Key questions defining research program:
1) How do changes in liver mitochondrial metabolism contribute hepatic glucose production?
2) How does obesity-associated fatty liver inhibit mitochondrial quality control via mitophagy?
3) How does the GI tract contribute to energy balance and maintenance of body weight?
4) Is targeting cellular energetic efficiency a viable approach to treat obesity?
5) Is insulin action and glucose homeostasis best assessed by isotopic infusion under steady-state or non-steady-state conditions?

Key words describing research program:
1) Obesity
2) Non-alcoholic fatty liver disease (NAFLD)
3) Mitochondrial metabolism
4) Physiology of insulin action, glucose homeostasis and type 2 diabetes
5) In vivo assessment of metabolism using stable and radioactive isotopes

Titles for shovel-ready research projects:
1) Liver-specific inhibition of PARKIN-mediated mitophagy is associated with mitochondrial dysfunction and increased rates of hepatic glucose production.
2) Changes in gastrointestinal motility due to loss of enteric nervous system signaling contribute to protection from diet-induced obesity in Park2 KO mice.
3) Treating obesity by inhibiting ATP synthesis and promoting ATP hydrolysis via ATPIF1 deletion.
4) Assessment of postprandial glucose metabolism – appearance of ingested glucose, rates of hepatic glucose production and peripheral glucose disposal - using isotope approaches.

Data sources for shovel-ready research projects:
1) Banked tissue (frozen and fixed) available for immediate analysis. Active animal colony ready for in vivo and ex vivo studies (IACUC approval secured, colony maintained by staff).
2) Banked tissue (frozen and fixed) available for immediate analysis. Active animal colony ready for in vivo studies (IACUC approval secured, colony maintained by staff).
3) Banked tissue (frozen and fixed) available for immediate analysis. Active animal colony ready for in vivo studies (IACUC approval secured, colony maintained by staff).
4) IACUC approval secured for these studies. Mice are purchased commercially and data would be generated and analyzed during the course of the LEAD program. Emphasis for this project would be learning surgical techniques in mice and performing live infusions and analysis of isotopic enrichments and glucose turnover by modeling.