Abstract of Presentation

Presentation Title:

Studying the role of microRNAs in the regulation of gene expression in normal physiology and disease

Abstract :

Integration of extracellular hormonal and nutrient signals into comprehensive gene expression patterns leads to tightly choreographed phenotypic responses that regulate metabolism and differentiation. The overall research interest of the laboratory is to determine the fundamental genetic/biochemical mechanisms that regulate glucose and lipid metabolism through the study of transcriptional and translational regulators that control energy homeostasis. The importance of genetic regulation in the maintenance of glucose homeostasis is underscored by the many examples of aberrant signal transduction and transcriptional activation resulting in type 2 diabetes and the development of secondary complications.

MicroRNAs (miRNAs) are a recently discovered class of noncoding RNAs that exist as short inverted repeats in the genomes of invertebrates and vertebrates. It is believed that miRNAs are regulators of target mRNA translation and stability, however, most target mRNAs remain to be identified. We have identified novel miRNAs by tissue-specific cloning from pancreatic b-cells. Expression of these 21-nucleodide RNAs was only detected in pancreatic islets, suggesting a critical role in endocrine pancreas specification, cell lineage decisions and function. We have initiated a series of molecular genetic, biochemical and bioinformatic studies to elucidate the function of microRNAs that are enriched in the liver, muscle and pancreatic islets and dysexpressed in ype 2 diabetes.