Key questions defining research program:

- How do changes in liver mitochondrial metabolism contribute to increased rates of hepatic glucose production?
- How does obesity-associated fatty liver inhibit mitochondrial quality control via mitophagy?
- How does the gastrointestinal tract contribute to energy balance and maintenance of body weight?
- Is targeting cellular energetic efficiency a viable approach to treat obesity?
- How do SGLT2 inhibitors reduce the risk of death due to cardiovascular disease in patients with type 2 diabetes?

Key words describing research program:

- Obesity, type 2 diabetes and non-alcoholic fatty liver disease (NAFLD)
- Mitochondrial metabolism
- Physiology of insulin action, glucose homeostasis and type 2 diabetes
- Cardio-protective effects of SGLT2 inhibitors
- In vivo assessment of metabolism using stable and radioactive isotopes

Titles for shovel-ready research projects:

- Liver-specific inhibition of PARKIN-mediated mitophagy is associated with mitochondrial dysfunction and increased rates of hepatic glucose production
- Changes in gastrointestinal motility due to loss of enteric nervous system signaling contribute to protection from diet-induced obesity in Park2 KO mice
- Treating obesity by inhibiting ATP synthesis and promoting ATP hydrolysis via ATPIF1 deletion
- SGLT2 inhibitors reduce death from cardiovascular disease by restoring cardiac metabolic flexibility
- Assessment of postprandial glucose metabolism – appearance of ingested glucose, rates of hepatic glucose production and peripheral glucose disposal - using a dual-isotope approach in mice

Data sources for shovel-ready research projects:

- Banked tissue (frozen and fixed) available for immediate analysis.
- Existing data set in need of further analysis; banked tissue (frozen) available for immediate analysis
- Active animal colony ready for in vivo and ex vivo studies