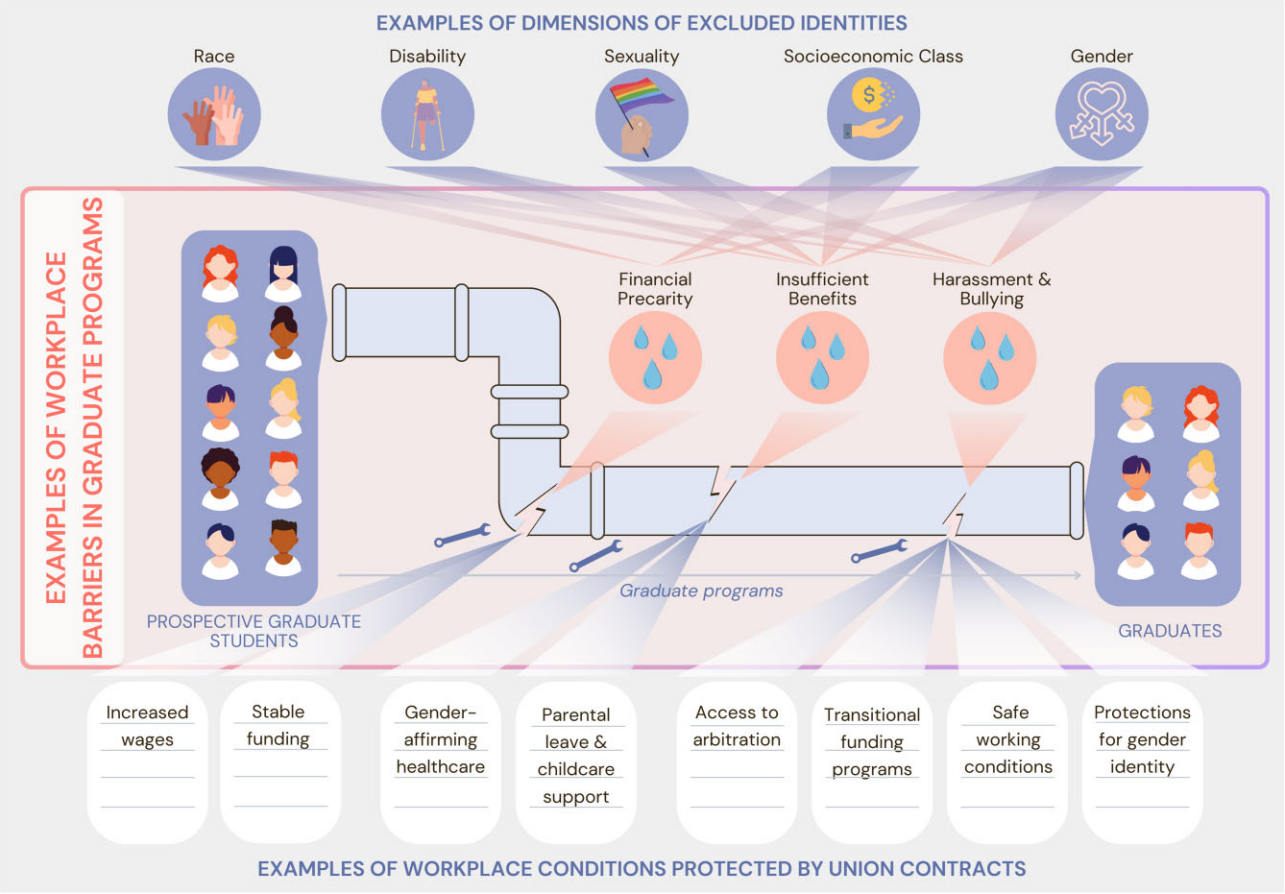


**Figure 1.** Examples of barriers to retention in graduate programs and subsequent career success that graduate students face as academic employees, examples of how these barriers are exacerbated for students with intersecting excluded identities, and examples of changes to working conditions won by union contract negotiations that may act as interventions to address these barriers. The links shown in the present figure are examples of ways that students with intersecting excluded identities may experience amplified barriers and tools to address barriers and should not be considered comprehensive. See the supplemental material for more detail and references for the barriers and links shown with included references.

(Levin 2021), improved healthcare coverage (Sabo 2023), and gained protections against harassment and bullying for graduate students (Wong 2022).

Although unions are not free of discrimination (Frank 2014, Gardner 2022), organized labor has historically been a powerful tool to reduce racial and gender-based pay gaps and to provide recourse to deal with unfair dismissals that disproportionately affect workers of color (Madland and Rowell 2018, Bivens et al. 2023). Within academic institutions, the union structure allows workers to collectively identify and combat systemic barriers for students with excluded identities, such as by negotiating for inclusive workplaces that recognize employees with access needs or reducing financial barriers for international student workers (figure 1; see the positionality statement for our use of *excluded identities*). For example, in 2005, the Graduate Employees' Organization at the University of Michigan was one of the first unions to successfully negotiate for transgender rights, expanding institutional health care coverage to include gender-affirming care (Stripling 2009). Although there are existing institutional initiatives in the United States to advance diversity, equity, and inclusion (DEI) in the life sciences by improving representation, departmental culture, and more (Chang et al. 2016, Beltran et al. 2020, Cronin et al. 2021, Kamran and Jennings 2023), the working conditions of the graduate career stage remain a barrier to completion of graduate programs for many students, especially those with excluded identities (Laufer and Gorup 2019). When institutions fail to adequately address these workplace barriers, labor organizing and unionization can be powerful tools to improve working conditions (Banerjee et al. 2021).

The academic union context is challenging, given the intertwined nature of education and employment within institutions, complicating both negotiations and labor actions. Graduate students occupy a unique space where they both perform work for and receive training from their academic institutions. While they are in graduate school, life sciences graduate students increasingly serve as teaching assistants, course instructors, student researchers, or researchers on fellowships (Colby 2023, Herbert et al. 2023). These roles were often historically filled by higher-paid faculty, staff, and postdocs (Herbert 2021). In exchange for their labor, graduate students often receive a remission of tuition and fees and a stipend, although work contracts are not necessarily guaranteed from semester to semester. In most cases in the United States, graduate student worker positions are capped at 50% time because there is an assumption that the students will be working in an unpaid capacity for the other 50% on their education. Graduate advisors frequently fill the role of both academic mentors and employment supervisors, creating a tenuous dynamic for graduate students where equity in life science education is intrinsically linked to their employment conditions. In addition, the terms and conditions of graduate student employment are not always clear; may or may not include worker protections; and can vary across labs, departments, and divisions, resulting in further inequities.

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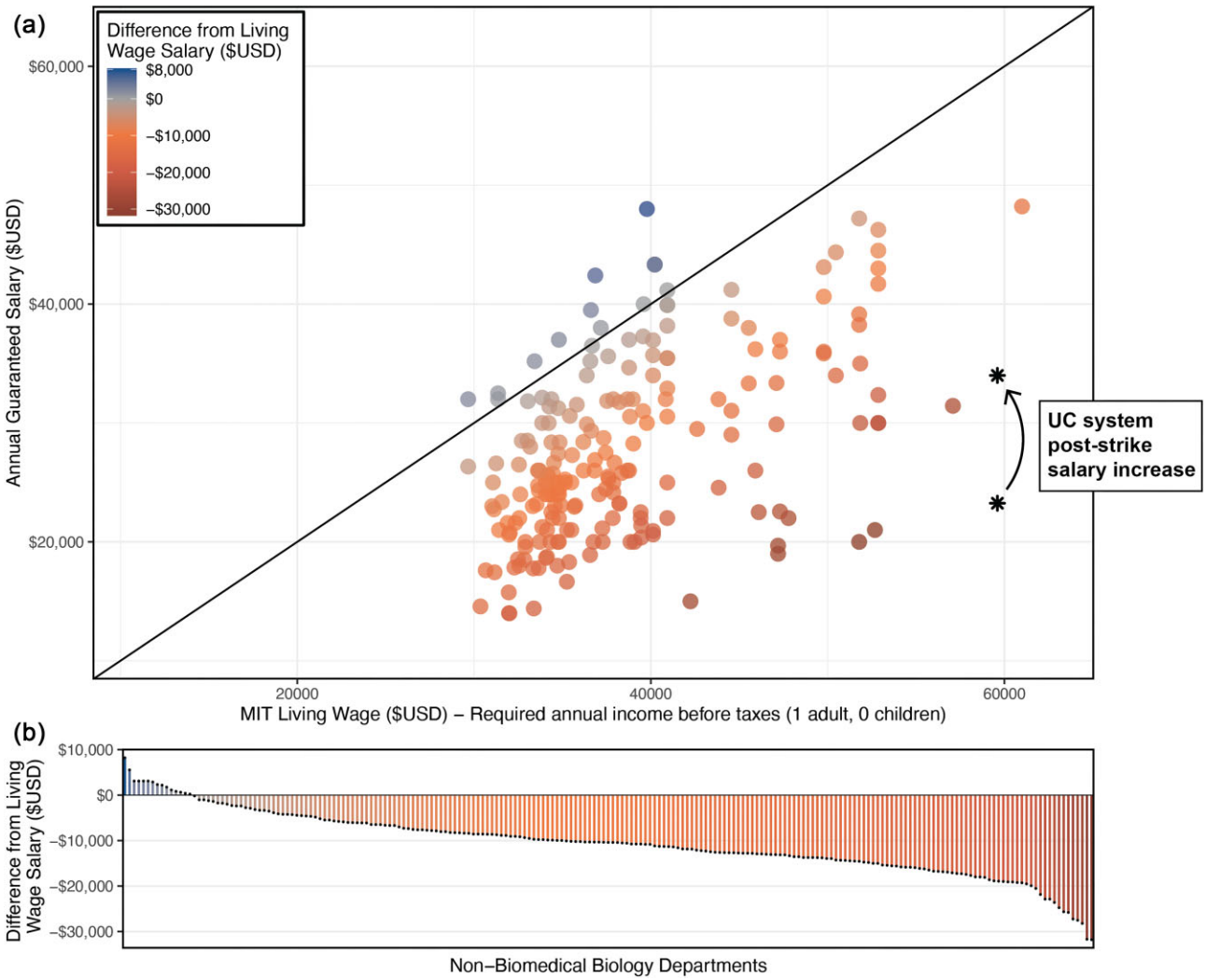


**Figure 2.** Using a crowdsourced, curated data set of PhD student stipends in nonbiomedical biology fields (Gaynor and Rautsaw), we (a) depict the discrepancies between annual minimum guaranteed PhD student salaries and the MIT required annual income before taxes (i.e., location-specific estimate of financial cost of basic needs) as calculated by the MIT Living Wage Calculator (Glasmeier 2024) for a household with one adult and no children. Each point represents a nonbiomedical biology department. To demonstrate the impact of the 2022 strike on UC graduate student salaries, the two points in black are included, indicating the UC-wide minimum guaranteed PhD student salaries prior to the 2022 strike and new minimum salary guaranteed by the contract won by the strike, effective as of 1 October 2024. Both are plotted against the average MIT living wage for counties containing the 10 UC campuses as of 4 November 2024. (b) The majority (94%) of departments in the Biology PhD Stipends database do not provide a living wage. 38% of the departments provide $0–$10,000 below a living wage, 48% provide $10,000–$20,000 below a living wage, and 6% provide $20,000 or more below a living wage. Each bar represents one nonbiomedical biology department. Source: The data presented in this figure were sampled from Gaynor and Rautsaw's data set on 2 June 2023.

The precarious nature of graduate employment creates an environment that often results in poor working conditions, including financial precarity (figure 2; Woolston 2022), insufficient benefits (Ajayi et al. 2022), and risk of workplace harassment (figure 1 and see the supplemental material for more details; Wilkins et al. 2023). Although being a graduate student is a temporary state in pursuit of a more permanent career, these conditions can create significant hurdles to degree completion and subsequent career success, especially for students with excluded identities, who may already face intersecting barriers (figure 1; Sowell et al. 2015, Ajayi et al. 2022, Wilkins et al. 2023). For example, the representation of students with dependents is essential to address gender diversity. However, student parents confront institutional obstacles, including time constraints, inflexible teaching and fieldwork schedules, financial strain, and campus environments that lack support for caregiving responsibilities (Smith et al. 2006, Reichlin Cruse et al. 2021, Ajayi et al. 2022). Similarly, the representation of international students in graduate programs is critical to improve cultural diversity in the life sciences. However, international students may face barriers that make their status as students and employees more precarious, including steep linguistic and cultural learning curves early in their graduate careers and increased financial precarity from moving expenses, ineligibility for host country fellowships, and visa restrictions for off campus employment (Reichlin Cruse et al. 2021, Amano et al. 2023, Laframboise et al. 2023). Ultimately, these obstacles can cause matriculation failures and financial hardship, potentially perpetuating intergenerational impacts (Ajayi et al. 2022). Given that financial stability and inclusive environments strongly influence successful completion of graduate programs (Sowell et al. 2015), addressing systemic workplace barriers directly benefits DEI efforts by addressing a key causal factor contributing to these inequalities (figure 1).

As labor organizing and unionization efforts become more common in graduate programs in response to precarious working conditions, life science departments may be caught between

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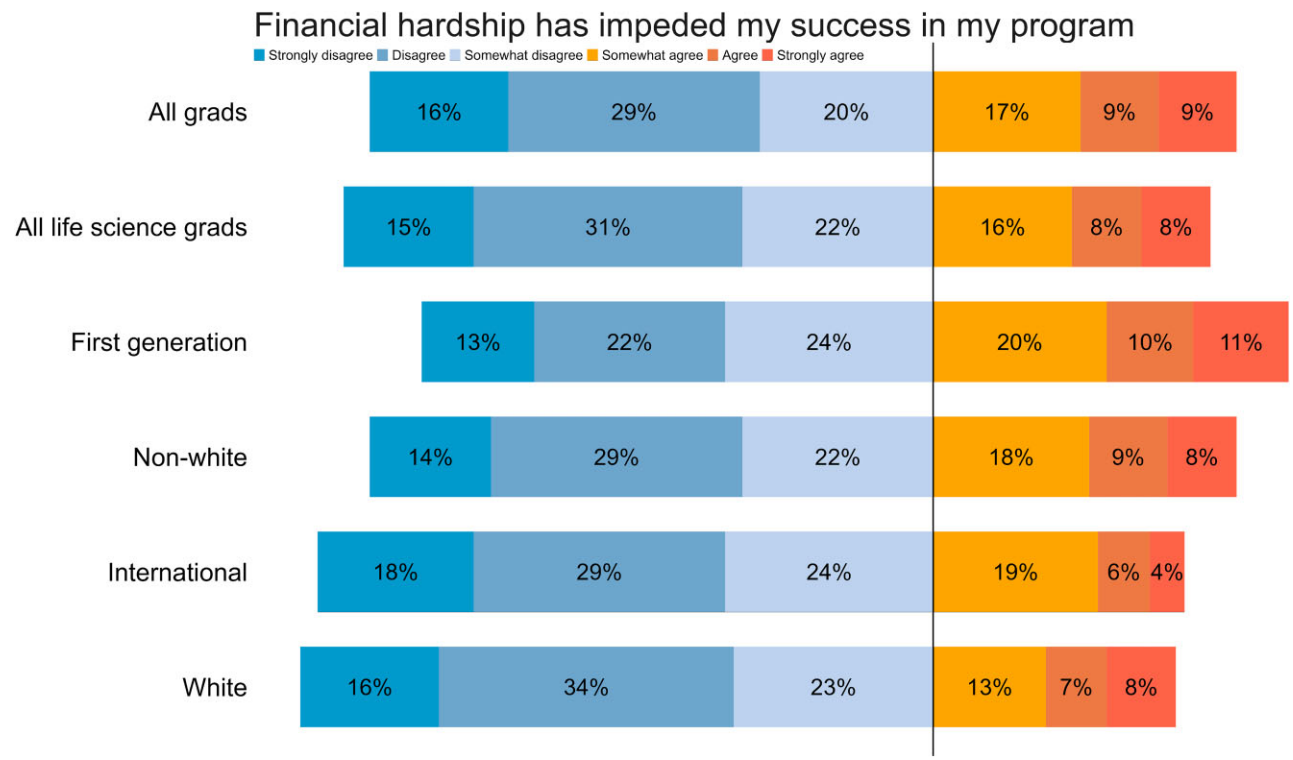


**Figure 3.** UC Graduate Student Experience Survey data on financial precarity for all graduate students, all life science graduate students, and the subsets of life sciences graduate students who self-identify as White, non-White, international, and first-generation (University of California Information Statistics Center 2022).

contradictory workplace and education demands, particularly during labor actions such as strikes. We are undergraduate and graduate students, postdoctoral researchers, staff, and faculty at the University of California (UC) system, where graduate workers (teaching assistants, graduate student instructors, graduate student researchers, and fellows) are unionized through the United Auto Workers (UAW) union. In 2022, extended contract negotiations for graduate worker contracts culminated in a labor strike across all UC campuses. Graduate labor strikes are challenging, given the intertwined nature of education and employment, and the 2022 UC strike presented novel challenges in life sciences departments, because it was the first graduate labor strike in the United States where graduate student researchers (e.g., those funded on fellowships or grants to perform research labor for their own research or that of other primary investigators) were unionized alongside graduate students employed for teaching labor (Barajas 2021).

Collective actions such as strikes are inherently disruptive, and their impacts on individuals, particularly undergraduates, cannot be eliminated. Recognizing these challenges and the complexity of public education funding, we discuss lessons learned during the 2022 strike around tools for organizing in life sciences departments and discuss approaches to improve coalition building and maintain department communities during strikes in a US context.

## Reflections on coalition building in life sciences departments from the 2022 University of California labor strike

Although some workplace barriers may be mitigated through short-term patches (e.g., departmental food pantries) and creative funding solutions by principal investigators (PIs) and staff, most cannot be addressed meaningfully without systemic institutional change. Unionization within academia can be an effective tool to address workplace barriers by providing a framework to negotiate for improved working conditions, such as childcare support, protection from bullying and harassment, and fair compensation and benefits (figure 1 and the supplemental material).

Financial uncertainty is a key barrier to graduate student success in the UC system (figure 3). In 2022, following an extended series of unproductive contract negotiations, 48,000 graduate workers, postdoctoral researchers, and academic researchers at the University of California went on strike in the largest academic labor action in history (Toohey et al. 2022). The strike ended 40 days later, with a contract agreement that included codified raises from a previous minimum of around $23,250 to $34,000 effective as of 1 October 2024, increased childcare subsidies, and improved antibullying and harassment policies (Watanabe 2022, UAW 2865 2024). Although this outcome only partially addressed graduate workers' concerns (minimum guaranteed income remains below MIT living wage as described in figure 2), the strike pushed the negotiations toward more equitable and just working conditions.

When bargaining fails to reach agreements, strikes are sometimes implemented as a last resort. Strikes, however, are ineffective if they do not affect normal university function, which can be challenging for everyone at the university, including the striking workers, undergraduates, and the larger departmental community. As UC workers organized and underwent the 2022 strike, we found that, despite shared DEI goals, graduate workers in our department encountered difficulties fostering collective support from department members across different career stages. We highlight challenges this strike posed to the ecosystem of our department and suggest approaches to improve

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organizational strategies in life sciences departments on three levels: graduate worker organizing, impacts on undergraduate education, and departmental community. We also discuss perceived short- and long-term impacts on individuals across career stages (table 1).

This discussion is based on the experiences of our coauthor group during the 2022 UC academic worker strike. To generate additional reflections on departmental experiences, we also confidentially polled faculty, staff, postdoctoral researchers, graduate students, and undergraduates. We focus on how to build coalitions of support in departments during graduate worker strikes with the belief that the outcomes from these movements can improve conditions across career stages and contribute to a more equitable future for our field. We recognize that it may not be possible to eliminate all impacts during and following graduate labor strikes and that, as the graduate union landscape changes (e.g., the recent unionization of graduate researchers at some institutions), new challenges will appear that may require interventions not discussed in the present article. We present our lessons learned with the intent to progress approaches to address these impacts during future movements. We do not intend to capture the entirety of best practices for successful labor organizing, because many strategies are well established and used within unions (Davies and Mason 2023). Although we recognize concerns around capacity of funding to support improved graduate working conditions (table 1), we do not address administrative solutions because implementation of these changes is the responsibility of the institution. We instead focus on tools to address specific organizing challenges that arose within our department, with the hope that these reflections will help similar departments build coalitions and maintain community as they navigate the current labor climate.

## Graduate worker organizing

Effective strikes rely on strong coalitions among workers, with an emphasis on building and reinforcing a sense of community. Graduate students perform diverse types of labor and are funded in diverse ways, which can challenge attempts to develop unified guidelines for labor withholding across worker types. The 2022 UC strike was the first labor action in the United States with all graduate worker types represented by unions (Barajas 2021). Navigating this new dynamic required extensive planning, particularly within our department, in which many graduate workers are engaged in time-sensitive field and lab work.

During the 2022 UC strike, graduate students struggled to stay updated on rapidly evolving circumstances and to engage in the strike while facing conflicting pressures. Developing community support for long-term change was also challenged by the fact that graduate students are in their positions for a relatively short period of time and that graduate students near graduation would not experience direct benefits. To address these challenges, we designated trusted individuals within the department as departmental stewards for the union. These stewards liaised between the graduate student body and the union organizers to help maintain community and share accurate information. To assist the departmental stewards with labor-intensive tasks, we also formed graduate student organizing committees within the department. Despite these efforts, reaching all graduate workers was difficult. To streamline communication, we used information sessions, town halls, and dedicated communication channels to keep the graduate students informed. We emphasize that communication challenges during movements can be eased in part by proactively building a departmental understanding of the role of labor organizing and strikes in pushing for and realizing positive changes.

Achieving a unified strike in our department posed challenges because many graduate students were directly funded for research labor. For graduate workers paid for research unrelated to their theses, withholding this labor can strain the collaborative relationships with their research supervisors. For workers paid directly for their own thesis research (e.g., students on fellowships), labor withholding was additionally complicated. The movement organizers needed to identify where labor withholding would maximize pressure on the institution while minimizing personal loss (Mason 2023). Consequently, offering clear guidance to individual students in diverse funding situations became difficult, leading some students to feel isolated when union guidance did not fully address their challenges. Providing clear documents addressing the unique difficulties faced by life sciences researchers (e.g., protocols for live animal welfare and early notice of intention of a strike for time-sensitive field work) helped more researchers actively engage in the strike.

As students that face disproportionate barriers to degree completion, international students and graduate student parents may particularly stand to benefit from the outcomes of strikes, such that the inclusion of their voices in labor organizing is crucial to ensure that movements adequately organize to address their concerns. However, given the heightened severity of the conditions experienced by the students in these two groups, they may have limited bandwidth to engage in labor organizing and are in particularly precarious positions during strikes, which presents organizing challenges.

During the strike, it was crucial for the organizers to address the unique hurdles faced by international students and graduate student parents. Engaging parents was complicated because they had little free time or extra income. Visa precarity, fear of employer retaliation, and language barriers were additional pressures for international students, despite legal protection of the right to participate in strike action. We found that where international students and student parents were involved with organizing, their engagement helped attract other international students and student parents and ensured that support was tailored to their needs (e.g., childcare offered at the picket line and information on the legality of strike activity for international students). To cover the financial hardship of striking, the union provided stipends with additional hardship funds to support financially vulnerable groups such as student parents. International student and student parent organizers also played key communication roles, setting up forums for support during the strike and acting as intermediaries to bring questions and concerns to union organizers.

## Impacts on undergraduate education

Graduate students play a major role in undergraduate education (Herbert 2021), including by acting as mentors and providing research opportunities. Graduate students found it challenging to withhold labor that might affect undergraduate well-being. Despite these impacts, we observed significant undergraduate support for the strike, driven by shared values and challenges. In our experience, many undergraduates aspiring to careers in life sciences fields requiring graduate degrees recognized the long-term benefits of strikes.

The outcomes of contract negotiations often improve educational quality by increasing support for instructors (Brunner et al. 2020). However, undergraduate students will feel the impact

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**Table 1.** Examples of positive and negative perceived impacts (both short- and long-term) of graduate student labor organizing (including labor strikes) on undergraduate students, graduate students, faculty, and staff in life sciences departments.

| Departmental role | Short-term impacts | | Long-term impacts | |
|---|---|---|---|---|
| | Positive | Negative | Positive | Negative |
| Graduate workers | Improved coalition building and community with peers<br>Demonstration of graduate worker commitment to shared values of equitable working conditions<br>Increased visibility for challenges affecting those with excluded identities | Retaliation from supervisors<br>Lost pay during strike<br>Time away from dissertation<br>Loss of time-sensitive research or organism care<br>Concern for impacts on undergraduate students<br>Strained relations with peers and advisors over differences of opinion<br>Heightened stress | Increased wages<br>Improved protections against bullying and harassment<br>Improved childcare support<br>Improved support for international students<br>Improved healthcare coverage<br>Reduced stress and subsequent improvements to research and teaching quality<br>Improved health<br>Improved ability to plan for future<br>Solidarity and improved methods for future labor negotiations and organizing<br>More equitable and just field | Higher wages limit number of graduate student positions available at institutions<br>Increased undergraduate class sizes and workloads |
| Undergraduate students | Better understanding of working conditions and employment challenges of graduate school<br>Improved solidarity with peers and graduate workers | Delayed grades<br>Picket lines limiting access to campus<br>Reduced quality of education because of withheld labor<br>Heightened stress<br>Missed field and lab work opportunities | Improved quality of instruction and mentorship from graduate students<br>Undergraduates continuing on to graduate school will experience the benefits gained during movements<br>Self-efficacy to advocate for improved working conditions throughout a career<br>More equitable and just field | Increased undergraduate to graduate instructor ratio<br>Increased undergraduate tuition to offset increased costs of graduate student compensation<br>Increased competitiveness of graduate school applications because of fewer available graduate positions<br>Reduced available discussion sections |
| Faculty members | Improved coalition building with graduate students<br>Improved trust from graduate students in response to demonstrated support for graduate student well-being | [a]Concern for impacts on undergraduate students<br>Stress of adapting courses in response to struck labor<br>Negative student evaluations for courses, which could affect faculty promotions<br>Strained relationships with graduate students<br>Impacts on time-sensitive research or organism care<br>Difficulty navigating commitment to graduate students with guidance from upper administration | Greater ease recruiting and retaining diverse graduate students<br>Higher graduate student productivity facilitated by greater well-being<br>Community building, organizing, and solidarity can help support future faculty labor organizing<br>More equitable and just field | Increased onus on PIs to fund higher graduate salaries through grants<br>Increased labor burden placed on faculty in departmental leadership roles to restructure departmental funding to accommodate graduate raises<br>Reduction in number of graduate student TAs supporting courses taught by faculty |
| Postdoctoral researchers | Improved coalition building with graduate students<br>Improved solidarity with peers and graduate workers<br>Improved trust from graduate students in response to demonstrated support for graduate student well-being | Missed time networking or collaborating with graduate students<br>Shouldered burden of covering time-sensitive fieldwork or organism care because of withheld labor | Community building, organizing, and solidarity during graduate strikes help support future postdoctoral researcher labor organizing<br>More equitable and just field | Reduction in number of graduate student TAs assisting courses taught by postdocs |

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**Table 1.** Continued

| Departmental role | Short-term impacts | | Long-term impacts | |
|---|---|---|---|---|
| | Positive | Negative | Positive | Negative |
| Staff | Improved coalition building with graduate students<br>Improved trust from graduate students in response to demonstrated support for graduate student well-being | Additional burden of trying to mitigate impacts on undergraduate students and faculty<br>Concern for well-being of precarious graduate students<br>Strained relationships with graduate students and faculty over differences in opinion<br>For research staff, additional burden of covering time-sensitive fieldwork or organism care<br>Heightened stress due to difficulty navigating interpersonal relationships and coordinated institutional responses, e.g., insufficient campus and divisional guidance | Community building, organizing, and solidarity during graduate strikes can help support future staff labor organizing<br>More equitable and just field | Increased labor burden placed on departmental staff to restructure departmental funding to accommodate graduate raises<br>Amplified experience of inadequate staff working conditions in contrast to improved support for graduate students |

*Note:* This table summarizes coauthor experiences and perspectives, as well as experiences brought up in polls, about impacts or perceived potential impacts from those stages. We recognize that perspectives included in the present article may differ from those at other institutions and that individual context of different institutions and implementation of strikes and institutional response may heavily influence which impacts are felt during and following labor strikes. [a]All above impacts may be heightened for untenured faculty.

of struck instructor labor on their educational experiences and through restricted access to campus caused by picket lines. During the 2022 strike, graduate student workers struck for 3 weeks of instruction, 1 week of exams, and 1 week of postinstruction grading, affecting the quality of undergraduate education. In our experience, attempts to mitigate these effects by hiring outside labor or pivoting to virtual formats ineffectively substituted for struck labor and may have prolonged the strike by reducing its intensity.

We found that frequent communication helped to reduce stress among undergraduates when the instructors informed their students about the upcoming strikes and provided context regarding the movement's motivations and subsequent class disruptions. The strike presented opportunities for an open discussion of the barriers to success in academia, with some undergraduates citing that the movement improved their sense of community in our field. We recommend that graduate student organizers provide instructors with materials such as slide decks to present in their courses to provide updates to the undergraduates on the strike's status (e.g., what to expect from graduate student teaching assistants with respect to grading and section or lab instruction), that they ensure that up-to-date information is shared, and, where possible, that they create dedicated channels of communication with undergraduates to centralize the dissemination of information. We further recommend that graduate student organizers establish relationships with undergraduate organizers and implement structured communication before the strike to help address these challenges.

Withholding labor can lead to delays in grade submission, with resultant impacts on undergraduates. To address this, the organizers provided coordinated guidance in situations where the impacts of withholding grades could be mitigated (e.g., graduating students, students on academic probation, students who need to enroll in classes with prerequisites) in the form of impact mitigation flowcharts that were distributed to the graduate student instructors and question and answer sessions for the students and instructors. We recommend that graduate workers communicate with undergraduates early about grade delays, including exceptions for certain circumstances, and that they share updated information as the strike progresses. In addition, we highlight the importance of empathy in conversations with faculty and undergraduate students about their concerns.

Depending on how the administration chooses to resolve changes in labor compensation, improved graduate student working conditions could affect undergraduate tuition, class sizes, and student-to-instructor ratios. These outcomes are not the intent of contract negotiations, and we observed graduate students' support for responses that maintained the quality of instruction while providing better support for the instructors (e.g., for the administration to respond to increased wages by increase allocation of institutional funding toward support for teaching staff instead of reducing the number of teaching staff).

## Departmental community

Life sciences departments benefit from community cohesion and collaboration. Communication among faculty, graduate students, researchers, and departmental staff can be complicated by power dynamics; for example, a departmental union steward may feel unable to communicate openly at a faculty meeting if an unsupportive member of their dissertation committee is in attendance. Proactive, consistent, and empathetic communication among these groups is the strongest tool available to maintain community during strikes.

The impacts of a strike on research and teaching can create interpersonal difficulties that undermine the valued departmental sense of community. Faculty members may be able to empathize with the challenges experienced by graduate students on the basis of their own experience in graduate programs, with the graduate experiences of early-career faculty members frequently matching those of current students most closely. However, because faculty

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are in a different stage in their careers from graduate students, they face different pressures from their institutions, such as the responsibility for time-sensitive grant deliverables and the coordination of field seasons. Despite the likely heightened capacity of early-career faculty and those with excluded identities to empathize with graduate student experiences, the institutional pressures on these faculty members may be greater during strikes, especially for pretenure individuals and those who may disproportionately shoulder DEI initiatives and responsibilities based on their own identities. Institutions seeking to fracture support for striking student workers may take advantage of the precarious position of these individuals. Therefore, vocal support from later-career, tenured faculty within departmental conversations can give early-career faculty support to remain more engaged during strikes.

In our experience, community divisions arose from confusion between union demands and messaging from the UC. Faculty and staff were concerned about whether departments and PIs would be expected to secure funding for higher wages (Langin 2023). Further tensions arose around concern from faculty and other underpaid workers, such as departmental staff, who felt they had to shoulder the burden of covering struck work or face potential fallout from choosing not to (e.g., poor student evaluations). Faculty members and staff hold multiple roles in departments, frequently acting as instructors, researchers, and mentors, and they were torn between supporting research deliverables, their undergraduates' educational needs, and the graduate labor action. These uncertainties caused fatigue and disengagement as people balanced their personal values, their own work requirements, and support for the movement.

In our department, some graduate students feared that engaging with the strike action could damage their relationships with faculty, whereas some faculty feared that honest conversations about their concerns might provoke accusations of intimidation. Graduate student representatives maintained the primary dialogue with faculty and staff (e.g., raising concerns on behalf of graduate students at departmental meetings). Some faculty expressed that they appreciated this moderated approach, whereas others felt limited in their ability to communicate openly with their own students. Navigating these challenges was most successful when individuals exhibited empathy and respect toward the positionality of all involved. We suggest that departments consider making space for productive, multidirectional facilitated conversations leading up to and during strikes. These conversations may be effectively led by departmental union stewards (rank-and-file graduate workers within departments that act as liaisons between union organizers and departmental graduate workers) where they exist. However, where they do not or where there are concerns about the undue pressure these conversations may place on relationships across career stages within departments (e.g., if there are risks of retaliation for union involvement from supervisors or committee members of departmental union stewards), these conversations may be appropriately facilitated by rank-and-file stewards from other departments within the university or by paid union staff members. These union staff members can lead question and answer sessions and can provide documents that address faculty and staff inquiries while relieving pressure on departmental graduate students to develop the messaging. Coordination between graduate student unions and other worker organizations, including those of professors and lecturers, can clarify the support each group can provide, such as the right to respect picket lines. It may also be helpful to provide guidance across stages on common strike-breaking strategies that institutions may employ so that workers can be prepared to respond. We found that encouraging strategic lab group discussions about exceptions for activities that cannot be stopped (e.g., live animal care) was pragmatic, did not undermine striking activities, and helped maintain community.

To improve communication, it is essential to promote literacy about the utility and goals of strikes among department members of all career stages in advance of labor actions. In STEM (science, technology, engineering, and mathematics) departments, there may be less familiarity with labor organizing than in the social sciences. Despite a previous history of strikes at our campus (Cowan 2020), much of the communication about the 2022 strike did not occur until it was underway. We recommend proactive prioritization of labor discussions in departments, such as periodic reading groups, committee meetings, or seminars, to encourage open dialogue on how improving working conditions for all worker types aligns with broader shared goals of DEI.

Some of the pushback from faculty and staff revolved around the potential impacts of increased graduate student salaries on staff salaries, the number of graduate student positions, and undergraduate tuition. The finances of public education are challenging, and responding to potential impacts (e.g., budget cuts or flat salaries for other workers within institutions) requires labor literacy and organizing across job titles to make shared demands on the institution. In addition, increasing compensation for educators in general can provide greater opportunities for individuals to build careers in this critical but underpaid profession (García and Weiss 2019). This includes university teaching staff, such as lecturers and nontenured faculty (American Federation of Teachers 2020), and extends to graduate student workers.

Although it may be challenging for faculty, staff, and postdocs in life sciences departments to visibly support labor actions, given their multiple responsibilities, we observed that vocal support for graduate student strikes and recognition of graduate working conditions fostered departmental cohesion with graduate students. Visible actions by faculty that powerfully communicated support for the graduate students included signed letters, presence at the picket line, and not covering labor struck by graduate students (e.g., leading discussion sections or grading). Cohesion was further improved when the graduate students recognized the faculty who supported the strike. This support also demonstrates recognition of the broader positive impact of labor rights for DEI and the health of academic communities, improving trust and community within departments.

## Conclusions

Although graduate students are considered important sources of teaching and future research innovation, many institutions create inequitable working conditions for graduate students (e.g., financial precarity, low support for student parents), which disproportionately act as barriers to retention and success for students with excluded identities. Labor organizing works to improve working conditions and financial security, complementing existing DEI efforts to improve access to and retention in graduate programs. As a result of the 2022 strike, the UAW and UC negotiated new contracts for graduate and postdoctoral workers and academic researchers, although not all workers felt their concerns were adequately addressed by the new contract, particularly given that the needs of graduate students vary across campuses (e.g., based on local costs of living). Still, the new contracts resulted in increases in compensation and improved health and childcare benefits (Hubler 2022), contributing to reducing

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financial precarity, improving protections for harassment and bullying, and increasing access to benefits for graduate workers and researchers at the UC. This progress, although it is limited, suggests that labor actions may continue and increase at the UCs and beyond in coming years (Herbert et al. 2024). Since the resolution of the strike, we experienced improved communication channels between faculty and the graduate student body within our department. From our perspectives, individuals who experienced the strike have also shown an improved understanding of labor literacy in subsequent labor issues, and an increased willingness to engage in difficult conversations related to labor and academia. The knowledge gained from these experiences and shared in the present article can be useful for future student and researcher organizers and life sciences departments seeking to proactively prepare for academic movements to be most effective.

Labor actions can present challenges because of the dual role of graduate students as students and workers, the importance of departmental collaboration, and repercussions to other early-career-stage individuals. We highlight lessons learned from these experiences and emphasize that life sciences departments can support a diverse and equitable future by improving literacy on the utility of unionization and labor organizing to advance DEI initiatives and encouraging open conversations about how the impacts felt by strikes are components of their capacity to affect systemic change. In sharing our experiences during the largest academic strike in history, we aim to use our perspectives to aid communication, empathy, and labor literacy in life sciences departments navigating future labor actions to improve graduate workplace conditions and reduce barriers to equity in life sciences career paths.

## Supplemental material

Supplemental data are available at *BIOSCI* online.

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## Statement on positionality

We are a group of graduate and undergraduate students, postdoctoral scholars, staff, and faculty members predominantly from the Ecology and Evolutionary Biology Department at UC Santa Cruz. Coauthors from this department also hold numerous other identities (e.g., gender, race, socioeconomic class, disability, parental status) that inform our experiences as reflected in this article. Additional coauthors have contributed their experience in other life sciences departments, or in labor movement research and union organizing at UC Santa Cruz.

Following our commitment toward inclusive perspectives, we have chosen to use "excluded identities" (Bhatti 2021) to refer to groups that have been historically excluded in US educational systems, in place of more common terms such as *underrepresented minorities* that are widely used but gloss over important nuances (e.g., solving the issue of proportional representation doesn't equate to creating an inclusive workplace (Walden et al. 2018)). We recognize that a vast array of lived experiences are encompassed by the umbrella term of "excluded identities" and that people often have multiple intersecting identities. Where possible, we have used terminology specific to the identities to which we refer, but have selected this term to refer generally to individuals with identities that institutions structurally fail to support.

The recommendations that we outline in this article are based on our experiences during the University of California, Santa Cruz 2022 labor strike that was part of the larger strike of graduate students, postdoctoral researchers, and academic researchers

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throughout the UC system. The local context of this movement may differ from that at other institutions, and we therefore recognize that not all of our recommendations will apply to future movements. However, we have focused our discussion around experiences that we believe are broadly applicable to life sciences departments beyond the UC system.

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