



## **2024 Pilot Grant**

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### **Project Title: Parsing Dysautonomia in a Dish: Neural Exposure to Exogenous Sjögren's Patient Derived Serum**

The complexity of nervous system interactions and cause-effect of glandular involvement in organ health in Sjögren's patients creates a difficult disease to treat and identify. Dysautonomia and gastrointestinal disorders are correlated with the presence of autoantibodies and interferon and interleukin cascade activation, but the cause is not known. In this proposal, my lab will apply a new in vitro microphysiological system (MPS), or organ-on-a-chip, that combines human autonomic, central, and enteric neurons to systematically examine morphology and excitability in response to Sjögren's derived serum and autoantibody insults. Our MPS will be used for effluent collection, electrophysiology, imaging, and transcriptomics with a systems biology approach to identify the molecular regulators and reveal if there are Sjögren's-based differences in neuron responses to inflammatory cues. Through this proposal, a new MPS will be engineered to controllably study and disrupt the nervous system in the gut-brain axis environment typically inaccessible in vivo.