

Research Development Fund – Fall 2023 Application Template

Submission Deadline: **12:00PM CDT Monday – October 23, 2023**, to rdf@tamu.edu

****Applications exceeding page limits for any section or do not follow the template will not be reviewed****

Application Title: The acquisition of an IVIS® Spectrum CT2 imaging system in Texas A&M Preclinical Phenotyping Core

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Key Participating Units: Texas A&M Preclinical Phenotyping Core (TPPC)

RDF Amount Requested (\$): 825,387.65

Executive Summary

This application addresses the need for an **IVIS® Spectrum CT2 imaging system** from Revvity (previously named PerkinElmer) at Texas A&M Preclinical Phenotyping Core (TPPC). The IVIS® Spectrum CT2 imaging system is the most advanced *in vivo* imaging system available on the market. Not only can it quantitate and localize 3D fluorescent and bioluminescent sources *in vivo* but also uses a low dose of micro-CT (Computed Tomography), bringing anatomical context to each small animal's functional studies, making it a perfect fit for the needs of the TPPC where specific treatments must be evaluated in several different animal models. Adopting near-infrared (NIR) wavelengths and spectral unmixing algorithms allows autofluorescence removal and/or easy separation and quantification of multiplexed fluorescent signals for therapeutics, tumors or infectious agents.

This non-invasive longitudinal monitoring system offers the best way to measure disease progression, cell trafficking, drug safety and toxicology, treatment efficacy, and biological processes with high resolution (20 mm) and fast imaging capability, which can be applied to oncology, infectious diseases, musculoskeletal, cardiovascular, neuroinflammation to respiratory research areas. Moreover, its ease of use, low maintenance, and presence in an all-in-one unit with a protective shell will allow each investigator to access this system easily after the training. The IVIS® Spectrum CT2 imaging system is currently unavailable in the TAMU research community. The TPPC is the newest core within the Texas A&M Institute for Genome Sciences and Society (TIGSS), established in 2019, supporting metabolic, skeletomuscular, cardiovascular, behavioral, cancer, infection, therapeutic, and molecular assays for detailed preclinical analysis and phenotyping. Thirty-six (36) TAMU faculties from 12 departments utilized the core service in 2023 for diverse research projects. The instrument will be housed in the current TPPC space at the main LARR, with other imaging capacities such as the Vevo 3100 Ultrasound and Storz endoscope system. Many campus faculties from 7 colleges and 11 departments have expressed interest and want to be listed as users of IVIS® Spectrum CT2. The requested IVIS® Spectrum CT2 imaging system will allow for expanded approaches on research projects currently supported by NIH, NSF, USDA, DoD, and many foundations in the areas of **Cancer Biology, Therapeutics discovery, Diabetics and metabolism, Mammary biology, Endometriosis, Biomedical engineering, Neurological disorders, Infection/inflammation, and Ecology/Conservation Biology research.** It will also provide substantial and fundamental infrastructural support to open new research opportunities to advance the TAMU research frontiers. Adding an IVIS® Spectrum CT2 will make the broad TAMU research community far more competitive for substantial new funding. However, this addition is costly and cannot be purchased with the yearly budget allocated to the TPPC.