

Great Expectations: Principal Investigator and Trainee Perspectives on Hiring, Supervision, and Mentoring

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A functioning mentor–trainee relationship is of high importance in academia. Discrepancies in expectations between principal investigators (PIs) and trainees are a source of misunderstandings and conflicts, endangering scientific progress and career advancement. In this pilot study, we sought to explore the expectations of PIs and trainees, providing consensus data from physician–scientists and junior researchers who attended an educational workshop, entitled “The EASL/AASLD Masterclass,” in December 2017. Twenty-three Masterclass attendees, comprising nine trainees (four Ph.D. candidates, five postdoctoral researchers) and 14 PIs, responded to an online survey. Both parties were asked to score 29 predefined statements of important expectations, enabling a comparative analysis for each statement between the groups. For the trainees, the success of the PI, either mirrored by successful mentoring or scientific work, as well as a clear road for academic development are of utmost importance. PIs did not prioritize these aspects, highlighting discrepancies of expectations. PIs prioritized trainee competence, reliability, and strong daily initiative/work ethic, qualities that were also recognized to be important by the trainee group but not to same degree as PIs. *Conclusion:* Discrepancies in expectations pose a preventable threat to the mentor–trainee relationship if considered and discussed beforehand. The discrepancy in the most common expectations between the two groups could have resulted from the fact that trainees prioritize outcomes of success while PIs focus on the necessary qualities leading to those outcomes. (*Hepatology Communications* 2018;2:999–1004)

THE MENTOR–MENTEE RELATIONSHIP IN ACADEMIA

Preparation for an academic research career involves a long road with multiple challenges. After graduation from university, many academic researchers find themselves faced with a formidable challenge of finding the right environment for pursuing an advanced degree, postdoctoral training, and the transition to independence. The German term

“Doktorvater” or Ph.D. supervisor literally translates to “the father of the Ph.D. student” and poetically epitomizes the importance of the mentee–mentor relationship in academia. Principal investigators (PIs) expect trainees to possess a set of qualities when they apply for scientific training, including honesty, ethics, competence, and a strong work ethic. These virtues form the basis for a research career of academic integrity, leading hopefully to a successful thesis and strong publication record.⁽¹⁾ The Ph.D. student’s work should

Abbreviations: AASLD, American Association for the Study of Liver Diseases; EASL, European Association for the Study of the Liver; PI, principal investigator.

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be organized, transparent, and well documented and is expected to command considerable problem-solving skills and a high frustration tolerance.

Likewise, Ph.D. students have a major goal in common, which is the completion of their Ph.D. thesis, with candidates choosing an attractive project directed by an inspiring and encouraging mentor. For the Ph.D. student, a clear road to the thesis, positive working atmosphere, and availability of infrastructure and resources to guide growing academic independence might be decisive factors in selecting a supervisor. Just as teenagers blossom into adults, over time, Ph.D. candidates need to renegotiate the terms of their relationship with their PI.⁽²⁾ As PIs foster scientific independence and maturity in their team members, they need to gradually give them free reign as the trainee approaches the end of training.

Once Ph.D. candidates graduate and move on to becoming postdoctoral researchers, the relationship with their PIs changes dramatically. Postdoctoral researchers demand more independence, less guidance, and a working alliance on a more equal footing.⁽³⁾ A healthy relationship should be symbiotic where both parties benefit from each other. In “The Evolution of Postdocs,” Stinger et al.⁽⁴⁾ state that a hallmark for a good mentor is their honesty with each postdoctoral student about their talents, accomplishments, and potential because postdoctoral researchers tend to prefer direct feedback on their performance.

PIs as the leaders of the team have multiple duties and are not uncommonly overburdened with work. This is especially true for clinical scientists when the PI runs a laboratory in parallel with clinical obligations,⁽⁵⁾ with expectations in both “worlds” rising substantially compared to just 10 years ago. PIs need to provide the

infrastructure required for the group to conduct their research, including securing grant funding and providing proper training. However, PIs currently spend significantly more time in grant writing activities than years ago because competition for funding is far greater than in previous years. Furthermore, research grant dollar amount has remained overall stagnant, often-times not offsetting the increase in salaries, reagents, and other resource costs that drive demands for more clinical productivity. Thus, one could speculate that there is less time for direct supervision and mentoring compared to decades ago, despite a fundamental need to continue to foster the mentor–mentee relationship. Successful PIs foster their postdoctoral researchers’ experiences outside the laboratory to broaden their aspirations. In return, the postdoctoral researcher is expected to be the workhorse of the team, delivering high-quality research that is published jointly with the mentor. In addition, as researchers undergoing advanced training, postdoctoral researchers are expected to supervise junior members (e.g., Ph.D. candidates, undergraduate students) in the laboratory.^(4,6)

When expectations on both sides have not thoroughly been discussed beforehand, misunderstandings arise, endangering the trust of the PI–trainee relationship. To address these gaps in understanding, in December 2017, junior investigators from both sides of the Atlantic participated in a unique 2-day, intensive, educational collaboration, entitled “The Masterclass.” They received training in basic, translational, and clinical liver-related research led by eminent clinical scientists from the European Association for the Study of the Liver (EASL) and the American Association for the Study of Liver Diseases (AASLD). The event included interactive small-group workshop sessions to discuss

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relevant topics in more depth. In one of these interactive sessions, entitled “Hiring and supervising research team members,” expectations of PIs toward trainees (e.g., Ph.D. candidates or postdoctoral researchers) and vice versa were debated. It quickly became evident that many of the discrepancies in expectations between them, highlighted above, might be a source of conflict and misunderstanding,⁽⁷⁾ with the potential to negatively impact scientific progress and career advancement. Because these issues affect nearly everyone in academia, we sought a broader consensus about the workshop findings from all Masterclass attendees through a follow-up online survey.

Materials and Methods

Using initial findings from the workshop debate, we sought to ascertain the most important expectations of PIs and trainees by creating an online survey of all Masterclass attendees. Qualitative findings from the workshop discussions were transcribed during the sessions and then used to inform the creation of an online survey (Supporting Table S1). Participants were asked to score 29 predefined statements comprising 14 points focused on the trainee’s expectations and the remaining 15 statements representing the PI’s expectations.

Respondents were asked to answer all 29 questions, enabling a comparative analysis for each statement. In this exploratory analysis, the calculated *P* values serve as an indicator for level of agreement ($P = 0$ or 1) between the PIs and trainees expectations. Specifically, *P* values of 1 or 0 reflect absolute agreement or nonagreement, respectively. *P* values were not adjusted for multiple testing because they would exhibit tendencies rather than significances. Mann-Whitney U tests for significance were used.

Results

From 36 Masterclass participants, 23 (64%) completed the follow-up online survey, including nine trainees (four Ph.D. candidates, five postdoctoral researchers) and 14 PIs (Fig. 1).

The most important expectations between PIs and their trainees appear to be distinct. Trainees’ expectations focused on the PI’s track record for successful mentoring (rank 1; Fig. 2A), road to independence to establish their own group (rank 2), and overall career success of the PI (rank 4), whereas PIs appear to not

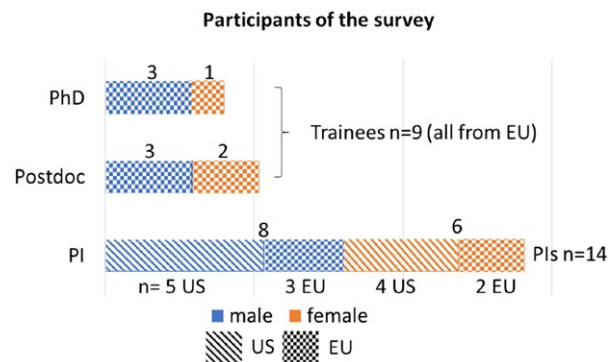


FIG. 1. Number and sex of Masterclass participants in the online survey, comprising 14 PIs, (nine from the United States plus five from the European Union) and nine European trainees (four Ph.D. candidates and five postdoctoral researchers). Abbreviations: EU, European Union; US, United States.

prioritize these aspects (group accordance, $P = 0.083$ [rank 1] and $P = 0.179$ [rank 2]). Interestingly, the online survey results show that the trainees attribute the same level of importance to the PI’s track record for successful mentoring and to the PI’s success while the PIs appear to give more importance to the PI’s success than to his/her track record for successful mentoring (Fig. 2A).

When it comes to finances, trainees are in agreement with PIs ($P = 0.734$) that monetary incentives, such as salary (rank 14) or the certainty of a continuous working contract (rank 12) are less important; these statements received the lowest score by both trainees and PIs (Fig. 2A). There are no sex-related differences for trainees concerning their expectations as suggested by the high *P* values (Supporting Fig. S1). However, responses of male trainees regarding the most important expectation of PIs “Initiative/work ethics day-to-day of the employee” are heterogeneous compared to their female counterparts, who are in good agreement with their PIs (rank 1, $P = 0.095$; Supporting Fig. S1).

PIs’ expectations consist of daily initiative/work ethic and competence of their trainees (ranks 1, 2; Fig. 2B). Additionally, PIs appreciate mentee’s honesty and transparency as well as self-awareness (ranks 3, 4). These four statements were also recognized to be important by trainees. Statements of PIs from the United States are in agreement with their European colleagues except for ranks 4 and 5 concerning the expectations of PIs. Here, PIs from the United States were firmer about the importance of these statements than their European counterparts, who tended to be

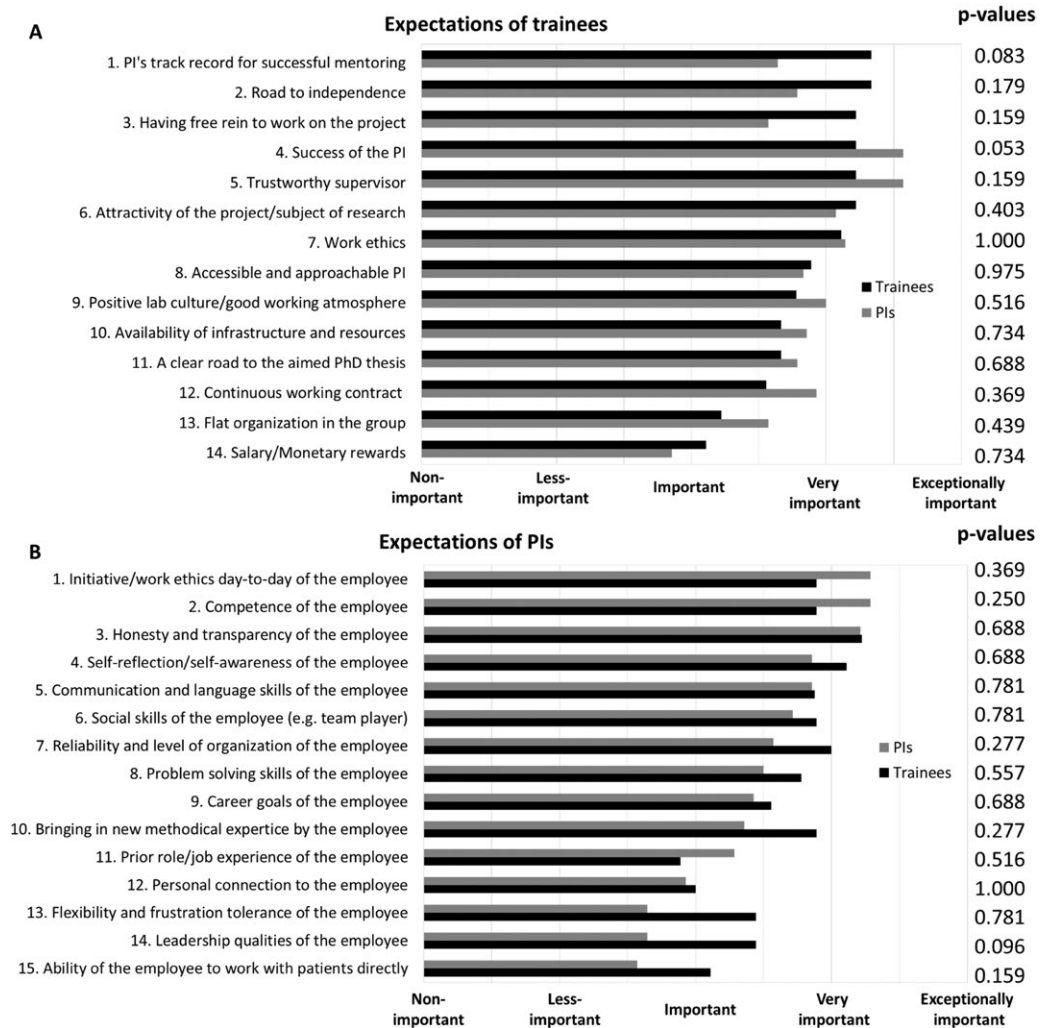


FIG. 2. Outcome of the online survey. (A) Expectations of trainees (postdoctoral researchers and Ph.D. candidates) toward their future PI. (B) Expectations of PIs toward their future trainees. Masterclass attendees (total 23, comprising 14 PIs and three Ph.D. candidates/six postdoctoral researchers) rated 29 predefined statements of important expectations from nonimportant to exceptionally important. Results are the numeric average of the given answers. Calculation responses were converted to numbers, using the following scale: “nonimportant” = 1, “less important” = 2, “important” = 3, “very important” = 4 and “exceptionally important” = 5. P values calculated using Mann-Whitney U test indicate group accordance between trainees and PIs, where $P = 1$ or 0 reflect absolute agreement or noagreement, respectively.

more flexible on these two points (ranks 4 and 5 for expectation of PIs, $P = 0.042$ and $P = 0.083$, respectively; Supporting Fig. S2).

Discussion

This pilot study, designed to investigate the expectations of PIs and trainees, highlights the potential discrepancy of expectations between these two parties. The mentor–mentee relationship between the PI and

the trainee is undoubtedly a unique relationship and goes beyond a pure working alliance. A positive relationship has a long-lasting influence on the mentee and sets the course for a successful academic career. For the PI, a motivated and passionate mentee represents a valuable partner in the rewarding scientific process.

For the mentee, the success of the PI is of utmost importance, whether attributed to successful trainee mentoring or scientific work. Hence, PIs should keep in mind that beside their scientific accomplishments, their track record and reputation for successful mentoring

are appealing factors for trainees. Furthermore, young scientists seeking an academic career are aware of the competitive environment and greatly appreciate a mentor who articulates a clear road to independence and at the same time provides personalized guidance to the trainee.

PIs expect their trainees to possess established values and virtues when they apply for a position, virtues that are critical to success. Interestingly, the discrepancy in expectations might be best explained by noting that trainees focused on outcomes of success while PIs focused on the necessary attributes leading to those outcomes (e.g., the process of success). Trainees should be willing to be hardworking, honest, and self-reflective, eager to contribute new insights in their field, leaving no doubt of their integrity and honesty. In return, PIs are lenient with their mentees if features, such as frustration tolerance as well as leadership qualities, are not perfectly formed right from the beginning of the training. In a way, this relationship might be seen as the first “collaboration” of the mentee, which, to be rewarding and long-lasting, needs to be beneficial to both sides.

We acknowledge that this study is limited by representing a small subset of physician-scientists and/or researchers in clinical departments that might affect its generalization to other areas of investigation. Thus,

future studies are required to provide further insight into the mentor–mentee relationship and respective expectations that might lead to new approaches and strategies. Collectively, our findings should encourage PIs and trainees to carefully explore their reciprocal expectations before embarking on the mentor–mentee relationship, thus enabling a solid base for a future scientific cooperation that is mutually beneficial.

Epilogue

THE EASL–AASLD MASTERCLASS EXPERIENCE

Lastly, we would like to emphasize that the inaugural EASL–AASLD Masterclass in 2017 (Fig. 3) was a unique educational event for young investigators to learn from and informally interact with leaders in the field of hepatology. This 2-day program at Chateau de Guermantes, in the Parisian countryside, provided a casual atmosphere to hold academic lectures, interactive sessions, and individual meetings while enjoying French gastronomy and hospitality.

Taken together, this workshop was a great setting for comparing and contrasting the European and American health care, research funding, and training systems for effective networking and for developing



FIG. 3. Inaugural 2017 EASL–AASLD Masterclass group photograph (Copyright EASL Geneva, Switzerland).

lifelong collaborations and friendships. We strongly encourage young investigators interested in basic, translational, and clinical liver research to apply and attend this unique opportunity!

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Supporting Information

Additional Supporting Information may be found at onlinelibrary.wiley.com/doi/10.1002/hep4.1205/full.