

Texas A&M Mouse Metabolic Phenotyping

The Texas A&M Mouse Metabolic Phenotyping will primarily focus on an whole body and organ systems approach to phenotyping the metabolic response and function. We will offer a unique experimental model that enables quantification of whole body as well as individual organ and tissue metabolism. Our services will be aimed at delivering sophisticated and quantitative data of great physiological relevance for many diseases in easily understood terminology in a reasonable amount of time.

We are measure phenotypes like 1) changes in glucose, lipid and protein metabolism 2) insulin resistance 3) body composition 4) nutrient absorption 5) hormones 6) cytokines and adipokines 7) reactive oxygen species and glutathione metabolism 8) insulin and other signaling pathway components 9) organ function. In addition, we provide assays to measure changes in multiple-end-organ systems such as defects in cardiovascular, kidney, nervous system, muscle, and skin (wound healing).

We will provide sophisticated metabolic phenotyping data that enables unambiguous interpretation by researchers who are not necessarily conversant in isotope tracer methodology. The combined use of tracer methodology and the A-V balance technique is consistent with this goal. Measuring whole body metabolism requires arterial catheterization and additional organ measurements like the net balance of a substrate across an organ or tissue such as muscle requires also catheterization of the vein draining the organ or tissue. The blood flow rate will be measured, and the arterial and venous concentrations and isotopic enrichments of the substrate of interest determined with precision and accuracy in our facilities. We have the skills to perform the microsurgery, required to place and secure catheters. Mass spectrometry techniques and other analysis facilities required for the analyses on the small sample sizes are available.

TIGM will provide an optimal environment for accurate and reproducible phenotyping by providing adequate housing, animal husbandry, veterinary care and effective quarantine facilities to be able to perform the phenotyping "behind the barrier". The unique aspect of our setup is that experiments will be done within the quarantine facility, thereby greatly decreasing the lag time between submission of animals and completion of the experiments.

Potential Users

On the TAMU campus, there are several researchers that have unmet need to be able to metabolically phenotype the different transgenic mouse strains and the response to interventions.

The unique capabilities of mouse phenotyping partially is provided by the NIH MMPC consortium (www.mmpc.org). However, there are no MMPC centers in Texas, a state with many research centers that use transgenic mouse strains and are in need of our specialized metabolic phenotyping capabilities. In addition, the available clones to create specific transgenic strains are available at TIGM and metabolic phenotyping now can take place immediately on the generated mouse strains. This is a major advantage over the procedures that the MMPC centers have instigated.