Post-doctoral Position
Genetics and Pathophysiology of Type 2 Diabetes
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Genetic Pipeline
We screened a population of mice that were derived by outbreeding 8 inbred strains for >20 generations for phenotypes related to diabetes. These include insulin secretion from pancreatic islets ex vivo, food intake, microbiome composition, serum and liver metabolites, and proteomics and transcriptomics of their islets. From these studies, we have mapped hundreds of quantitative trait loci (QTL) and identified genes controlling these phenotypes.

Specific genes.
- We have generated knockout mice and for a protein kinase and a protein tyrosine phosphatase that we found through our gene mapping. Discovery of the substrates for these enzymes will reveal the pathways by which they regulate insulin secretion.
- We have generated a knockout mouse for a transcription factor we genetically mapped. Discovery of the direct targets of the transcription factor will uncover a pathway leading to the regulation of insulin secretion.

Novel gene discovery
- We are mapping novel genes for the following phenotypes:
  - Hepatic steatosis (fatty liver)
  - Liver glycogen and its relation to metabolic disease
  - Obesity and food intake
  - The intestinal microbiome; host genes that determine microbiome composition

Training Opportunities
- Mouse genetics
- Metabolic biochemistry
- Mass spectrometry
- Statistics and bioinformatics
- Cell biology of protein trafficking and signaling pathways
- Microbiome genetics, physiology, and microbiology

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