

Sex Differences in Anatomic Plasticity of Gut Neuronal – Mast Cell Interactions

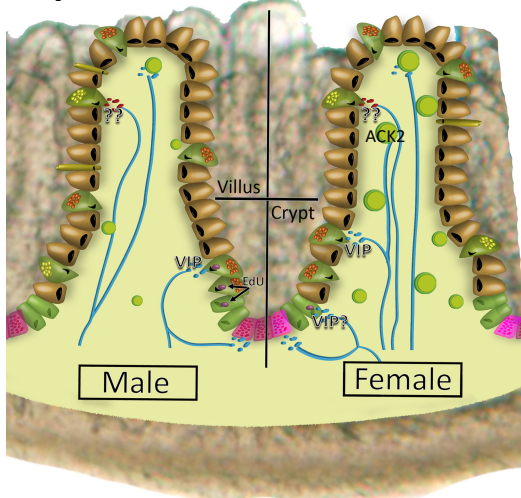
Luke Schwerdtfeger¹ & Stuart Tobet^{1,2}

Department of Biomedical Sciences¹, School of Biomedical Engineering²
 Colorado State University, Fort Collins, CO

Key objective:

- Determine the role of sex as a variable in gut neuronal – mast cell anatomic plasticity and functional signaling.

Graphical Abstract:



Methodology:

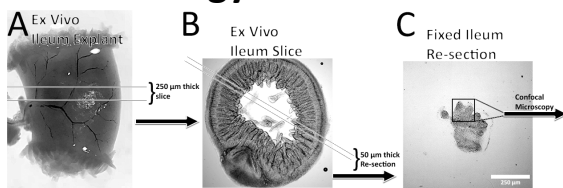


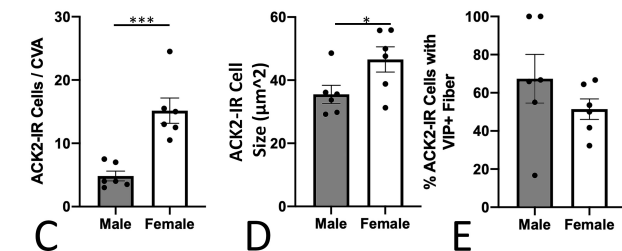
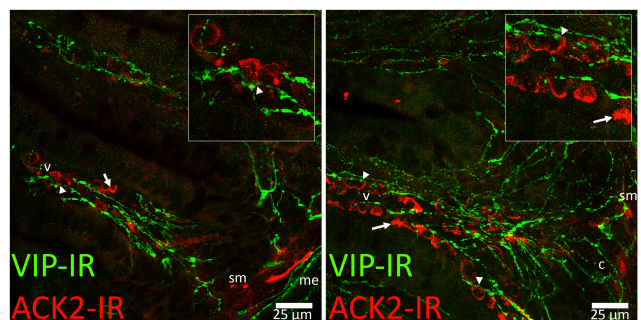
Table 1. Drug treatments used throughout experiments

Treatment	Concentration
Vasoactive Intestinal Peptide (VIP)	10 µM
[D-p-CI-Phe6,Leu17]-VIP (VPACa)	10 µM
Tetrodotoxin (TTX)	10 µM
TLR-grade Lipopolysaccharide (LPS)	10 µg/ml

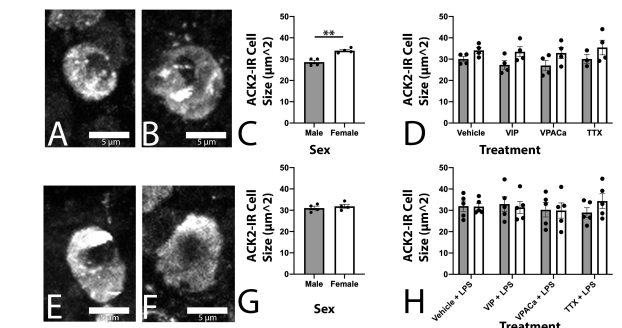
Mouse ileal organotypic slices harnessed for ex vivo pharmacology.

Results:

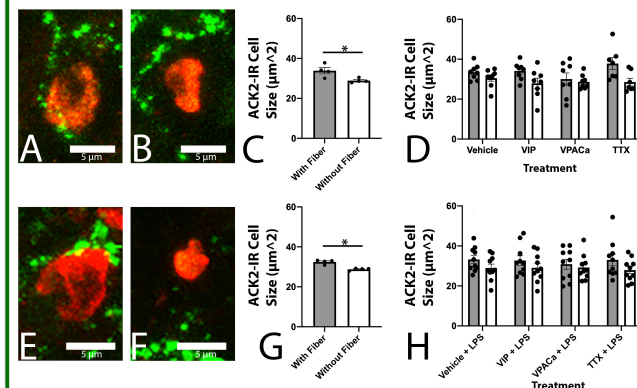
Fixative perfused ileums from females had more anti-c-kit2 (ACK2; mast cells) immunoreactive cells than males.



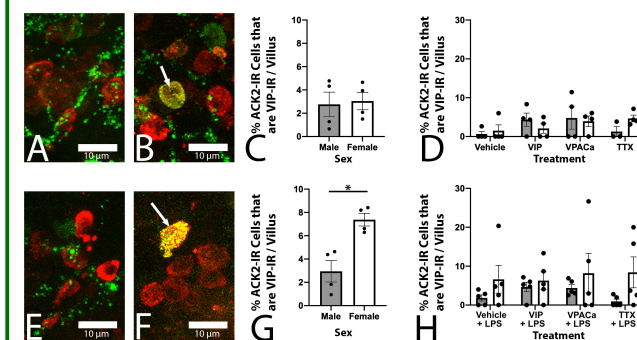
Organotypic slices from male ileum tissue had smaller ACK2-IR cells than females until challenged with lipopolysaccharide (LPS).



ACK2-IR mast cells within 1 µm of a VIP-IR fiber were larger than those not near a fiber, regardless of treatment or LPS challenge.



After LPS challenge, female ileal tissue increased the percentage of mast cells 'producing' VIP.



Future Directions:

Analysis of histamine by sex and across treatments to determine role of VIP in neuronal - mast cell secretion events.