ORIP

OFFICE OF RESEARCH
INFRASTRUCTURE PROGRAMS

INFRASTRUCTURE AND RESOURCES FOR INNOVATION

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FACT SHEET

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ORIP'S MISSION

ORIP advances the NIH mission by supporting infrastructure for innovation. This support is focused on research resources, including animal models for human diseases, cutting-edge scientific instrumentation, construction and modernization of research facilities, and research training opportunities for veterinary scientists. Through continued engagement with NIH institutes, centers, and offices and the biomedical research community, ORIP empowers and expands existing programs and develops new initiatives to support NIH research at the forefront of scientific progress.

NIH National Institutes of Health
Office of Research Infrastructure Programs

OVERVIEW

ORIP supports the scientific advancement of biomedical research by supporting key infrastructure through the creation of animal models for human disease, access to state-of-the-art instrumentation and facilities, support of educational training programs, and assistance to small businesses in developing new technologies.

ORIP's two divisions, the Division of Comparative Medicine and the Division of Construction and Instruments, play essential roles in supporting and accelerating biomedical discovery. Brief descriptions of each division are below. For details about ORIP's priority areas, refer to ORIP's Strategic Plan 2021–2025, "Infrastructure for Innovation."

The **Division of Comparative Medicine (DCM)** functions to support infrastructure for innovative research by developing animal models and related biological resources; managing the infrastructure required to maintain, distribute, and utilize these models and resources; and providing training for scientists. DCM is committed to ensuring that NIH-supported scientists have access to, and facilities for, important animal models for disease.

The **Division of Construction and Instruments (DCI)** enhances our nation's competitiveness in biomedical research by supporting physical infrastructure programs to (1) provide the research community with shared and cost-efficient access to advanced scientific instruments that generate data for scientific discoveries, (2) provide supporting equipment that innovates scientific research operations, and (3) modernize research facilities that drive transformative biomedical research for 21st century results.

The nuclear magnetic resonance (NMR) laboratory at the National Center for Natural Products Research (NCNPR) at The University of Mississippi School of Pharmacy. The laboratory's construction was partially funded by an ORIP construction grant. Here, natural products chemists use NMR to determine the molecular identity and structure of promising compounds from medicinal plants. Image courtesy of the NCNPR.

MOVING TRANSLATIONAL RESEARCH FORWARD USING ANIMAL MODELS FOR HUMAN DISEASES

Human Disease Model Resource and Research Centers

ORIP understands that developing novel therapeutic targets and vaccines for human diseases requires the use of extensively phenotyped animal models that mimic the clinical symptoms and complexity of human biology. DCM supports a variety of research projects and resources to develop animal models that include, but are not limited to, rodents, nonhuman primates, invertebrates, and aquatic models. Through DCM, ORIP has developed strategies to expand access to animal models through resources, such as the Mutant Mouse Resource and Research Centers, National Primate Research Centers, National Swine Resource and Research Center, Zebrafish International Research Center, and Bloomington *Drosophila* Stock Center. ORIP is exploring ways to improve the reproducibility and rigor of research through DCM by training investigators and through DCI by supporting the modernization and improvement of animal research facilities through the Animal Facility Improvement Program.

Free-ranging rhesus macaques at the Caribbean Primate Research Center (CPRC) on the island of Cayo Santiago in Puerto Rico. The CPRC supports a broad range of studies, from microbiome variation to the evolution of natural pedagogy to social group dynamics and more. ORIP supports the CPRC with an animal and biological material resources grant and a construction grant for the renovation of facilities after Hurricane Maria. Photo obtained from the Cayo Santiago Biological Field Station's Facebook page.

*Zebrafish (*Danio rerio*). Zebrafish is an important biomedical model thanks to its sequenced genome, easy genetic manipulation, high fecundity, external fertilization and rapid development, and transparent embryo. It is a unique model animal used for studies of biological processes and human diseases.*

A transmission electron microscope (TEM). TEMs generate very high-resolution images from thin biological specimens and routinely can magnify objects up to 2 million times. ORIP's S10 program has funded many TEMs, as well as other types of microscopes, since its inception in 1982.

Training and Career Development of Veterinary Scientists

As part of ORIP, DCM seeks to diversify the biomedical workforce by offering individual and institutional training grants for veterinary scientists, biomedical scientists with a veterinary degree, and predoctoral veterinary students to expand their knowledge in the use, characterization, and care of animal models. The objective of this training effort is to foster an environment of collaboration and to attract highly qualified veterinary scientists to the biomedical arena.

To learn more about these programs, visit the ORIP Training and Career Development webpages.

State-of-the-Art Instrumentation Is Accelerating Biomedical Research

The emergence and increasing diversity of novel technologies in biomedical sciences requires access to state-of-the-art research instrumentation. ORIP's DCI strategy to support research infrastructure comprises both construction and modernization of research laboratories and animal facilities, as well as the purchase of advanced instruments and support services equipment. For the last four decades, ORIP's S10 program has supported the acquisition of innovative instrumentation to enhance NIH-funded research. Instruments funded by this program have enabled research conducted at hundreds of laboratories supported by NIH Institutes and Centers. Two categories of the S10 program, the Shared Instrumentation Grant Program and the High-End Instrumentation Program, support purchases of commercially available instruments that may be cost-prohibitive to many researchers. Two new grant programs offer opportunities to institutions with historically lower levels of NIH funding.

The Basic Instrumentation Grant Program provides scientific instruments, and the Modern Equipment for Shared-use Biomedical Research Facilities advances scientific operations with innovative support equipment. These physical infrastructure programs enhance the nation's biomedical research competitiveness.

To learn more about these programs, visit the ORIP DCI webpages.

Supporting Private Sector Efforts to Improve Health

Another strategic area of ORIP is funding opportunities for small businesses. ORIP seeks to increase small business participation in NIH-supported research and development, as well as to promote commercialization of private sector–based technology that is established with federal funding. The Small Business Innovation Research (SBIR) program and Small Business Technology Transfer (STTR) program are funding initiatives designed to support businesses whose efforts are geared toward improving health. ORIP is interested in funding research to develop biomedical methods and technologies that relate to improvements in animal models for human disease research and the care, use, and management of laboratory animals. ORIP encourages applications from investigators to bring new animal care technologies to support the biomedical field.

To learn more about these programs, visit the ORIP SBIR/STTR webpages.

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