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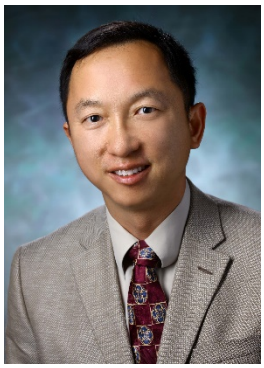

**Research interests**

My research focuses on zinc transporters and translation of basic research findings to early diagnosis and therapeutic interventions of diabetes. Zinc transporting proteins were first discovered in mid-90s in bacteria and then in mammalian cells. I first sought to understand how zinc coordination chemistry is built into protein structures to confer selective binding and energetic movement of zinc ions across the membrane barrier. Over the years, we have used two bacterial zinc transporters YiiP and ZIPB as model proteins for mammalian ZnTs and ZIPs, respectively. We have developed an array of biochemical/biophysical tools to track zinc ions and protein conformational changes at atomic resolution and in millisecond time scale. After we have arrived at a detailed understanding of the structural mechanisms of YiiP and ZIPB, much of our efforts is now dedicated to developing in-cell biochemistry using two human zinc transporters (ZnT8 and ZIP7) as model proteins. Human ZnT8 belongs to a class of important yet intractable membrane proteins. We started from developing a new set of tools and reagents to detect endogenous ZnT8 in human pancreatic beta cells, and track its spatiotemporal responses to pathophysiologic stimuli. The developments of unique ZnT8 reagents and assays enabled the discoveries of a central role of ZnT8 in ER stress under inflammatory insult. These findings provide the experimental basis for further research into in-cell molecular functions of ZnT8 and ZIP7, and their functional integrations into the insulin secretory biology of pancreatic beta cells.