



UC San Diego

Bioengineering

The Kravets Lab – “Pancreatic Islet Physics and Physiology” lab at the Department of Bioengineering and Department of Pediatrics of the University of California San Diego - is looking for a creative and highly motivated Postdoctoral Fellow to lead experimental and computational research projects.

Pancreatic cells heterogeneity results in formation of the functional architecture of the pancreatic islet with small cell subpopulations controlling islet’s response to glucose ([Benninger, Kravets, Nature Reviews Endocrinology, 2022](#)). Until recently, it was assumed that cells in the islet respond to glucose without any order. We have shown that there exists an order to response, and discovered cells leading the 1st phase calcium response: “first responder beta-cells” ([Kravets et.al, PLOS Biology, 2022](#)). The first responders are different from the “hub cells”, previously shown to coordinating islet’s 2nd phase calcium response ([Johnston et al, 2016](#)). The first phase calcium and insulin response is disrupted in diabetes and ageing. Finding a way to protect, induce, and target these cells will lead to subpopulation-specific therapies for diabetes prevention. It is still unknown how stable the beta cell subpopulations are in time, and whether they are pre-determined by genetics, or are transient states.

Additionally, glucagon-secreting alpha cells, somatostatin-secreting delta cells, islet vasculature, and islet innervation release hormones, small molecules, electrical signals, and mechanical stress to control the function of the islet. Our goal is to understand the reasons behind the disproportionate control which β -cell subpopulations (first responder, hub cells) exert over islet function and to discover patterns of functional β -cell network plasticity in health and disease. We seek to discover to which degree paracrine, electrical, and other types of interaction aid in formation of the islet’s subpopulations and functional network.

Successful candidate will have a PhD in Bioengineering, Biology, Physics, Mathematics, Chemistry, Engineering, or related fields. Desired (but not required) skills:

- experience in animal work (mouse or zebrafish) and tissue culture
- willingness to perform animal surgical procedures.
- MATLAB, C (or other languages)
- Signal analysis.

This is a great opportunity to be a part of diverse, multidisciplinary laboratory at the University of California San Diego. We will provide training in the cutting-edge techniques: targeted 2-photon laser ablation, quantitative multi-photon and confocal microscopy, FRAP and FLIM, computational models of islet electrophysiology, optogenetic neuron stimulation *in vivo* in zebrafish, live pancreatic slice platform from diabetic and healthy human donors.

Please contact Dr. Vira Kravets at vkravets@ucsd.edu . Lab website coming soon – check Twitter @KravetsVira for updates.