Maximizing Shared Research Resources

Part I: Recommendations from the Federation of American Societies for Experimental Biology

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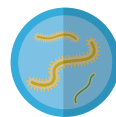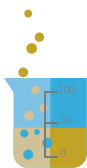
Executive Summary and Recommendations

Shared research resources make efficient use of research funds and broaden access to advanced technologies. Through shared resource facilities, the research community can promote rigorous research practices, quality technical training, and collaborative research. The Federation of American Societies for Experimental Biology (FASEB) used a survey to collect the perspectives of shared resource users and providers regarding the challenges they faced.

The survey results demonstrated the value shared resources provide to the research community, including cost savings and greater access to advanced technologies and materials. Shared resource facilities—such as cores, stock centers, and user facilities at the National Laboratories—generate further benefits by offering specialized expertise, leading technology development, acting as a nexus for collaboration and team science, and providing technical training.

However, shared resource providers face a variety of challenges that limit their ability to consistently offer cutting-edge services to scientists. Through analysis of survey responses,[1] FASEB identified four key areas for improvement: funding and business operations; discoverability and access; ability to meet evolving needs; and facility career track and staff development.

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[1] See Maximizing Shared Research Resources, Part II: Survey Findings and Analysis

Recommendations to Improve the Funding and Business Operations of Shared Resource Facilities

Stable and predictable budgets enable facilities to operate efficiently and maintain high standards. In turn, this reduces the cost of conducting cutting-edge research and provides greater reliability for users. However, survey results demonstrated high variability in the way each facility is supported. The lack of clear expectations for each stakeholder group contributes to funding gaps and financial instability. Respondents also described widespread unmet needs for the types of resources typically provided through facilities, and many were concerned that federal grant programs fail to take full advantage of existing resources and infrastructure.

1. **Create better business models for shared resource facilities:** The research community should develop clear funding models for facilities, including aligned expectations for institutional and sponsor support. Different models will be needed for different types of technologies and services.

   Institutions can improve the business operations of their own facilities by:

   - Establishing a dedicated fund for resource repair, replacement, and upgrades;

   - Centralizing common administrative tasks for facilities, such as accounting and billing;

   - Minimizing "red tape" that prevents or hinders facilities from offering paid services to researchers outside of their centers, departments, or institutions, including to researchers located at for-profit entities; and

   - Seeking state funding to build local biotech capacity through facilities.

2. **Enhance funding programs that support facilities:** To maximize the federal investment in research, federal agencies should strengthen existing resource programs and explore strategies that promote resource efficiency by:

   - Reviewing and realigning shared resource funding mechanisms with investigator demand and existing facility infrastructure;

   - Determining under what sets of circumstances regional cores can more effectively and efficiently meet research needs beyond institutional facilities and establishing funding mechanisms for these cases;

- Ensuring support for the maintenance of sponsored equipment (i.e., a service contract or a dedicated account for repairs), whether through direct funding, institutional matches, or other approaches;

- Identifying ways to encourage research grant recipients to use shared resources, such as budgeting for facility use in grant applications; and

- Coordinating support with other sponsors (inter- and intra-agency as well as non-governmental organizations) to avoid unnecessary duplication and promote broader access.

Recommendations to Increase the Discoverability and Access of Shared Resources

To maximize shared resources, investigators must be able to easily discover and access them. A number of survey respondents struggled to find a facility that met their needs. Many indicated that their institution provides limited support to help researchers locate internal resources. Similarly, beyond word-of-mouth and online searches, investigators rarely reported other approaches that would help them find a facility outside their institution. Access is also a challenge; just under half of survey respondents indicated that, within the past five years, they had wanted to utilize a facility but were unable to do so. The most common reason provided was an inability to afford facility fees. Written comments often described a "catch-22" cycle of being unable to collect pilot data for a grant application due to facility costs, and thus unable to secure a grant without that preliminary data.

3. **Increase national awareness of shared resources:** Federal agencies should support the creation of a national database of facilities and similar shared resources. To further raise awareness, research sponsors can provide or support opportunities for grantees and trainees to learn about the latest technologies and how to apply them to their research projects.

4. **Connect researchers with institutional resources:** To make their research programs more competitive, institutions should ensure that their investigators can find and utilize the resources they need by:

- Maintaining a user-friendly list or database of institutional and regional shared resources;

- Creating an office or point person for facility coordination and conducting outreach to institutional researchers;

- Including information about shared resources in orientation programs for graduate students, postdocs, laboratory staff, and new faculty as well as in materials provided to grant recipients;

- Supporting facility outreach efforts to attract new users, which should at least include each facility maintaining a user-friendly website containing key information such as available equipment, contact information, and sample acknowledgment text;

- Offering facility vouchers in start-up packages, bridge funding, and other forms of investigator support; and

- Establishing cooperative agreements for utilizing facilities located at neighboring institutions and, as appropriate, partnering with them to create regional facilities.

5. **Overcome cost barriers for investigators:** Research sponsors should consider establishing funding mechanisms that defray costs for unfunded investigators, scientists at less research-intensive institutions, and other researchers who would otherwise be unable to utilize a facility. Institutions can offer support for pilot projects and larger studies, such as through competitive applications for internal subsidies that are applied to facilities fees.

Recommendations to Better Meet Evolving Resource Needs

For a facility to be of value to its users, it must evolve to meet changing needs. Directors bear great responsibility for keeping their facilities current and relevant, but many reported struggles to secure funding for that purpose. Survey respondents called for greater coordination among federal agencies to improve the allocation of resource support, thereby increasing the efficacy of

the federal investment in research. Likewise, many respondents noted that facility support and oversight was handled inconsistently or in an ad hoc manner across their institutions, resulting in suboptimal allocation of funds and other support. Surveyed facility personnel also reported pressure to maximize billable activities, sometimes at the expense of improving services and developing staff expertise.

6. **Coordinate federal support for shared resources:** Research agencies should develop a joint national strategy to optimally support shared resources. Most of these resources are used in multiple fields of research, so coordination makes sense and would lead to more efficient use of shared resource dollars.

7. **Conduct strategic planning at the institutional level:** Long-term planning can help ensure appropriate deployment and support of internal resources, including resource investments made outside of facilities. As part of a robust strategic planning effort, institutions should assess investigators' needs and determine:

    • What new types of resources are required;

    • What existing resources need to be upgraded or replaced within the next several years;

    • Which facilities or technologies are becoming obsolete; and

    • What benchmarks could be used to assess if a facility is meeting its objectives.

    A shared resources advisory group can be used to oversee the implementation of this strategic plan as well as facility assessments. Membership should draw upon facility directors and staff, faculty, and institutional leadership.

8. **Keep expertise and services current:** Institutions should ensure facility personnel have sufficient protected time to keep up with developments in their field or technology area and incorporate them into the range of services provided. Likewise, facility directors should regularly communicate with their user base to identify emerging needs and ensure their facilities remain user-centered.

Recommendations to Professionalize Careers in Shared Resources

Resource providers, including facility personnel, work on a variety of research projects, offering their expertise to other scientists as well as developing new technologies and methods; their contributions to research should be recognized. But the survey responses suggest that this career track tends to be under-recognized and undervalued. Facility directors described difficulty retaining trained staff due to uncompetitive compensation and benefits packages, job insecurity, limited opportunities for career advancement, and a lack of professional development. Without greater support, it will be difficult to recruit and retain skilled personnel.

9. **Ensure recognition of facilities and facility personnel:** Investigators should acknowledge use of facilities or shared resources in relevant scientific communications, including grant applications. When preparing manuscripts, investigators should also consider if the contributions of facility personnel merit co-authorship. Institutions and publishers should take steps to promote appropriate acknowledgment.

10. **Professionalize the facility career track:** All stakeholders can contribute to the professionalization of this important, but often overlooked, career track.

    - Institutions should develop and adopt strategies to provide greater job security for facility personnel. If one does not already exist, institutions should establish a professional track with a clear advancement pathway for core scientists.

    - Research sponsors can increase stability by establishing partial or full salary support mechanisms for facility directors and staff. To promote excellence in this career path, sponsors can also offer training and development grants for facility personnel.

    - Scientific societies should work with other stakeholders to increase awareness and recognition of core facility scientists as a viable professional scientific career.

Supporting information for these recommendations can be found in:

- Maximizing Shared Research Resources, Part II: Survey Findings and Analysis

- Maximizing Shared Research Resources, Appendices A and B