

MMI 291 Seminar Series

Current Theme: Interdisciplinary Research
Winter Quarter 2019 – CRN 43601

**Friday Seminar – 12:10-1 PM****“Role of neuronal GPCR signaling in the control of response against bacterial infections and immune homeostasis”**

Dr. Aballay's lab has a broad research program encompassing genetics, functional genomics and neurobiological approaches to study mechanisms involved in the control of immune responses against microbial pathogens. Recent studies from Aballay Lab indicate that different immune and cellular homeostatic mechanisms are regulated at the organismal level by the nervous system. The lab's research has demonstrated that specific neurons suppress innate immunity in the intestinal cells of the nematode *Caenorhabditis elegans*, in part by down-modulating a mitogen-activated protein kinase signaling pathway similar to the mammalian p38 MAPK pathway that is highly conserved across metazoans. The lab found that G-protein coupled receptors (GPCRs) participate in neural circuits that control a conserved p38/PMK-1 MAPK immune pathway and non-canonical and canonical XBP-1 unfolded protein response pathways that are expressed in non-neuronal tissues and that are necessary to alleviate the increased demand on protein folding during immune activation.

Publication references

Microbial Colonization Activates an Immune Fight-and-Flight Response via Neuroendocrine Signaling. Singh J, Aballay A. *Dev Cell*. 2019 Feb 21. pii: S1534-5807(19)30056-5. doi: 10.1016/j.devcel.2019.02.001.

Distinct Roles of Sensory Neurons in Mediating Pathogen Avoidance and Neuropeptide-Dependent Immune Regulation. Cao X, Kajino-Sakamoto R, Doss A, Aballay A. *Cell Rep*. 2017 Nov 7;21(6):1442-1451. doi: 10.1016/j.celrep.2017.10.050.

Neuronal GPCR controls innate immunity by regulating noncanonical unfolded protein response genes. Sun J, Singh V, Kajino-Sakamoto R, Aballay A. *Science*. 2011 May 6;332(6030):729-32. doi: 10.1126/science.1203411. Epub 2011 Apr 7.



April
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**April 12, 2019
12:10 – 1 PM
GBSF 1005**

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