

Plenary Lecture Abstract

Thinking outside the mouse: ex-vivo dissections of enteric neuro-immune-microbiome cross talks.**Nissan Yissachar***The Faculty of Life Sciences, Bar-Ilan University, Israel*

Investigations of host-environment interactions in the gut would greatly benefit from a culture system that preserved cellular architecture yet allowed tight experimental control. We have devised a microfabricated organ culture system that viably preserves the multicellular architecture of the mouse intestine, with luminal flow to control environmental parameters and permit experimental perturbation with microbes, drugs or nutrients. Using this system, we analyzed the early response of intestinal tissue to a panel of commensal bacteria, that triggers the development of either Th17 or T regulatory (Treg) cells in vivo. Remarkably, Th17 and Treg inducers showed diametrically opposite regulation of a neuronal-specific geneset, notably nociceptive neuropeptides. Electrophysiology and calcium imaging showed direct activation of sensory neurons by the Treg-inducing microbes. Thus, differential involvement of the enteric nervous system may partake in bifurcating pro- or anti-inflammatory responses to the gut microbiota.