

## IMAC: AN INTEGRATED METABOLOMICS ANALYSIS CORE

### Lead contact:

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### Key Participating units:

College of Engineering/Texas Engineering Experiment Station  
AgriLife  
College of Veterinary Medicine  
Texas A&M Health Science Center  
College of Science  
Institute of Biosciences & Technology, Houston

### Key Team members:

Dr. Lawrence Dangott, Director, Protein Chemistry Laboratory  
Dr. Stephen Safe, College of Veterinary Medicine  
Dr. Robert Chapkin, AgriLife  
Dr. Robert Alaniz, Texas A&M Health Science Center

Total amount requested: \$1,553,611

### Executive summary:

We propose to establish a state-of-the-art metabolomics core facility at TAMU. The **Integrated Metabolomics Analysis Core (IMAC)** addresses a significant need for these capabilities in TAMU and will significantly impact the research enterprise by increasing the competitiveness of individual investigator grants, strengthening the capabilities of current and planned large center grant initiatives, providing support to clinical labs, and enhancing student training and education. In addition, the facility will synergize with and further the development of related fields such as systems biology that rely on high quality omics data. The IMAC facility will provide TAMU PIs workflows for identification, characterization, and quantitation of small molecules. Users will be able to discover metabolites with high resolution and accurate mass and structurally characterize them using a Q Exactive Plus mass spectrometer. A TSQ Quantiva mass spectrometer and a TSQ 8000EVO gas chromatography mass spectrometer will also be available for quantitative studies. The IMAC facility will also feature a strong systems biology and analysis component for pre-experiment design (pathway analysis and computational prediction of target metabolites produced by host and the microbiota) and post-experiment integration of metabolite data with other -omics data sets (e.g., with metagenomic data).

The IMAC facility is built on a strong user base from six colleges within TAMU and the Institute of Biosciences & Technology, Houston. These PIs have a proven federal funding record and currently have projects that require metabolomics capabilities. The IMAC will also feature educational and outreach activities for promoting collaboration among users and training students and scientists. The IMAC facility will be administratively placed in the Protein Chemistry Laboratory (PCL) and located in the Biochemistry & Biophysics building. We have secured commitment from the Deans of participating agencies and colleges to cost-share staff support (1 PhD and 1 MS scientist) for 3 years, which will further enhance as well as sustain the IMAC beyond the initial funding period. The strategic emphasis on metabolomics will be a significant resource for TAMU researchers and have a significant impact on several areas, including medicine, agriculture, and engineering.