

Expectations Life Sciences Doctoral Students Have of Undergraduate Researchers

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OVERVIEW: In a national survey of US life sciences doctoral students, we probed the skills, behaviors, and values that they believed undergraduate researchers should embody to integrate into the scientific community.

AUDIENCE: Doctoral advisors, Researchers/Researcher supervisors.

KEY POINTS

- Doctoral students often serve as immediate mentors to undergraduate researchers in the life sciences.
- Doctoral students described that undergraduate researchers should effectively communicate, demonstrate a strong work ethic, and be driven by an intrinsic passion for research.
- Doctoral student demographic characteristics predicted the characteristics they appreciated in undergraduate researchers.

INTRODUCTION: At research-intensive institutions, doctoral students often assume a prominent role in mentoring undergraduate researchers. Thus, they play an important role in bringing undergraduates into scientific communities of practice. The expectations and qualities of undergraduate researchers that doctoral students appreciate are not well-documented, but likely play a pivotal role in undergraduates' experiences in research. We surveyed 835 life sciences doctoral students who had mentored or would eventually mentor undergraduate researchers. We assessed what qualities and beliefs they appreciate in undergraduate researchers and what advice they would give to undergraduate students to maximize their experiences in research. Using inductive coding, we analyzed doctoral students' open-ended responses. We also identified specific rules (e.g., communicate effectively), roles (e.g., demonstrate a strong work ethic), and values (e.g., be driven by intrinsic passion) that doctoral students shared. We used logistic regression to determine whether demographics predicted differences among doctoral student responses.

FINDINGS: Doctoral students described appreciating intrinsic passion, effective communication, and diligence among undergraduates. When asked to provide advice to undergraduate researchers, doctoral students recommended that they communicate with

lab members, identify how research will benefit them, and put effort into research. We found that gender, race/ethnicity, and college generation status predicted what rules, roles, and values doctoral students appreciated and advised undergraduates to adopt these same values. For example, women were more likely than men to offer advice on being diligent and fostering positive dynamics within the lab.

TAKEAWAYS: This research illuminates what rules, roles, and values undergraduate researchers are expected to uphold and identifies relationships between mentor identities and the advice they pass on to students. These qualities that doctoral students appreciate and aim to instill in undergraduate researchers may be helpful for undergraduates looking to pursue research experiences to help them maximize their experiences. Future critiques of these rules, roles, and values can help to create a more inclusive scientific community.

Full Title: The Scientific Rules, Roles, and Values that Life Sciences Doctoral Students Want to See Upheld by Undergraduate Researchers