Concept Clearance – Reissue of Resource-Related Research Projects for
Development of Animal Models and Related Materials (R24)

A major theme of the ORIP Strategic Plan 2021-2025 is to facilitate the development and ensure the availability of the highest quality and most useful animal models and related resources for the advancement of research on human disease. As part of ORIP's NIH-wide emphasis, ORIP seeks to improve and disseminate the best animal models that are of interest to multiple NIH Institutes and Centers (ICs). Thus, ORIP has developed an Animal Models R24 Program to: 1) encourage resource-related research to develop, characterize or improve animal models of human diseases; 2) develop or improve technologies and methods that aim to enhance rigor and reproducibility of research with animal models; 3) improve access to information about or generated from the use of animal models of human disease; or 4) improve diagnosis and control of diseases in laboratory animals. This R24 Program was established by the former National Center for Research Resources in 2010 and has continued to evolve under ORIP's administration since 2012. Proposed R24 projects must have broad application to multiple NIH ICs and explore multiple organ systems or evaluate diseases that impact multiple organ systems. To align with ORIP's mission on awarding grants to support research resources, such as animal models of human disease, this R24 program meets the demand for animal models that are more predictable and accessible for biomedical research and addresses the need for a broad array of animal models that mimic the various pathogenic events leading to different diseases. Under the current active FOA, RFA-OD-19-027, 19 of 81 applications have been funded (23% award rate). Applications continue to be accepted and awards made under RFA-OD-19-027.

The R24 grant mechanism is used in a wide variety of ways to provide resources to research projects or to enhance research infrastructure. ORIP's Animal Models Program utilizing the R24 grant mechanism has made significant progress and impact in biomedical research. Seventy-four awards made under the three most recently issued FOAs (2013 to present) resulted in 915 publications, with ~83% of awards having at least one publication since 2014. These publications have been cited 23,067 times as of July 2022. Among the 74 awards, most were animal- or molecular/cellular biology-oriented research, with 32% focusing on model development, 25% on technology development or information generation, and 14% on colony management. Most of these awards supported widely used animal models, including rodents (31% of awards) such as mice and rats, aquatics (30% of awards) such as zebrafish and frogs, invertebrates such as fruit flies and nematodes (20% of awards), and nonhuman primates (15% of awards).

The R24 Program has led to the development of new animal and related material resources, such as transgenic animals and molecular reagents; a vast amount of detailed information related to animal models, including atlases and validated information on animal stocks; and new and improved technologies, including imaging, genetic engineering, and cryopreservation technologies. These resources and information are widely shared, used and accessed by the research community and have significantly impacted biomedical research. Examples of R24 awards are noted below:

- "A Comprehensive Human cDNA Library For Functional Gene Replacement in *Drosophila*" awarded to Baylor College of Medicine led to the development of more than 6,000 transgenic flies publicly available through the Bloomington *Drosophila* Stock Center (also supported by ORIP) and 42 publications (cited 1,048 times);
- "CRE Driver Strain Resources" awarded to the Jackson Laboratory validated Cre driver mouse strains, posted strain information online that has over 50,000 page views annually, and produced 15 publications (cited 419 times);
- "Resource for Nonhuman Primate Immune Reagents" awarded to the University of Louisiana at Lafayette, which develops and distributes customized nonhuman primate reagents that are not commercially available, including cytokines, PET probes, and monoclonal antibodies and produced 24 publications (cited 946 times).

Based on the recent successes of the Animal Models R24 Program and the continuing demand for high quality, useful, and accessible animal models and related materials for biomedical research, ORIP requests concept clearance from the Council of Councils to continue support for the "Resource-Related Research Projects for Development of Animal Models and Related Materials (R24)."