

June 17, 2024

NIGMS Program Evaluations Team
National Institutes of Health
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RE: NIGMS Mature Synchrotron Program Evaluation

The American Society for Biochemistry and Molecular Biology is an international nonprofit scientific and educational organization that represents more than 12,000 students, researchers, educators and industry professionals. The ASBMB strongly advocates for strengthening the science, technology, engineering and mathematics (STEM) workforce, supporting sustainable funding for the American research enterprise, ensuring diversity, equity, accessibility and inclusion (DEAI) in STEM, and addressing emerging issues in the scientific enterprise.

The National Institute of General Medical Sciences published a [request for information](#) on May 17 seeking input for its Mature Synchrotron Program (MSR) Evaluation.

The ASBMB public affairs department has worked closely with ASBMB members funded by NIGMS and with the ASBMB Public Affairs Advisory Committee to provide the following comments and recommendations according to the prompts provided in the RFI.

1. Perceived benefits of the MSR program

The MSR program is an essential support mechanism to help sustain the “mature” synchrotron beamlines that support the large community of structural biologists to advance the atomic-level understanding of macromolecular structure in the context of ongoing functional studies. These beamlines are an unrivaled resource of technology for structural biology and provide access to state-of-the-art technology for data collection that simply cannot be done at many institutions. The beamlines have well established processes and procedures that provide expertise and great remote-access operations to its users, creating a solid model for long-distance, collaborative research and training.

Another benefit of the MSR program is the retention of specialized staff. Staff with decades of specialized expertise are essential to making intricate instrumentation work properly. In the past, talented staff have been lost during transitional periods at beamlines or synchrotrons, e.g. beamlines that have had lapses/changes in NIH funding or those impacted by prolonged downtimes for repair or construction.

2. Perceived challenges facing the MSR program

Sustained and diversified funding has been a challenge due to the increased costs of research and decreasing budgets. It’s important to underscore that the Department of Energy has [substantially](#)

dropped its level of financial support for the beamlines over time, shifting an increasingly higher percentage of usage costs to partners.

3. *Availability and quality of state-of-the-art technology at the synchrotron resources*

The national synchrotrons often have been at the forefront of new technological breakthroughs (e.g. SAXS, time-resolved crystallography, enabling determination of high- and higher-resolution structures, etc.). It's important that the synchrotrons continue to have the resources to remain at the cutting-edge of technology.

4. *Availability and quality of the training in the use of the synchrotron resource technologies*

The availability of training and quality of the training at synchrotrons has been outstanding. The workshops, on-site training and strong communication with users with the remote data collection program are well curated and have made them popular resources among synchrotron users.

5. *Availability and quality of the training in data analysis methods and/or software use offered as a part of the MSR program*

Similar to the availability of training for the synchrotron resource technologies, the availability of training and quality of the training in data analysis methods and/or software use has been outstanding. The workshops, on-site training and strong communication with users with their remote data collection program are well curated and have made them popular among many users.

6. *Suggested approaches for improving the MSR program to better serve the research community*

The ASBMB suggests that NIGMS collaborate with scientific societies, including the ASBMB, host webinars, and participate in other events to inform the broader scientific community about the resources provided by the MSR program.

7. *Relative use of synchrotron resources for structural biology research in comparison to non-synchrotron-based structural biology techniques and technologies*

The structural biology community will continue to need access to both crystallography and cryo-EM resources at the national and/or regional level.

8. *Expected future level of need for NIGMS-supported synchrotron resources*

To best capture the need for the NIGMS-supported synchrotron resources, the ASBMB recommends that NIGMS conduct an analysis of the number users requesting access to each of the NIGMS-supported beamlines to determine which synchrotrons are used more heavily than others. In addition, the society recommends that an expert, data-informed panel redistribute use of different synchrotron resources.

9. *Any other relevant topics for NIGMS to consider in the evaluation of the MSR program*

Community engagement is needed, as the field of structural biology is undergoing major changes with both experimental methods (cryo-EM, cryo-ET, mass spec) and methods such as AI emerge. The ASBMB would like to emphasize the importance of community engagement with broad representation from different types of institutions including R2 and research active institutions.