

# Sympathetic Neuron Development and Neurotrophic Mechanisms

## November 27

Tuesday, 12:30 pm

Weekly Colloquium

Billings Building  
Rosedale Conference Room



**Speaker: Rejji Kuruvilla, Ph.D.**  
Associate Professor  
Director CMDB Graduate Program  
Department of Biology  
Johns Hopkins University

**Host: Jian Zhong, Ph.D.**

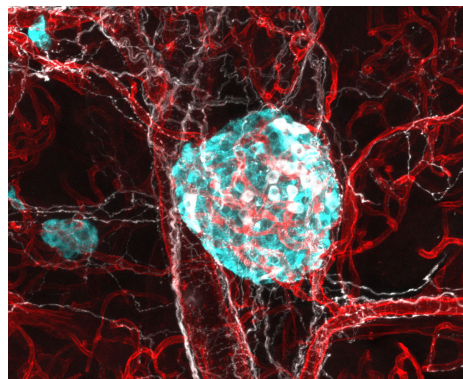
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## Abstract

The sympathetic nervous system, a branch of the autonomic nervous system, is critical for organ homeostasis. Sympathetic axons innervate diverse peripheral organs and tissues to govern fundamental physiological processes including cardiac output, body temperature, regulation of blood glucose levels, and immune functions. A dysfunctional sympathetic nervous system has been associated with several prevalent disorders including congestive heart failure, hypertension, diabetes, immune dysfunction and epithelial cancers. Notably, an emergent concept is that early deficits in the sympathetic nervous system, likely acquired during development, contribute to the etiology of some of these diseases. My laboratory investigates the development and functions of sympathetic neurons using mouse genetics, cell biological approaches, imaging, and physiological analyses.

There are two major research directions in my laboratory that focus on reciprocal interactions between sympathetic neurons and their target organs/tissues: (1) To define how sympathetic neuron connectivity is established and refined by the actions of neurotrophic signals secreted from target tissues, and (2) To elucidate how sympathetic nerves instruct target tissue development and function, focusing in particular, on the islets of Langerhans in the pancreas.



1. Ceasrine AM, Lin EE, Lumelsky DN, Iyer R, and Kuruvilla R. ADRB2 controls glucose homeostasis by developmental regulation of pancreatic islet vasculature. *eLife*, in press.

2. Yamashita N, Joshi R, Zhang S, Zhang ZY, Kuruvilla R. Phospho-regulation of soma-to-axon transcytosis of neurotrophin receptors. *Dev Cell*. 2017 Sep 25;42(6):626-639

3. Chen CM, Orefice LL, Chiu SL, LeGates TA, Hattar S, Haganir RL, Zhao H, Xu B, Kuruvilla R. Wnt5a is essential for hippocampal dendritic maintenance and spatial learning and memory in adult mice. *Proc Natl Acad Sci U S A*. 2017 Jan 24;114(4):E619-E628.



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