Abstract 1506

Advocacy to address postdocs' needs and challenges at Brigham and Women's Hospital

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As part of the ASBMB Advocacy Training Program, I advocated for improved working and living experiences for postdoctoral fellows (postdocs) at Brigham and Women's Hospital (BWH). BWH's world-class research is driven by the 750 dedicated postdocs tirelessly performing experiments, running clinical trials, applying for funding, training the next generations of scientists, and at the same time, producing high-impact scientific articles. However, BWH postdocs are also experiencing financial insecurities, insufficient professional development, lack of job security and career advancement, and – for international postdocs, lack of transparency in visa sponsorship. These stresses have led to increased burnout among postdocs, forcing many, especially parents and those from underrepresented minorities, to quit the research they love. As the co-chair of the postdoc advocacy committee at BWH, I worked with a dedicated team to carry out the first annual survey of postdocs' needs and challenges. The lessons I acquired from ASBMB Advocacy Training Program ensured that the survey was inclusive, covered critical areas of need, and reached all postdocs at BWH. After 1 month, we obtained responses from 315 postdocs (42% response rate). As predicted, postdocs expressed the greatest stress over financial insecurities. On average, the monthly spending exactly matched the after-tax income, leaving little for emergencies or savings. Unexpectedly, 28.9% of postdocs reported being paid below BWH's required minimum, which is already 10–20% less than many neighboring institutions. Postdocs also expressed concerns over the lack of structured mentoring and professional development, with 78.6% reported not having done an annual performance review in 2022. Other concerns include perceived second-class employee status, visa sponsorship delays, and a lack of community spirit, PI oversight, and work-life balance. With this data, our advocacy committee is facilitating discussions between the BWH postdoc community and BWH leadership to brainstorm and implement changes. Our data will also assist our collaborative efforts with other postdoc associations in Boston to drive regional and national changes. Most postdocs would agree that they are passionate about solving biological puzzles and finding treatments to alleviate human suffering. This work - designing, analyzing, and disseminating the survey data, convinces me that postdocs can have the same passion and impact when directed toward our own burdens.

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Abstract 1531

Facilitating the collaborative scientific process through an interdisciplinary undergraduate protein modeling course

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An instructional model has been developed at Nova Southeastern University (NSU) through the Farquhar Honors College, whereby undergraduate students gain experience in protein modeling to describe a molecular story early in their undergraduate studies. Initially run as an independent study course for a few students at a time, the experience developed into an interdisciplinary course with co-taught by faculty from the Department of Biological Sciences and the Department of Chemistry and Physics. Coursework was developed with support from protein modeling workshops (https://3dmoleculardesigns.com/) and the NSF-funded CREST (Connecting Researchers, Educators, and STudents) Program https://crestresources.org/. This course is available to students regardless of major, academic level, or previous college-level experience and has run for two semesters (Fall 21 and Fall 22). In Fall 2022, 14 students registered for the course: 14% were freshmen, 36% were juniors, and 50% were seniors. The 14 students belonged to 5 major programs: Biology (58%), Neuroscience (21%), Chemistry (7%), Marine Biology (7%), and Psychology (7%). Five project groups (of no more than 3 students each) were tasked with researching and developing a molecular story that would be enhanced by a 3D-printed model. Each group was composed of students from varying academic levels and majors to facilitate a collaborative, project-based team learning approach. Students were provided a course-based research experience using various protein-focused bioinformatics tools: Jmol, PyMOL, Autodock Vina, and the Protein Data Bank. Six undergraduate peer mentors who previously participated in a protein modeling project assisted each group with accessing protein modeling tools, and in how to use protein modeling to tell a molecular story. Of the fall 2022 peer mentors were 67% seniors and 33% were juniors. Class sessions and assignments were modeled after research lab experience at the undergraduate and graduate levels. Students presented their progress several times during the semester and received feedback on their projects from instructors, peer mentors, and classmates All finished projects included a protein model description sheet, poster, oral presentations, Jmol script, and 3-D printed protein model. Fall 2022 Student projects included molecular stories related to Alzheimer's Disease amyloid plaque antibodies as well as BACE1 inhibitors, MCAD deficiency, PCSK9 inhibitors, and ω-conotoxin interactions with voltage-dependent calcium channels. Primary literature, course materials, and protein modeling tools provided students with the ability to learn the scientific process, apply it to understand

molecular mechanisms, and present their model descriptions to others. To better understand student learning gained as part of this experience, an altered RISC (Research on the Integrated Science Curriculum) Survey was administered at the end of the semester. Students showcase their models and protein stories to other researchers through the NSU library-sponsored website: https://nsuworks.nova.edu/protein_modeling_reports/. Many past participants have presented their work at local, national, and international conferences. This course represents a successful example of a course-based undergraduate research opportunity (CURE) that can be replicated in a wide variety of institutions and provide research opportunities for many students.

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Abstract 1536

Evaluating Biomolecular Visual Literacy: A Library of Classroom-Tested Assessments for Instructor Use

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BioMolViz is a community of instructors and assessment experts working to evaluate and improve visual literacy in the molecular biosciences. For a decade, the team has supported biomolecular visualization instruction by establishing a Framework (biomolviz.org/framework) and developing NSF-funded workshops that train instructors to write assessments. The Biomolecular Visualization Framework outlines overarching themes, learning goals, and learning objectives for the targeted assessment of visual literacy, and was crafted collaboratively with input from the biochemistry and molecular biology (BMB) education community. BioMolViz workshops train instructors to use the Framework for backward design of assessments that probe students' visual literacy skills. Through this work, we have developed a five-step process for assessment validation involving iterative revision and expert panel review. Here, we report on the validation of 15 assessments that have undergone the classroom testing stage of our process. Assessment items were distributed to students at several institutions to broaden the range of instructional contexts and types of courses surveyed. We present analysis of the data from our field testing, including student responses regarding perceived difficulty and open-ended feedback. These assessments are among the first available in the BioMolViz library, a repository designed to increase instructors' access to validated visual literacy assessment tools. We will demonstrate its key features and invite the BMB educator community to use and contribute to the library.

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