

Research Development Fund – FALL FY17 Cover Page

Application Title: Rodent In Vivo Imaging and Behavioral Core Facility

Lead contact for RDF Application:

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Key Participating Units: College of Medicine (Neuroscience and Experimental Therapeutics)
College of Liberal Arts (Psychology)
College of Veterinary Medicine (VIBS)

Participating Faculty: Dustin DuBois/David Earnest/Michelle Hook/Rajesh Miranda/Samba Reddy/Jun Wang/Ursula Winzer-Serhan/Jim Grau/Rachel Smith/Jane Welsh/Gladys Ko/Jianrong Li

Anticipated Request Amount (\$): 1.5 million

Executive summary:

Overall Scope and Objective: The objective of this application is to establish a Rodent In Vivo Imaging and Behavioral core facility on The Texas A&M University Health Science Center (HSC) campus in Bryan. The funding will bring recent developments in live, small animal imaging, including brain and neural imaging, to an established repertoire of rodent behavioral assessment at the university. We aim to avail TAMU mouse and rat researchers of innovations miniaturizing both non-invasive (MRI) and invasive (microendoscopic, fiberoptic) equipment, allowing repeated measurements across the body and even deep within the brain of a live, behaving rodent over time. While traditional imaging approaches exist at TAMU, they do not allow monitoring in freely-moving animals.

Infrastructure Enhancement: We envision this funding as the first step in the creation of a cutting-edge, rodent imaging and behavior core, contributing significantly to translational research at the university. Using the funds obtained, equipment will be added to existing behavioral testing spaces in the Medical Research & Education Building (MREB), including inside the HSC vivarium. With the completion of the next building on the Bryan campus, the HSC vivarium will be expanded, and we anticipate centralizing and further building the core. Since the purpose of live imaging is to understand sensitive observations using equipment maintained at our facility, it is crucial for the researchers involved that it be located in the MREB. Involved faculty outside the facility will arrange to have animals reared and tested onsite, and we anticipate a minor fee structure to support facility equipment and staffing.

Benefits to TAMUS: Across the campus, many TAMU researchers seek to understand physiology using rodent models, often in the context of disease, and do so by studying behavior. In vivo imaging techniques are crucial to remaining at the cutting edge of health- and neuroscience-related fields and are increasingly expected (and rewarded) in federal funding applications, as evidenced by the recent BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Initiative. The development of such a facility, bringing these capabilities to TAMU researchers, will help to maintain and improve our reputation as a serious research institution and will keep our funding proposals highly competitive. Training in such valued techniques will ensure that our students and postdocs are sought after as they continue their training and education and enter careers. Finally, live imaging significantly increases the relevance of our observations and reduces the number of animals required, also reducing cost.

Summary: In vivo imaging techniques are at the forefront of many fields of study, including those related to health, physiology and neuroscience. Keeping the TAMU rodent research facilities, which serve a number of our primary investigators, at the leading edge of capability will help to ensure our presence as a significant research institute and increase the competitiveness of our faculty and students.