

Concept Clearance – Modernization of Biomedical Research Facilities Grant Program

Modern physical infrastructure is indispensable for the advancement of biomedical research. Every laboratory space or animal facility employs a broad range of technical solutions to create well-controlled environments and protected spaces furnished with equipment and tools that enable a broad range of research and research-related activities. ORIP's Division of Construction and Instruments (DCI) supports programs that improve existing and create new biomedical research facilities, and that fund acquisition of state-of-the-art scientific instruments. The proposed concept of Modernization of Biomedical Research Facilities will serve as a foundation for new opportunities to update existing research facilities by modernizing their physical infrastructure. The concept complements DCI's other two programs by focusing on improvements of operations and functions of research facilities, in contrast to creating new building infrastructure and to providing access to advanced scientific instruments. Any such modernization project must be located in an institutional animal research facility, a core facility, or other shared use space that provides access and services to many researchers, so that a sizeable local research community will draw long-term benefits from updated operations and functions.

One goal is to improve or streamline operating procedures and processes in laboratories and in animal research facilities through investments in physical infrastructure. Also, remodeling space and providing access to efficient equipment can expand the capacity of essential support-services for growing research programs. Refurbishing space, updating building systems, and acquiring and installing novel equipment necessary to support and conduct specialized research-related activities are just a few examples of projects within the scope of this concept. Its implementation can lead to improved and accelerated operations, functions, and services of biomedical research facilities. Linking the proposed physical infrastructure updates to demands of research and research-related activities will optimize the investment, serving NIH-supported extramural investigators and the biomedical research community.

Animal research facilities are one important class of research infrastructure that would significantly benefit from implementation of this concept. Improvements of the building systems, such as updating HVAC units to provide better controls of the environmental parameters and reduce noise levels, is one example of how modern infrastructure contributes to better habitats for laboratory animals. In parallel, enclosures with behavioral enhancements for non-human primate models, ventilated cages for rodent facilities, and modern aquatic systems with water quality assessment equipment will advance the care and management of animals. Added-on automated feeding systems further improve the quality of husbandry by assuring consistency and accuracy, resulting in well-defined animal models needed for robust and replicable experimental outcomes.

Similarly, without access to modern research facilities with controlled environments and suitable space furnished with specialized equipment, many research and research-required functions are not feasible. For example, shielded rooms are necessary to provide protected space for proper functioning of MR and PET imagers and electron microscopes. Updating electrical systems is vital to power freezers and cryopreservation equipment without which many laboratories cannot function.

The development of this concept has been stimulated by the outcomes of several [workshops and meetings](#)^{1, 2, 3, 4} that ORIP organized or co-sponsored in the last few years, as well as the responses to a Request for Information that ORIP issued in connection to formulating its next strategic plan. A common message from different groups of stakeholders is the need for additional NIH investment in physical infrastructure and modern technologies to upgrade research-related functions of biomedical facilities. Such needs fit in the gap between the objectives of DCI's construction and shared-instrumentation programs. The construction program supports costly and large-scale projects that create new buildings and establish new research facilities, used for research purposes for decades. Such programs require special Congressional appropriation. The shared instrumentation program funds acquisitions of advanced scientific instruments to research institutions nationwide. In contrast, any advanced equipment described in this concept will not directly produce scientific data, but is much needed to improve and accelerate the operations of research facilities, and will contribute to the overall quality of scientific research.

ORIP requests approval of this concept to create a program to support the modernization of physical infrastructure in animal research facilities and biomedical laboratories.