

CIMR - A CORE FOR INTEGRATED MICROBIOTA RESEARCH (<https://www.medicine.tamhsc.edu/cimr/>)

Lead contact:

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Key Participating units:

Texas A&M Health Science Center (TAMHSC); College of Veterinary Medicine (CVM) / Comparative Medicine Program (CMP); College of Engineering (COE); AgriLife; College of Science; USDA

Key Team members or co-investigators:

PI - Dr. Robert C. Alaniz Director, Cell Analysis Facility, COM-TAMHSC.

Co-PI - Dr. David Threadgill Director, Institute for Genome Sciences & Society (IGSS), TAMU.

Co-PI - Dr. James Elliott Director, Comparative Medicine Program, CVM-TAMU.

Co-PI - Dr. Jan Suchodolski Assoc. Director, GI Lab - Small Animal Hospital, CVM-TAMU.

Co-PI - Dr. Arul Jayaraman Director, Integrated Metabolomics Analysis Core (IMAC), TEES-TAMU.

Co-PI - Dr. Benjamin Murgu Director, Texas Institute for Genomic Medicine (TIGM), AgriLife-TAMU.

Total amount requested: ~\$1,000,000 (\$750,000 equipment/instrumentation; \$250,000 personnel/ancillary)

Executive summary:

The plan for this RDF proposal is to expand the **Core for Integrated Microbiota Research (CIMR)** - a cutting-edge and *new-to-campus* research facility that enables new investigator research on the microbiota - an area with undeniable impact and growth in the natural, biomedical, agricultural, genomic, and clinical sciences. The CIMR centers on study of the **microbiota** - *the community of beneficial microbes that symbiotically inhabit host or environmental ecosystems*. **The importance of the microbiota as a critical factor in ecosystem and host health is now indisputable**, and the last 8 years has witnessed exponential growth in microbiota research, funding, and publications. Even with that, *microbiota research will continue to grow in a wide-range of disciplines in the coming decades*. The importance for increased microbiota research has been noted by the National Academy of Sciences, National Institutes of Health, and World Economic Forum, and further evidenced by the White House creation of the National Microbiome Initiative (NMI) in early 2016 to support enhanced microbiota research, develop interdisciplinary platform technologies, and expand the microbiome workforce. From the President's NMI, federal agencies are dedicating over the coming 3 years an extra \$121 million for microbiota research, with notable peer academic institutions, non-profits and private businesses pledging an additional \$400 million to the NMI; this all on top of the previous ~\$1 billion federal investment that is reported to be matched over the next decade(s). **For these reasons, "microbiota research" is predicted by to make a larger impact on the future of science and medicine than did genomics decades ago.**

Data from our 2014 campus-wide survey indicated >50 highly productive and well-funded investigators from 5 colleges require a centralized "microbiota core" to remain competitive for funding. However, at the moment, it is impossible for TAMU investigators to perform comprehensive microbiota research because the very specialized research instrumentation/equipment to do this does not exist at TAMU. In response to this need at TAMU, the CIMR was created as a small, start-up initiative funded by HSC, COM and CVM, providing a self-contained, operational germ-free mouse core and a microbiology lab that conducts basic microbiota microbiological studies however, at current size CIMR can only accommodate 3-4 investigator-experiments/year. **This proposal describes the expansion of the CIMR** to include (1) renovations that provide a larger germ-free mouse facility that accommodates ~25 experiments/year, (2) additional laboratory capabilities including functional microbiota studies, microbial storage, handling, and culture (3) and with research management structure and system to link the experimental services to other scientific resources on campus, namely genomic (TIGSS) and metabolomic (RDF-funded IMAC) analyses. Thus with the requested RDF support, the CIMR will immediately augment campus-wide research and single and multi-investigator grants success, thus providing a robust return-on-investment. In addition, *the CIMR will propel TAMU research in this new, innovative, and burgeoning field for decades to come, thus creating regional and national prominence for TAMU.*