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TITLE: Pancreas β -cell regeneration in the natural history of type 1 diabetes

FACULTY MENTOR NAME, EMAIL PHONE NUMBER

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RESEARCH PROJECT DESCRIPTION (brief overview of background, hypothesis, methods, role of medical student, funding and relevant publications -- SHOULD NOT EXCEED ~ 250 WORDS)

Type 1 diabetes is an autoimmune disease directed at insulin-producing pancreatic β -cells. We have recently shown that the exocrine portion of the pancreas is also affected in this disease and our studies are related to studies on the neural control of both endocrine and exocrine pancreas. We propose that a sympathetic neuropathy results in reduced β -cell function ultimately resulting in cell loss and clinical disease. This sympathetic neuropathy also affects the exocrine portion leading to subclinical exocrine insufficiency. Our methods include examination of the pancreatic neuro-insular network, β -cell differentiation and loss using 2D and 3D high resolution confocal microscopy and islet mRNA studies using laser capture microdissection and RNA analysis. The student will be involved in suitable experiments according to their interests. Studies are funded by NIH-NIDDK and JDRF.

(1-3)

1. Campbell-Thompson ML, Kaddis JS, Wasserfall C, Haller MJ, Pugliese A, Schatz DA, Shuster JJ, Atkinson MA: The influence of type 1 diabetes on pancreatic weight. *Diabetologia* 2015;
2. Campbell-Thompson M: Organ donor specimens: What can they tell us about type 1 diabetes? *Pediatr Diabetes* 2015;16:320-330
3. Campbell-Thompson ML, Atkinson MA, Butler AE, Chapman NM, Frisk G, Gianani R, Giepmans BN, von Herrath MG, Hyöty H, Kay TW, Korsgren O, Morgan NG, Powers AC, Pugliese A, Richardson SJ, Rowe PA, Tracy S, In't Veld PA: The diagnosis of insulinitis in human type 1 diabetes. *Diabetologia* 2013;56:2541-2543