Jing Hughes, MD, PhD
Washington University School of Medicine in St. Louis
Associate Professor of Medicine, Division of Endocrinology, Metabolism & Lipid Research

Talk Title: **Primary cilia in pancreatic islet function**

Abstract:
Primary cilia are specialized cell-surface organelles that mediate sensory perception and, in contrast to motile cilia and flagella, thought to lack motility function. My lab and others have shown that pancreatic islet cells express primary cilia which are rich with sensory function and are crucial for regulating glucose homeostasis. Recently, we have demonstrated that primary cilia in pancreatic beta cells exhibit movement and that this motility is required for glucose-dependent insulin secretion. Beta cell cilia contain motor protein complexes conserved from those found in classic motile cilia, and their three-dimensional motion is driven by axonemal dynein and dependent on ATP and glucose metabolism. Inhibition of islet cilia movement blocks beta cell calcium influx and insulin secretion. Correspondingly, changes in cilia motility gene expression are identified in human type 2 diabetes. Our findings redefine primary cilia as dynamic structures possessing both sensory and motile function and raises the possibility that cilia may be a targetable structure for modulating insulin secretion in human diabetes.