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Improving academic mentorship practices

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Mentorship from experienced peers critically improves individual career development and satisfaction in academia, but we have little information on how researchers are supported. We identify and recommend strategies for faculty members, departments, institutions and funders to ensure sustained excellence in academic mentorship.

At all career stages, mentorship strengthens the performance, confidence and general well-being of mentees as they progress on their academic journeys. This leads to tangible benefits, which include higher career satisfaction[1], increased self-efficacy[2], an expanded professional network, greater likelihood of obtaining funding and improved retention in academia[3]. A number of studies have assessed the efficacy of mentorship practices and how trainee and faculty mentees perceive their professional mentorship[1,3,4], which reveals that mentoring experiences are not homogeneous. For example, recent studies have shown that many faculty mentees sourced multiple mentors, whereas the majority of trainee mentees relied on a single primary mentor[3,4]. Further, faculty mentees reported higher satisfaction with the mentorship they received, relative to trainee mentees[3,4]. Developing constructive and individually tailored mentorship initiatives will provide stronger and more consistent mentorship and support for trainees and faculty members. Such initiatives should build upon current and perceived mentoring practices and how they do (and do not) work.

Experiences of academic mentees

We surveyed 457 faculty members and 2,114 graduate and postdoctoral researchers worldwide regarding their mentorship experiences. Although our sample is a convenience sample and thus not representative of all disciplines and nationalities, it covers multiple disciplines, countries and regions. Thus, it provides valuable insights into mentee experiences beyond single disciplines and nationalities, and points to the need for further systematic surveys with the funding for representative sampling. According to our data[3] and our non-peer-reviewed preprint[4], up to a quarter of academics may not have mentors nor have contact with former mentors, and thus lack the benefits that mentorship can provide. Academics in North America and Europe report higher access to faculty mentoring programmes and also seek more mentors compared to mentees in Latin America, Africa, Asia and Oceania. Such data highlight potential cultural differences in academic mentoring practices and probably point to important considerations in the perceptions and effective implementation of mentorship strategies[3].

Despite its clear benefits, persistent challenges in faculty-to-trainee and faculty-to-faculty mentorship remain. Our survey indicates that faculty mentors struggle to provide sufficient support to their mentees (graduate and postdoctoral researchers, as well as junior faculty members) owing to a lack of bandwidth[4]. Even academics who are satisfied with their mentorship at the faculty level report that various aspects of their mentorship relationships could improve. The most prominent areas of dissatisfaction include adequately addressing work–life balance, promoting networking, providing training in mentorship and grant writing, and helping faculty to strategize their career goals[3]. Additionally, improvements in access to mentorship would promote equity, as substantial variabilities exist across institutions with regard to their commitment to faculty mentors and mentees alike.

Potential issues faced by mentors

Studies of mentorship practices often focus on the evaluation of mentorship from the viewpoints of mentee researchers rather than the perceptions of their senior colleagues who have the role of faculty mentors[4]. Many mentees report that their mentorship experience could be improved; however, the underlying causes of suboptimal mentorship from faculty vary. For example, mentees identify a lack of commitment, poor communication, conflicts of interest or the mentor's lack of experience as negative mentorship issues[3]. Such observations indicate a need for faculty mentorship training, which can define mentor competencies and ensure that faculty mentors understand mentee needs and challenges. Additionally, faculty members face challenges of limited protected time for mentorship and minimal relief from administrative and service duties to cultivate mentoring relationships. Typically, institutions and funders have failed to adequately recognize and reward mentorship[5], and many faculty members who spend less time on service activities (including mentorship) advance to full professorship more quickly than those who dedicate time to service. Burnout probably also contributes to suboptimal mentorship, as post-tenure faculty members must increase teaching, service and administrative duties, which renders the very faculty members who are most qualified to be mentors the least available to perform this critical task.

Improving mentorship for trainees

Understanding the needs of mentees and mentors, and the systematic challenges that they face, can help to improve mentorship. Trainees particularly rely upon mentorship, yet may be unable or unlikely to express their mentorship needs. To overcome this, faculty mentors and department leadership can run periodic anonymous laboratory surveys to gauge what members think about various aspects of research and laboratory culture, and how mentors can provide the best support. A laboratory welcome letter and handbook – complete with expectations and composed by the principal investigator – could help with trainee management and mentorship[6]. Mentees also need to make an effort towards managing academic expectations, particularly as they progress towards independence[7]. For example, mentees should communicate priorities, and discuss these with their mentor as mentorship interactions evolve.

Mentors should honestly evaluate their capacity to provide meaningful guidance and support to trainees in their laboratory. This could involve either limiting the number of scientists under their direct supervision or establishing supportive networks within their

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Desired mentor qualities (trainee mentees)

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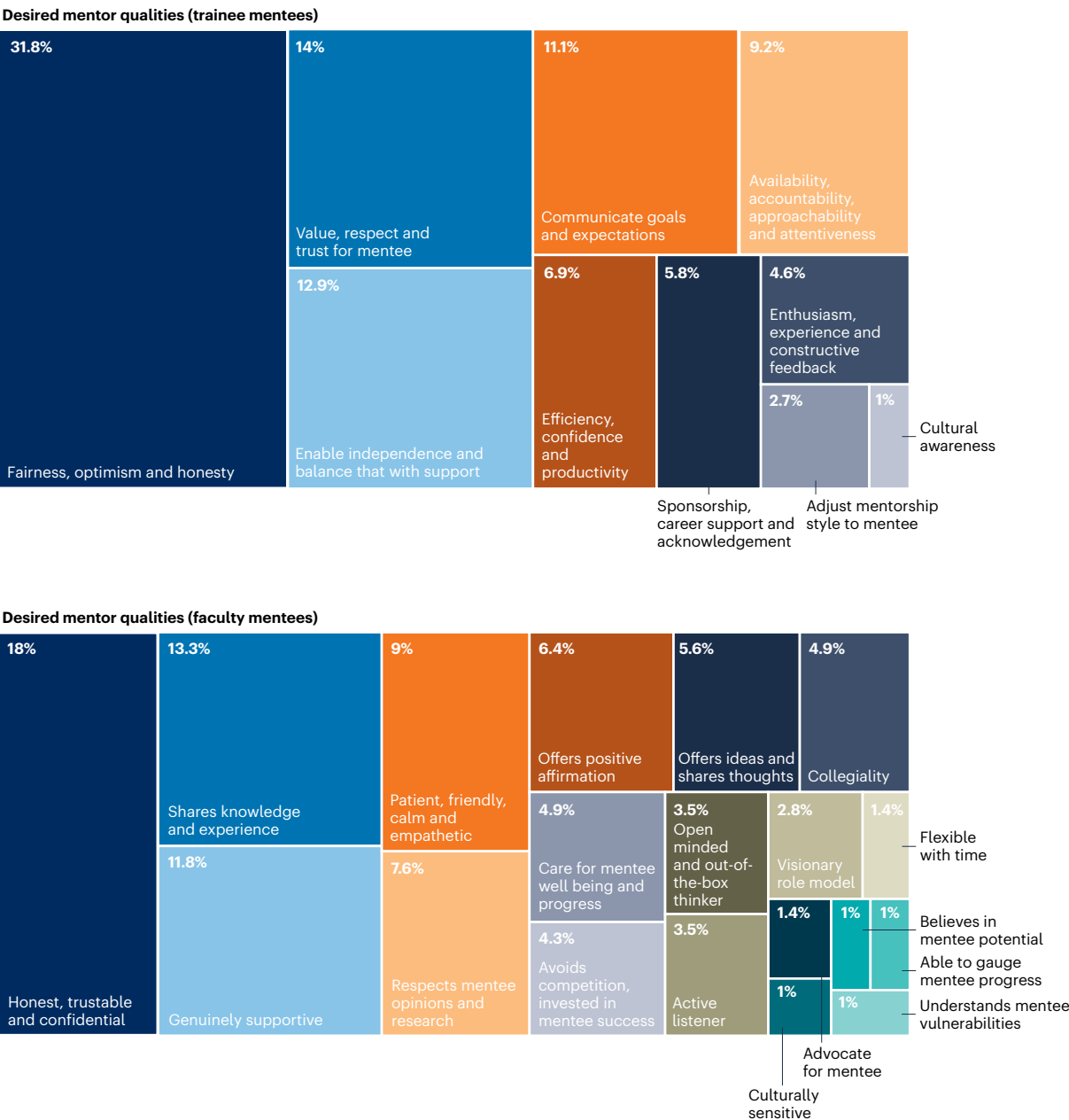
Fig. 1 | Summary of key desired mentorship qualities noted by faculty and trainee mentees. a,b, Percentage of mentee respondents on key aspects of their mentorship that they found essential, aggregated as mentorship qualities reported by trainee mentees (**a**) and faculty mentees (**b**)[3,4].

laboratories, such as teams of senior and junior laboratory members, to facilitate mentee success. Conversely, a large laboratory size could open new opportunities for co-mentorship, which provides valuable training at all career stages. Principal investigators should recognize the need to alter their mentorship strategy on the basis of growth or shrinkage in their laboratories and additionally consider that their current mentorship model may not scale, particularly as the laboratory grows. Laboratories should regularly and jointly assess mentoring successes and failures for continuous improvement. In the area of mentoring trainees, mentorship shortcomings may be driven by

both a lack of mentorship training for principal investigators and by systemic challenges. For instance, tying graduate and postdoctoral training to specific grant funding may incentivize certain poor mentoring practices, such as prioritizing grant progress over mentee independence[4].

For mentees, finding all of the necessary expertise and guidance in a single advisor is unlikely, yet this represents the typical mentorship model for academic trainees[4]. Trainees may face challenges in initiating interactions or sourcing mentorship with faculty members beyond their advisor. Department leadership, scientific societies, graduate
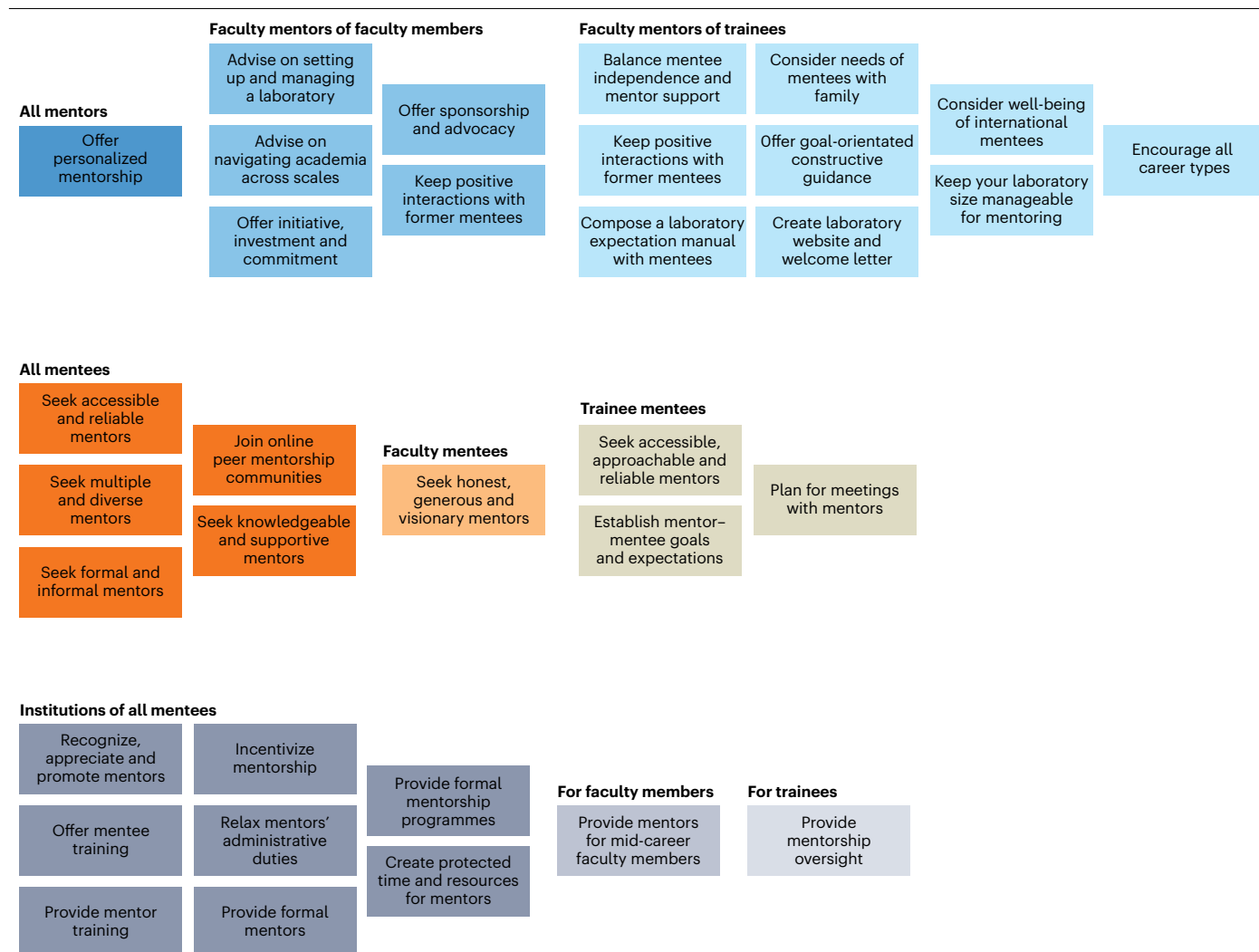
Fig. 2 | Recommendations for stakeholders to improve mentorship practices. Summary of recommendations for trainee and faculty mentees to be implemented by their mentors, departments, institutions and funders.

training programmes and postdoctoral associations could facilitate such interactions or provide diverse perspectives to help trainees' scientific and career development. Mentees should seek and secure the mentorship they need, both from their dissertation committees and external colleagues. Doctoral thesis committees could provide mentorship beyond scientific oversight – for instance, by promoting professional development opportunities or expanding the network of the trainee. Such proactive actions would boost trainee confidence and secure guidance from diverse mentors, ranging from peers to faculty members. Online communities of graduate and postdoctoral researchers such as Grad Slack and the Future PI Slack may not replace primary mentors, but may help to complement mentorship offered by faculty advisors (Fig. 1).

Notably, mentoring effectiveness can differ from the benefits perceived by the mentee. For instance, mentees may feel supported when their level of mentorship does not actually effectively shape their career. To address this, mentorship evaluations of the perceptions of mentorship effectiveness could be tracked against

objective measurements[8]. Defining objective measures constitutes a challenge, but mentors and institutions could assess dropout rates from high-stress or toxic environments as a proxy for trainee dissatisfaction.

Improving mentorship for faculty members

Just as trainees face distinct challenges in sourcing effective mentorship, faculty mentees indicate that their mentorship could improve in several ways[3]. One relatively straightforward improvement could involve sourcing multiple mentors – both formal and informal – to provide advice on diverse aspects of becoming a group leader. For instance, although survey findings suggest that junior faculty members would benefit from a mentor within their department to navigate institutional guidelines and politics, they would additionally benefit from a senior external mentor within their field to identify opportunities for networking and exposure, and to promote their research programme[3]. Additionally, junior faculty members could benefit from a cohort of informal peer mentors who share resources and offer mutual learning

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on laboratory management, grant writing and managing work–life balance[9]. As these roles cannot be fulfilled by a single person, having access to a mentorship team to navigate the academic faculty experience would hold high value for junior faculty members[3]. Obtaining diverse perspectives could mitigate a lack of expertise from any one mentor, especially when selected across genders (for example, both men and women serving as mentors), location (that is, local and distant institutions) and career history (for example, retaining mentors from previous institutions). Mentees with mentoring teams may selectively approach individual mentors with specific expertise, depending on the question or problem they face. Joining online communities of early- and mid-career faculty members may also the complement key mentorship activities of mentees (Fig. 2).

Departments can also improve faculty mentorship, particularly by promoting continuous and dynamic conversations on mentorship among colleagues and their university administration rather than a 'one size fits all' mentorship solution. Institutions should cultivate quality mentoring relationships, as opposed to merely assigning faculty mentor(s) in the department. As there will be variations in mentee needs and mentor skills and knowledge, care should be taken to match junior faculty members with senior faculty members who can promote a positive mentoring experience by consulting junior faculty members on their needs and soliciting their opinion (or, minimally, their approval) of proposed mentors. Thus, higher education and funding institutions should allocate time and resources to promote mentorship so that implementing recommendations for best mentoring practices become feasible and not a burden to overwhelmed faculty members. For example, institutions could create protected time to ensure quality mentorship and reinforce its value, and departments could further incentivize quality mentorship by including mentorship metrics as permanent components of hiring and funding decisions. Department leadership also could include mentorship evaluation in tenure and promotion rubrics[10,11]. Given the importance of mentorship to early- and mid-career faculty members for increasing their performance, satisfaction and retention, departments and institutions would strongly benefit from incentivizing mentorship programmes and relationships for senior faculty members[10,11].

Given the demand for mentors in the same speciality, and for at least some mentors outside of the institutional hierarchy, scientific societies could organize mentoring between universities or across geographical regions. Furthermore, a number of prominent mentorship issues could be addressed by departmental and institutional leadership reevaluating their mentoring programmes. Although faculty mentorship programmes may be new concepts in many institutions worldwide, many faculty members value mentorship as among the most important factors in their long-term success and retention. Thus, investing in the short-term efforts of ensuring proper mentorship of junior faculty members will probably result in substantial long-term gains for institutions.

Conclusion

Alongside departmental and institutional mechanisms, improving trainee and faculty mentorship should include listening to early and mid-career colleagues and appreciating their specific needs. Mentors can help to launch the careers of their colleagues by suggesting that talented students apply to their mentees' laboratories, helping to grow their networks of colleagues or recommending them for invited talks. By listening to the mentee's needs instead of enforcing the mentor's own ideas for their development, they will instil a culture of effective mentorship that could be perpetuated when newer faculty members ultimately become mentors themselves, which will create a sustainably supportive academic environment. Ongoing conversations on mentor and mentee roles, expectations, and best practices can further alleviate issues before they arise.

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Competing interest
The authors declare no competing interests.