

The Global Health Research Complex (GHRC): Interdisciplinary Core for the Study of High Consequence and Vector Borne Diseases

Lead contact: Allison R. Ficht, Department: Molecular and Cellular Medicine, Director, Global Health Research Complex,
Email address: a-ficht@tamu.edu, Phone: (979) 845-2728

Key Participating units: Texas A&M Health Science Center College of Medicine, Texas A&M AgriLife Research, Texas A&M College of Veterinary Medicine and Biomedical Sciences, Texas A&M College of Agriculture and Life Sciences Department of Entomology, Institute for Infectious animal Diseases, Texas A&M College of Engineering

Key Team members or Co-PIs: Drs. Garry Adams, Angela Arenas, Thomas Ficht, Noah Cohen, Drew Hillhouse, Morgan Scott, Albert Mulenga, Sanjay Reddy, Scott Dindot - College of Veterinary Medicine and Biomedical Sciences, Dr. Dee Ellis, Institute for Infectious Animal Diseases, Drs. Helene Andrews-Polymenis, Paul deFigueiredo - College of Medicine, Dr. David Threadgill - AgriLife Research and College of Medicine, Dr. Arul Jayaraman - College of Engineering, Dr. Andy Herring - College of Agriculture and Life Sciences, Drs. Gabe Hamer, Kevin Myles, Zach Edelman - Texas A&M AgriLife Research

Total amount requested: \$1,615,120.82

The request presented will provide unique state-of-the-art equipment for a multidisciplinary, high containment core laboratory, The Global Health Research Complex, scheduled for completion in July 2019. While basic equipment was included in the construction budget (e.g. freezers, CO₂ incubators, biosafety cabinets), equipment for cell analysis, genomics and sample analysis within the BSL3 laboratories was not. We are requesting funds for analysis of live cells that cannot be transferred or conducted outside of containment for the samples generated in the large animal BSL3 facility. To broaden the user base, BSL2 samples can also be analyzed by facility technical staff in the BSL3 labs and raw data transmitted electronically for faculty/client analysis.

The GHRC is a 102,000sq. ft. core facility designed for large animal and insect vector research that will serve the research needs of faculty at Texas A&M University, attracting collaborators from other academic institutions and industry. The GHRC will enable research on high impact infectious agents and diseases of critical importance to plant, animal and human health. It is designed to address emerging infectious diseases, antibiotic resistant organisms that occur naturally, and deliberate release of modified organisms. Research in a biocontainment facility is needed to understand the mechanisms of action relevant to these zoonotic pathogens; to develop new and innovative methods for monitoring, detecting and preventing the resulting disease; and for treatment and containment during major outbreaks. The facility at the time of completion will be one of only two in the country that supports both insect vector and large animal BSL3Ag research and promises to provide extensive funding opportunities for TAMU faculty and students as well as national and international researchers.

Since funding and programming of the building five years ago major technological leaps in instrumentation have been made. Technology for interrogation of infectious disease transmission, the genetic basis of susceptibility to disease, the basis of transmission through insects and plants and the basis of resistance to therapeutics especially high throughput methodology have moved ahead exponentially. In order to provide faculty with state-of-the-art technology to address scientific problems in these areas and make them competitive for funding, we are requesting funds for instrumentation to reach this new level.

The specific request includes 1) self-contained flow cytometers for cell sorting and analysis of live cells, 2) equipment to analyze cell by cell genomic data within these samples, 3) a multi-mode plate reader to perform cell migration and invasion assays and live cell imaging 4) a telemetry network to monitor the physiological and behavioral metrics of animals corresponding to acquisition of the samples. Requested equipment provides direct analysis of cells and bypasses the need for species specific reagents that are often unavailable for exotic species.

This request represents a strategic investment in Texas A&M that will broaden our research base and funding, increase our national prominence in medical, veterinary medical and agricultural research and establish Texas A&M as a leader in emerging infectious disease

Scope of the request:

Breadth of impact on TAMU infrastructure: