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Teaching Biomolecular Visualization Literacy: Guidelines for Developing Assessments, Images and Rubrics Aligned with the BioMolViz Framework

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Abstract

Experts in the life sciences glean critical information from biomolecular visualizations. When teaching, we assume our students grasp the concepts in these depictions of biomolecules in the same way that experts do. However, biomolecular visualization (BMV) skills must be intentionally taught and assessed to gauge student understanding. To identify misperceptions and assess comprehension, BioMolViz developed a framework outlining the required skills for biomolecular visualization literacy. Over the past four years, BioMolViz conducted numerous workshops to engage the broader community in creating assessments aligned with the BMV framework, with the goal of developing a repository of validated assessments that can be used by the broader community. Workshops were shifted to an online format during the COVID-19 pandemic, and a new working group emerged, the BioMolViz Fellows. This subset of workshop participants continued writing and revising assessments remotely, augmenting the group's peer review and validation process. Our workshops and the ongoing work of the Fellows generated over 200 assessments at various stages in our validation process, with 80 that underwent at least two rounds of revision, and 27 assessments are pending review by an external expert panel. Here, the Fellows present guidelines for generating excellent images using popular visualization

software, such as PyMOL, Chimera, and iCn3d. We also provide tips and tricks for designing or reframing questions and rubrics to help instructors maximize student understanding of important biomolecular concepts. Fellows crafted these guidelines using the BMV framework coupled with the lessons learned through workshops.

If you are interested in joining our growing community of professionals dedicated to improving BMV instruction, then we'd be delighted to connect with you.

This is the full abstract presented at the Experimental Biology meeting and is only available in HTML format. There are no additional versions or additional content available for this abstract.



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