



FASEB

Federation of American Societies
for Experimental Biology

Representing Over 130,000 Researchers

February 4, 2020

Stephanie Murphy, VMD, PhD
Director, Division of Comparative Medicine
Office of Research Infrastructure Programs
6701 Democracy Boulevard
Bethesda, Maryland 20892

Malgorzata M. Klosek, PhD
Director, Division of Construction and
Instruments
Office of Research Infrastructure Programs
6701 Democracy Boulevard
Bethesda, Maryland 20892

Transmitted electronically via portals: <https://orip.nih.gov/SPRFIDCM> and
<https://orip.nih.gov/SPRFIDCI>

Dear Drs. Murphy and Klosek,

The Federation of American Societies for Experimental Biology (FASEB) appreciates the opportunity to provide feedback on the recent Request for Information (RFI) ([NOT-OD-02-050](#)) seeking input on the Fiscal Year 2021-2025 Strategic Plan for the Office of Research Infrastructure Programs (ORIP): Division of Comparative Medicine (DCM) and Division of Construction and Instruments (DCI) Programs. This RFI is especially pertinent to FASEB, a coalition of 28 member societies representing over 130,000 biological and biomedical scientists and engineers who utilize animal model and core facility resources on a daily basis. We recognize that this RFI solicits feedback on two separate divisions; however, given the interconnectedness of these issues, this response jointly addresses the DCM and DCI program areas.

Animal Resources and Biomaterials

Viability, Utility, and Access to Animal Models

FASEB applauds the efforts of ORIP to identify, implement, and improve access to current and emerging animal models as these resources are essential for researchers to conduct fundamental and disease-related research. To advance these priorities in a cost-efficient manner, we strongly encourage ORIP to utilize and integrate the shared resources offered by DCI within DCM programs when appropriate. Coordination of resources will mutually benefit each division, improve the quality of research, and drive innovation forward.

Furthermore, we recommend ORIP foster partnerships across different NIH Institutes. For example, a collaboration with the National Institutes of General Medical Sciences' (NIGMS) research organism program could support access to and funding for a wide range of animal models, including [rare research organisms](#). Such a partnership aligns with ORIP's trans-NIH mission, and facilitates efforts to increase scientific rigor by reducing variation between research programs. Moreover, ORIP should also consider creating resources that can address the unique challenges intrinsic to research with non-traditional models. For example, investigators utilizing pregnant sheep consume a significant amount of time and resources when protecting for Q-fever. Providing mechanisms for supplemental funding that allow investigators to sufficiently prepare and oversee activities that influence the welfare of unique animals will enhance data

Full members: The American Physiological Society • American Society for Biochemistry and Molecular Biology • American Society for Pharmacology and Experimental Therapeutics • American Society for Investigative Pathology • American Society for Nutrition • The American Association of Immunologists • American Association for Anatomy Society for Developmental Biology • American Peptide Society • Association of Biomolecular Resource Facilities • The American Society for Bone and Mineral Research American Society for Clinical Investigation • Society for the Study of Reproduction • The Society for Birth Defects Research & Prevention • The Endocrine Society • American College of Sports Medicine • Genetics Society of America • The Histochemical Society • Society for Glycobiology • Association for Molecular Pathology • Society for Redox Biology and Medicine • Society For Experimental Biology and Medicine • American Aging Association • U. S. Human Proteome Organization • Society of Toxicology • Society for Leukocyte Biology • American Federation for Medical Research **Associate members:** The American Society of Human Genetics

collection and promote safe laboratory practices. A second challenge pertains to aging animals, which require specific care and expertise. Resources such as the National Institute on Aging's [Nathan Shock Centers of Excellence in the Basic Biology of Aging](#) provide valuable services for investigators studying the mechanisms of aging. As research increasingly shows age to play a role in the progression of numerous diseases, we urge ORIP to guide researchers to appropriate resources in order to enhance experimental design and sustain scientific progress.

A central component for fulfilling ORIP's goal to improve the utility of new and existing animal models is the humane transport of research animals. The existing refusal of certain airlines to transport animals for research purposes will severely limit the functionality of ORIP-supported repositories and we hope that NIH will partner with FASEB and other stakeholders to ensure the availability of safe and humane transportation options for laboratory animals.

Centralized Repositories

ORIP-supported centralized resources such as the Mutant Mouse Regional Resource Center and the Nonhuman Primate Research Centers provide access and expertise to resources vital to biomedical research. FASEB strongly encourages continued support of these centralized resources.

Similarly, ORIP may want to develop a regional and/or central repository for tissue samples from various animal species, comparable to the [NIH NeuroBioBank](#), a centralized location that facilitates the distribution of high-quality human post-mortem brain tissue to the research community. Access to tissues across a wide range of animal models will encourage researchers to supplement studies with other animal models, thus supporting rigorous experimental design and expediting translational discovery. To accomplish this, FASEB encourages ORIP to provide funding mechanisms to support infrastructure development, allowing institutions to upgrade, renovate, or build new facilities to accommodate for large-scale tissue storage. Additionally, we invite ORIP to partner with professional societies such as FASEB to raise awareness about the availability and applicability of these resources for cross-cutting research.

The Shared Instrumentation for Animal Research (SIFAR) grant is a valuable component to the S10 Shared Instrumentation Program. However, one of the ongoing challenges for SIFAR-funded researchers is the inability to use funds to purchase data analysis software unless it is integrated into the instrument's machinery. This technology is a necessary tool that enables scientists to generate and utilize large sets of data from animal experiments, consistent with the purpose of the SIFAR Program. Therefore, we urge ORIP to broaden its instrumentation requirements to include state-of-the-art data analysis technologies.

Informatic Resources

Freely available informatic resources play an integral role in facilitating data sharing and cross-disciplinary collaboration. Moreover, centralized centers such as [NCI's Informatic Technology for Cancer Research](#) (ITCR) serve to integrate informatic technologies and various types of data to address research questions across the research spectrum. To enhance the value of data obtained from animal studies, FASEB recommends adopting a similar model to NCI's ITCR that can provide both the resources necessary for multi-disciplinary collaboration, as well the opportunity for investigators to conduct computational, data-driven research.

Given the variability in data collection, curation, and analysis across institutions and core facilities, we recommend developing guidance that outlines best practices for data management across scientific communities, as delineated in the [ORIP 2016 RFI Executive Summary](#) (NOT-OD-16-091). Although FASEB was unable to comment, we agree with many of these recommendations and support the establishment of clear and consistent guidelines that will help facilitate high quality and reproducible biomedical research.

Impact of Animal Resources

ORIP-funded animal resources serve a fundamental role in basic scientific discovery and translational

research. In particular, the Nonhuman Primate Research Centers (NPRCs) provide the research community the ability to conduct life-saving non-human primate research efficiently and humanely.

These national resources have been essential in developing treatments for devastating diseases such as Parkinson's Disease, HIV/AIDS, and more recently sickle-cell anemia. Nonhuman primates remain a critical resource for research. The [2018 ORIP Report](#), "Nonhuman Primate Evaluation and Analysis" noted that the demand for macaques and marmosets is expected to increase in the next five years (Part 1, page 10). The report further stipulates that NPRCs provide access to valuable resources for investigators whose institutions are unable to house nonhuman primates. FASEB wishes to reinforce these conclusions, and urges ORIP to continue supporting the NPRCs to the fullest extent possible.

Increased reliance on nonhuman primates will necessitate additional infrastructure and a larger veterinary workforce to ensure appropriate animal care. Therefore, we recommend that ORIP provide sufficient infrastructure mechanisms, such as [G20](#), that allow institutions to construct new facilities and/or renovate current facilities to appropriate standards.

Training

Career Development

As animal research and technology becomes more sophisticated, it is equally important to ensure that the veterinary workforce and core facility staff are adequately trained and supported as valued members of the research enterprise. The collaborative and cross-disciplinary nature of biomedical research requires proper lab animal expertise and strong core facility leadership. Therefore, to fully maximize funding investments, it is essential for ORIP to devote resources to the career advancement of veterinary and core personnel.

FASEB was pleased to see ORIP's recent implementation of the T32 and K01 mechanisms for veterinary students and graduate veterinarians, as suggested in our prior comments (see attachment). We encourage continued support for these programs, and also recommend the creation of a Research Specialist Award similar to that offered by the National Cancer Institute ([R50](#)). Extending professional development support to veterinarians and core facility directors will attract and maintain the best scientists within the research pipeline by providing trainees additional time and independence to pursue research interests with career continuity.

Instrumentation

Emerging Technologies

FASEB appreciates ORIP's efforts to engage with the research community regarding instrumentation and technology requirements to reflect the rapidly evolving research landscape. At many universities, cores are administratively supported by—and located in—laboratory space associated with departments. This infrastructural organization creates fragmentation, unnecessary competition, duplication of instruments/services, challenges to research administrators responsible for core investments, and potentially an environment of "every core for itself". To help remedy this, and consistent with ORIP's endeavors to support trans-NIH initiatives, we encourage ORIP to partner with NIGMS to offer mechanisms that support [regional instrumentation centers](#). NIGMS's recent efforts to expand access to cryogenic electron microscopy (cryo-EM) technology are laudable, and we encourage ORIP to support this venture with additional instrumentations such as single-cell sequencing, spectral cytometry, and large animal transgenics.

An ongoing challenge among investigators interested in gaining access to a regional cryo-EM center is the steep difference in fees between institutional and third-party users. Such discrepancies limit productivity and frequently results in duplicative services/instruments at proximal locations. Therefore, we advise ORIP to implement a policy that incentivizes institutions to set consistent rates for both inside and outside users. Coupling cost-sharing mechanisms with ORIP priorities will foster inter-institutional

collaboration and enable core administrators to leverage existing resources.

Short- and Long-term Effects of the Shared Instrumentation Program

The Shared Instrumentation Program (S10) continues to make positive impacts within the research community, and FASEB thanks ORIP for its steadfast support. Supporting widespread access to state-of-the-art instrumentation promotes collaboration and enhances experimental reliability, consistent with ORIP's commitment to increase scientific rigor and reproducibility.

While the S10 program has strengthened core facilities in numerous ways, these grant mechanisms tend to favor large institutions. Smaller-scale institutions are unable to compete due to lack of resources and insufficient infrastructure. Accordingly, this is an opportunity for ORIP to serve as a leader on this issue, and address the needs of less competitive institutions. One way to accomplish this involves partnering with NIGMS and offering states that participate in the Institutional Development Award network (e.g. IDeA state) a reduced rate of institutional support. Interagency partnerships such as those with the National Science Foundation (NSF) are also worth pursuing as this will boost monetary support for NSF-funded institutions, and accelerate the transition from basic science to clinical application.

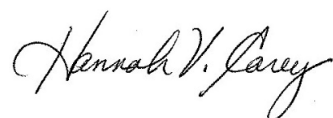
Finally, ORIP should consider expanding the S10 program to include inter-institutional applications. Not only will such funding opportunities foster cross-disciplinary collaboration, it will also contribute to the establishment of regional resource centers as described in previous sections, and bolster the competitiveness of smaller institutions.

Physical Infrastructure

Presently, research cores are unable to consolidate resources due to limited space. Physical integration of cores would synergize staff talent, reduce duplicative services, improve user access (e.g. "one-stop-shop"), modernize infrastructure, and increase capacity for emerging technologies and growing workforce. To further optimize the effectiveness of core facility operations, funding agencies such as ORIP should consider providing funding specifically for construction or renovation of research buildings to house centralized cores, similar to the one-time program NIH initiated utilizing funds from the [American Recovery and Reinvestment Act \(ARRA\)](#).

FASEB appreciates the opportunity to provide feedback on this RFI and looks forward to future engagement with ORIP regarding ways to foster scientific discovery by strengthening animal and shared instrumentation resources. Furthermore, we commend ORIP for its efforts to improve rigor and reproducibility, and encourage ORIP to tailor future program initiatives in accordance with the upcoming recommendations set forth by the recently established Advisory Committee to the Director Working Group, "[Enhancing Reproductivity and Rigor in Animal Research](#)."

Sincerely,



Hannah V. Carey, PhD
FASEB President

Cc: James M. Anderson, MD, PhD
Jon Lorsch, PhD