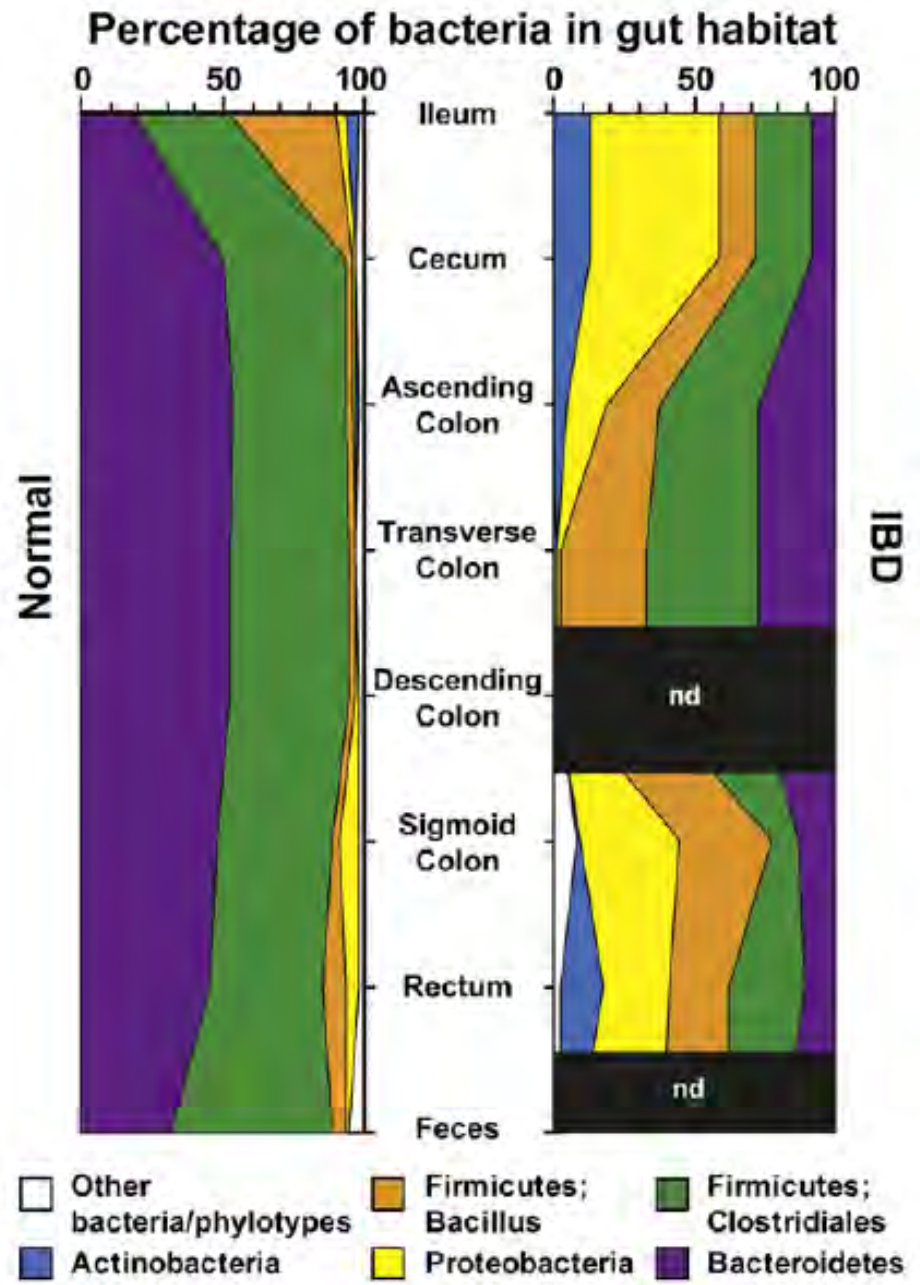
A fluorescence microscopy image of a zebrafish gut. The image shows a complex network of green and blue structures, likely representing the gut wall and its folds. A prominent feature is a large, irregularly shaped area of bright red fluorescence, indicating inflammation or a specific cellular marker. The background is dark, making the fluorescent structures stand out.

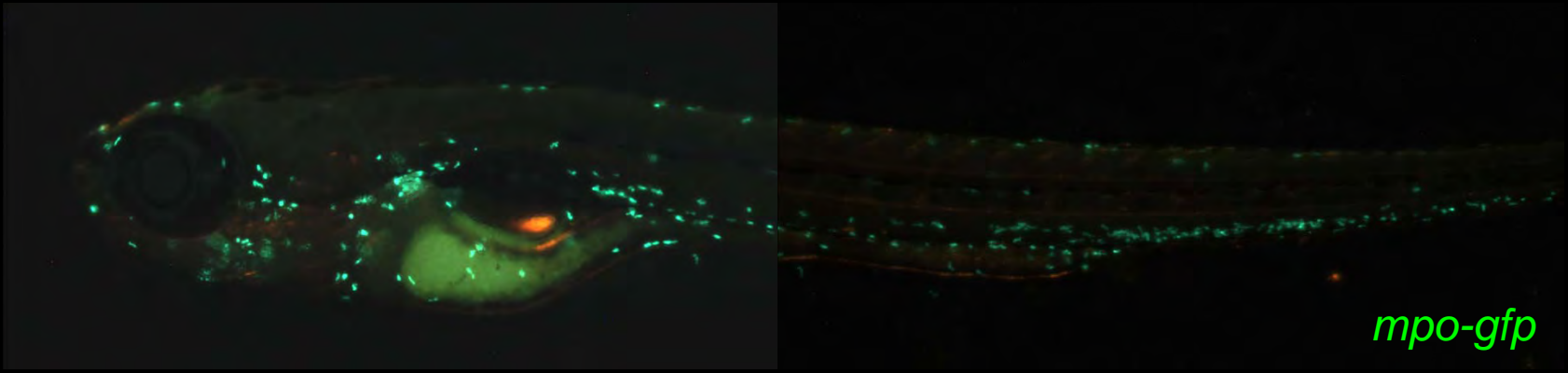
Transmissible intestinal inflammation revealed in a zebrafish model of gut hypomotility

Karen Guillemin
University of Oregon

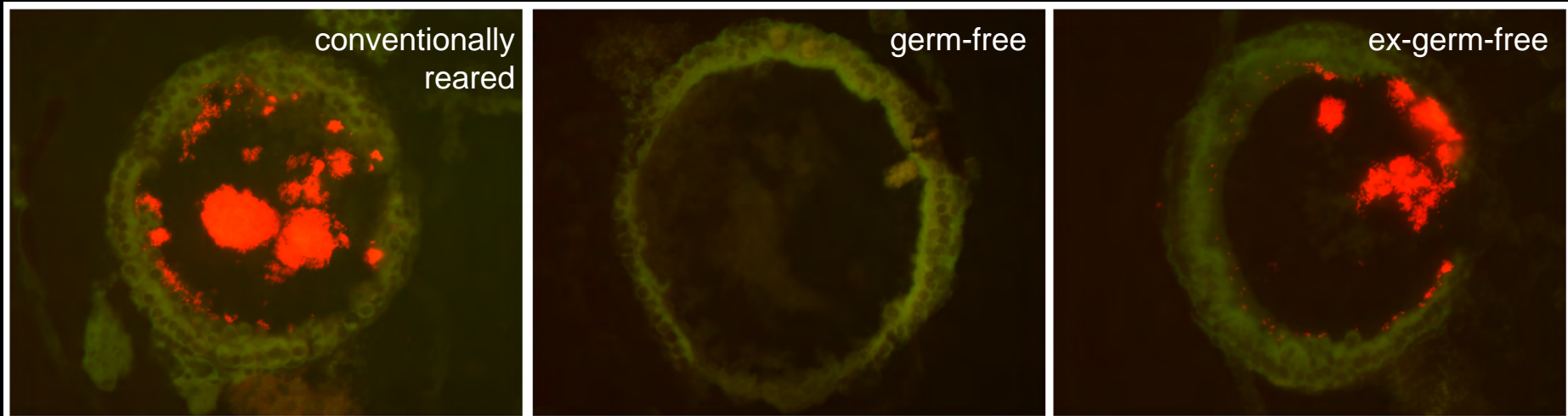
Seventh Annual
Broad Medical Research Program
Investigator Meeting
February 12-13, 2009



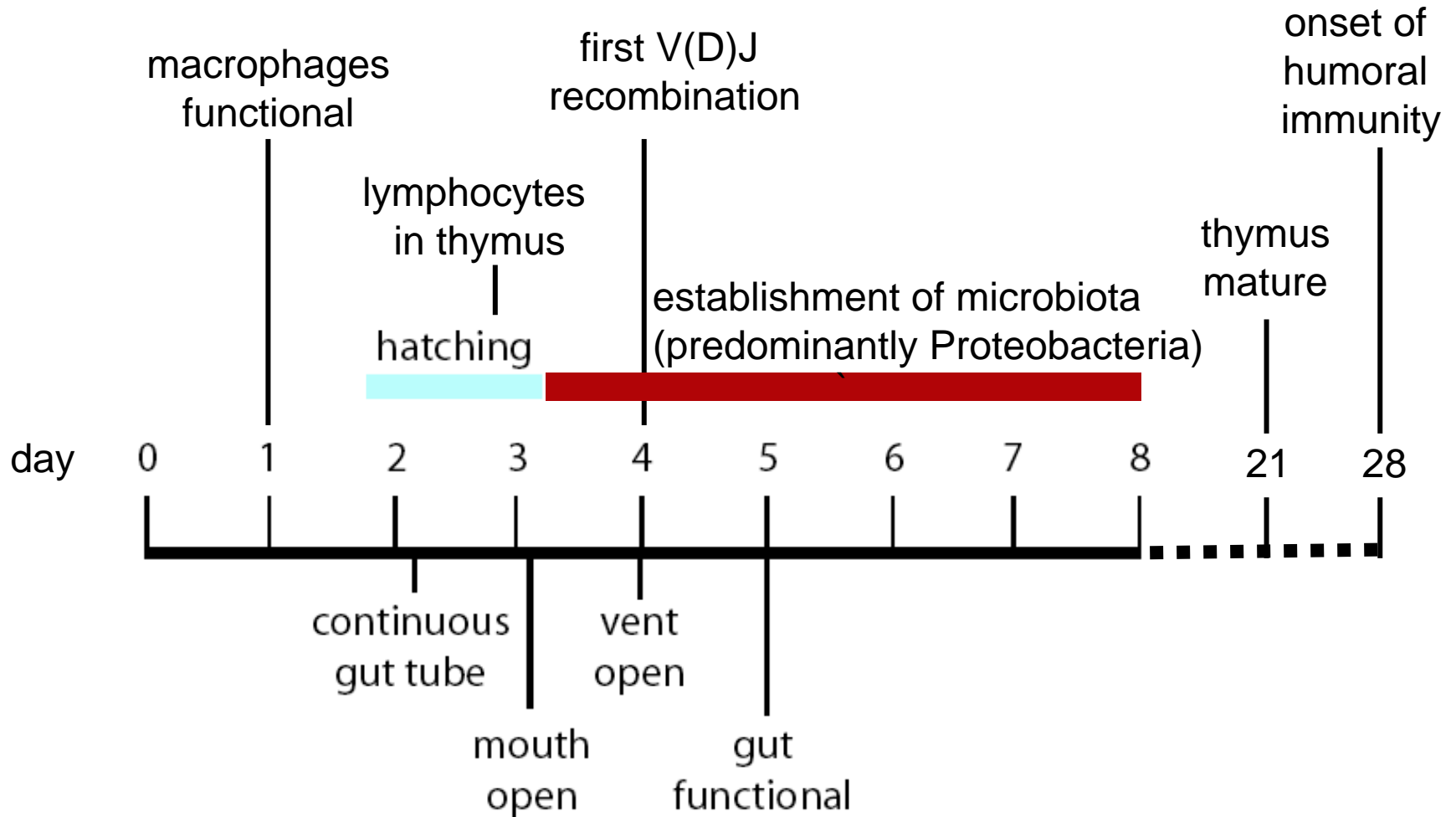
The zebrafish model



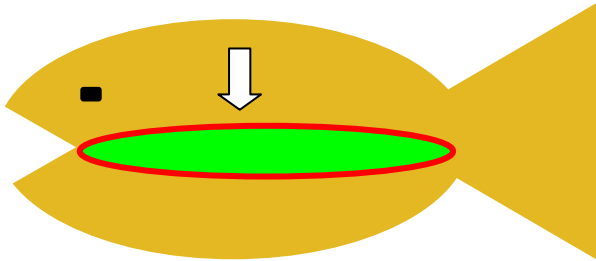
- Zebrafish guts and immune system resemble mammals
- We can manipulate zebrafish genes
- We can manipulate zebrafish microbiota



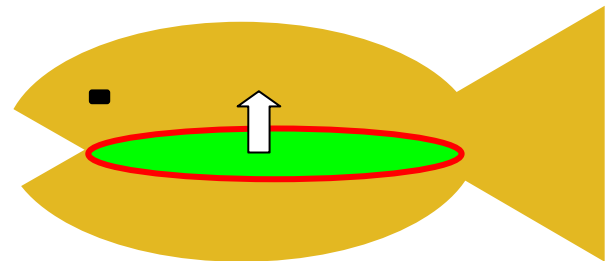
Important events in zebrafish development



What causes excessive intestinal inflammation?



Dysfunctional host response to microbes?

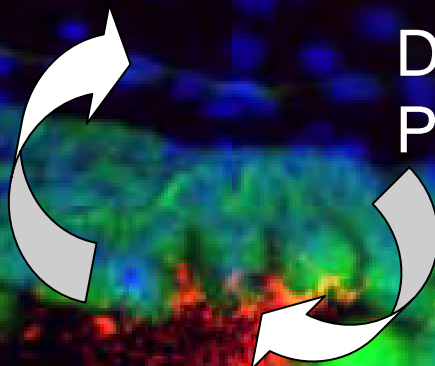


Dysfunctional microbial community?

DAPI
Autofluorescence
Eubacteria

Microbiota-associated LPS induces
Intestinal alkaline phosphatase

Detoxifies LPS
Promotes mucosal tolerance

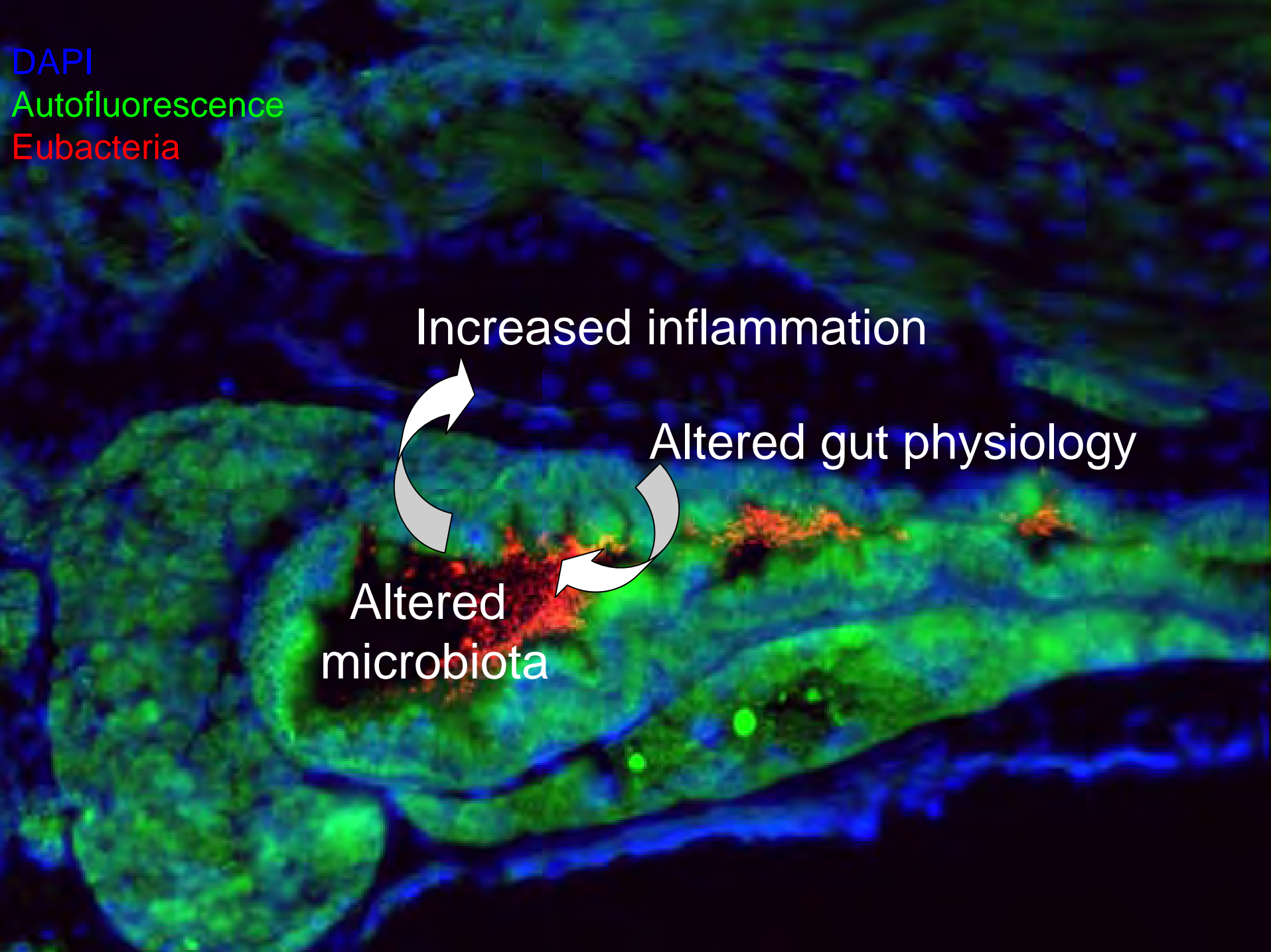


DAPI
Autofluorescence
Eubacteria

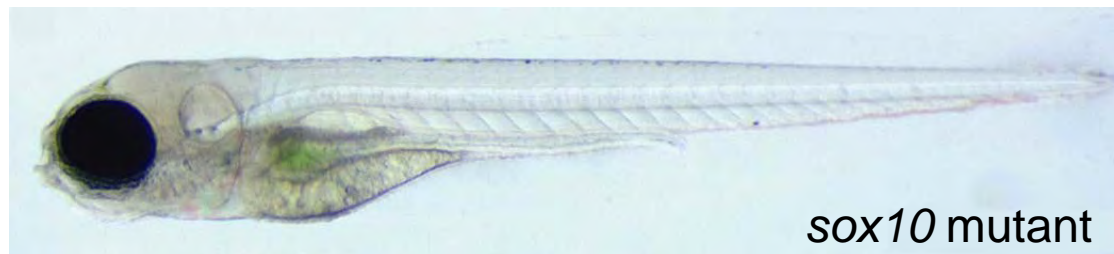
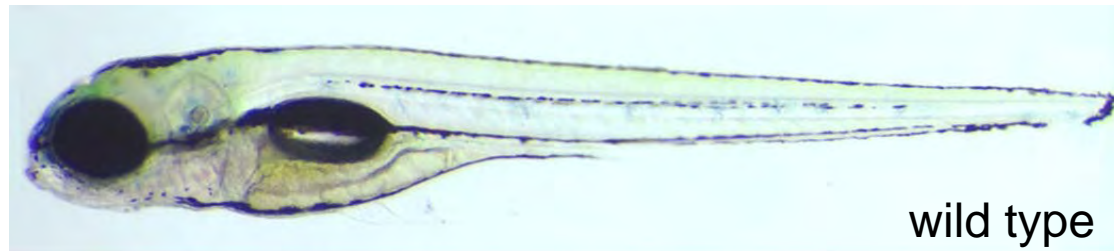
Increased inflammation

Altered gut physiology

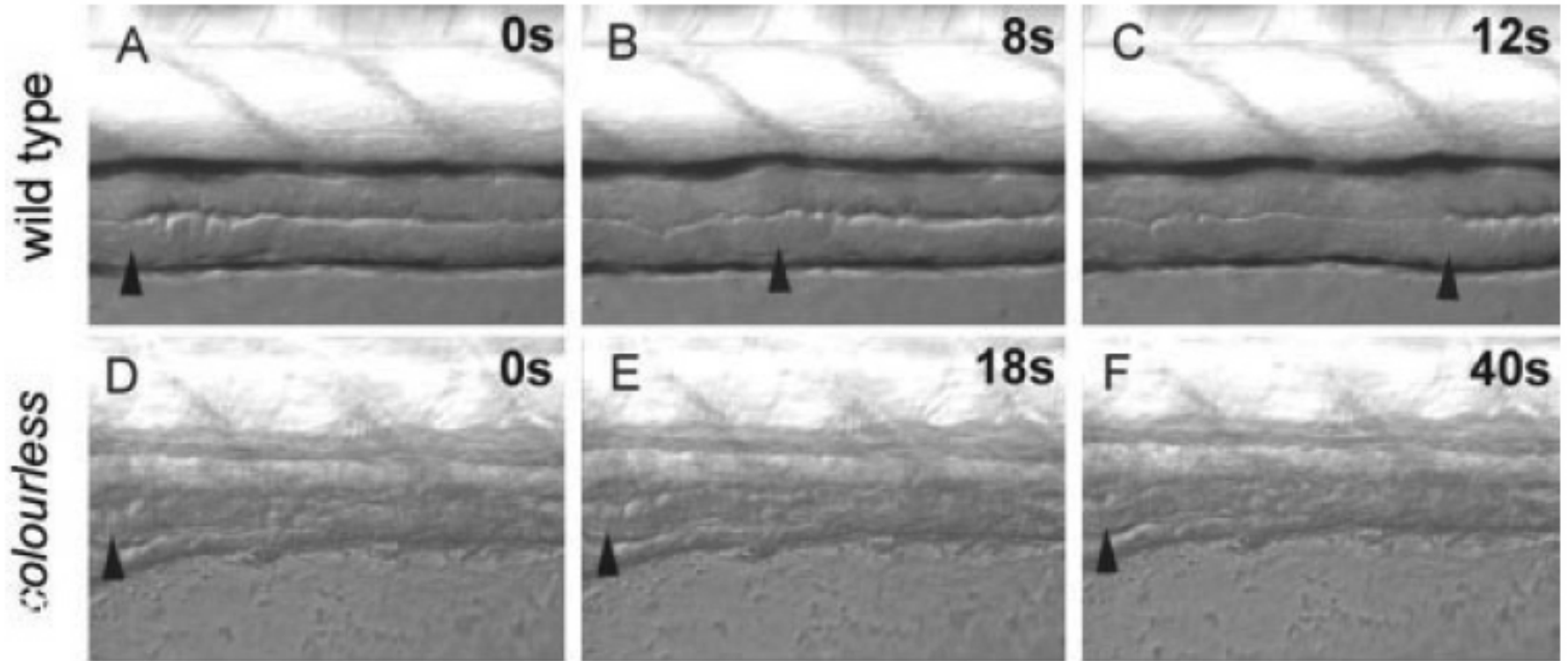
Altered
microbiota



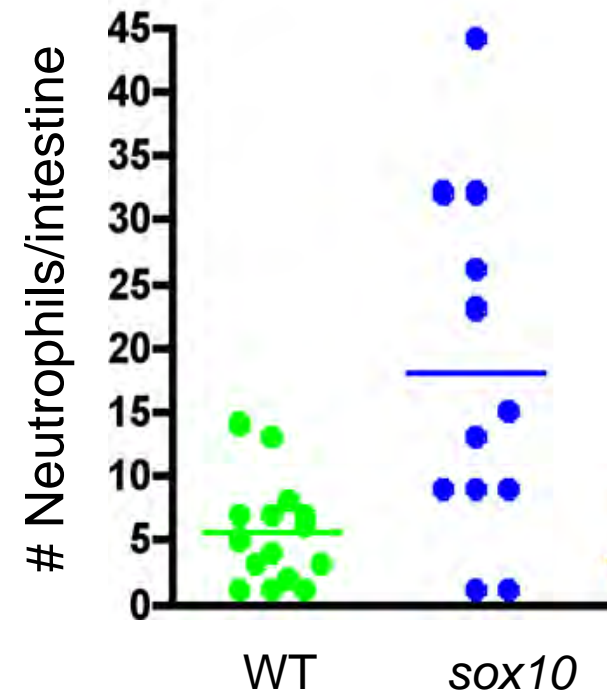
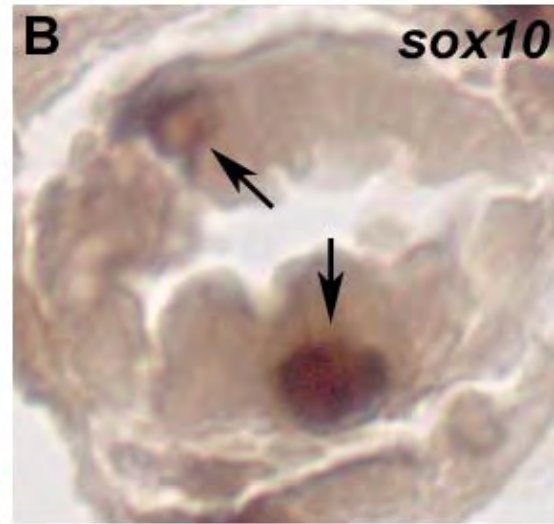
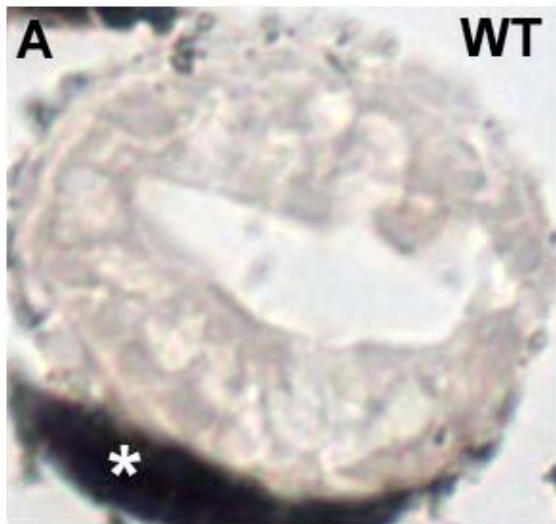
sox10 mutants lack enteric neurons



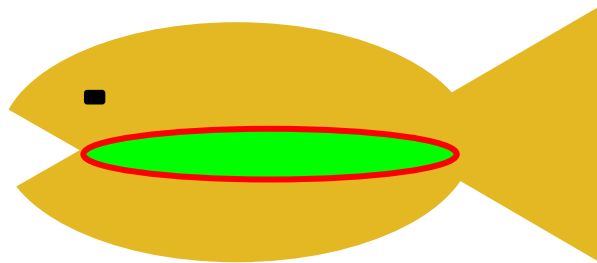
sox10 mutants lacks gut motility



sox10 mutants have increased numbers of intestinal neutrophils



Is inflammation caused by the bacteria or the host?

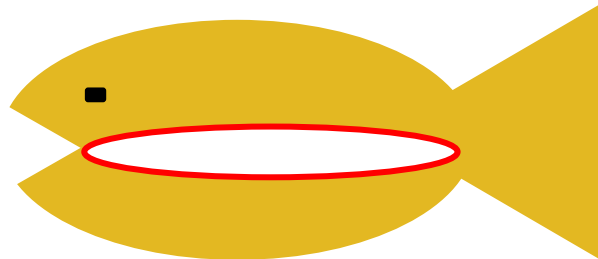


inflamed mutant

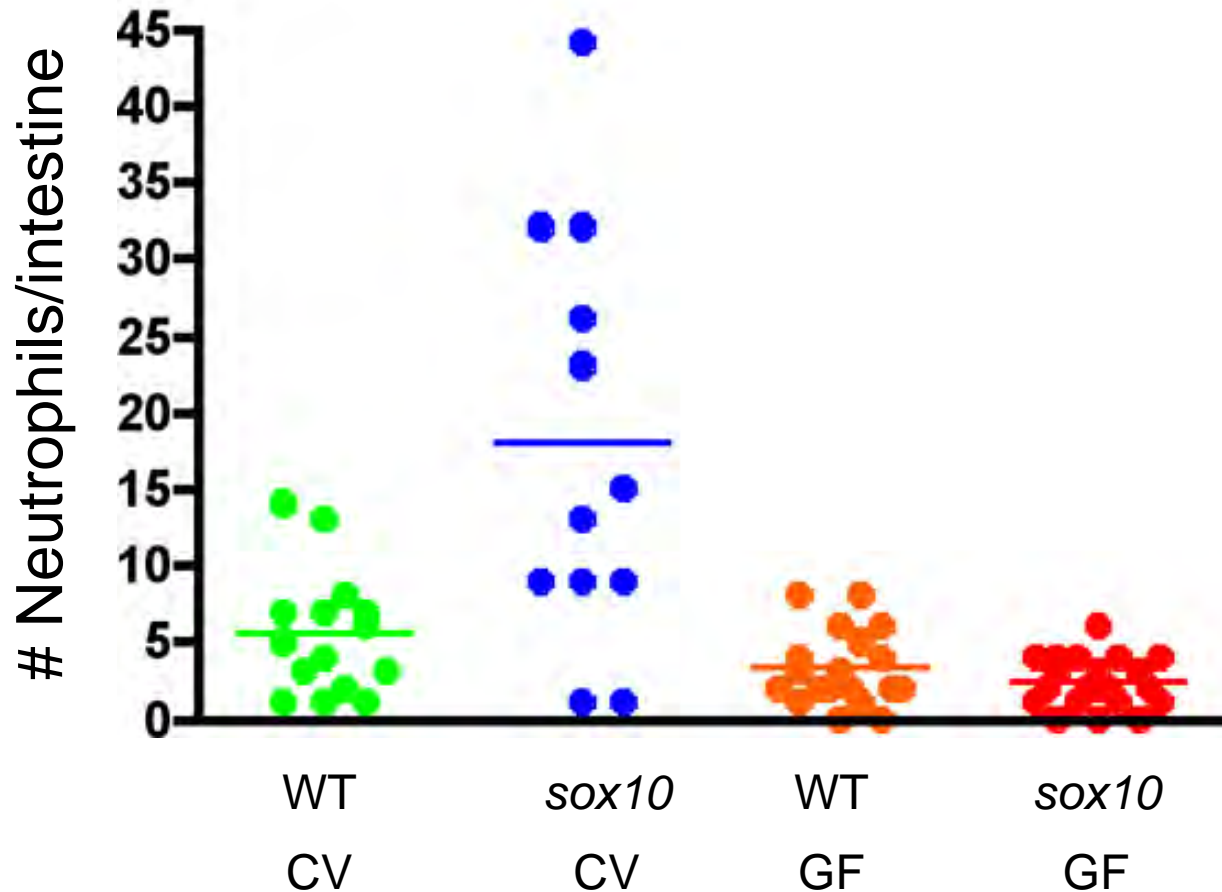
derive
germ-free
→



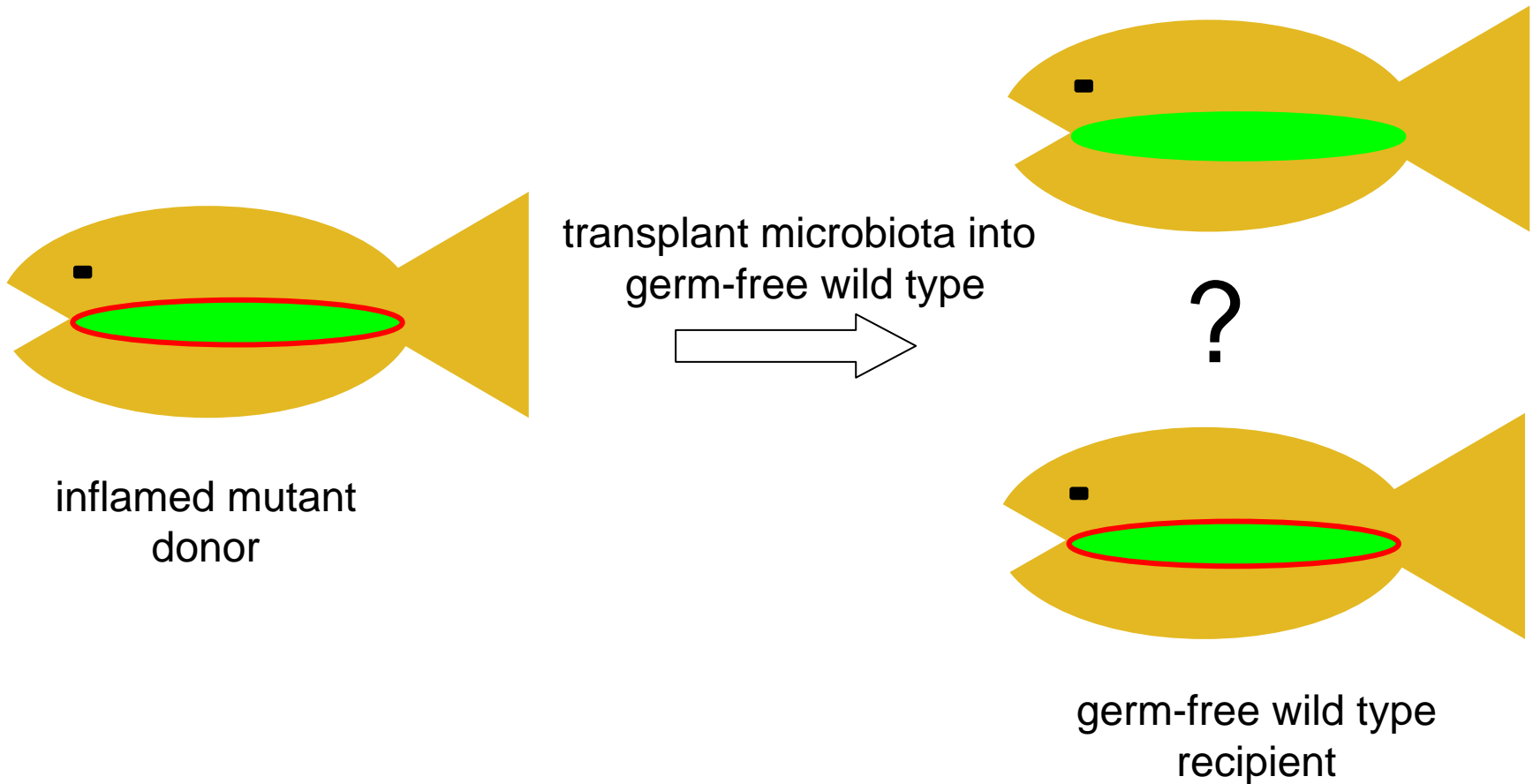
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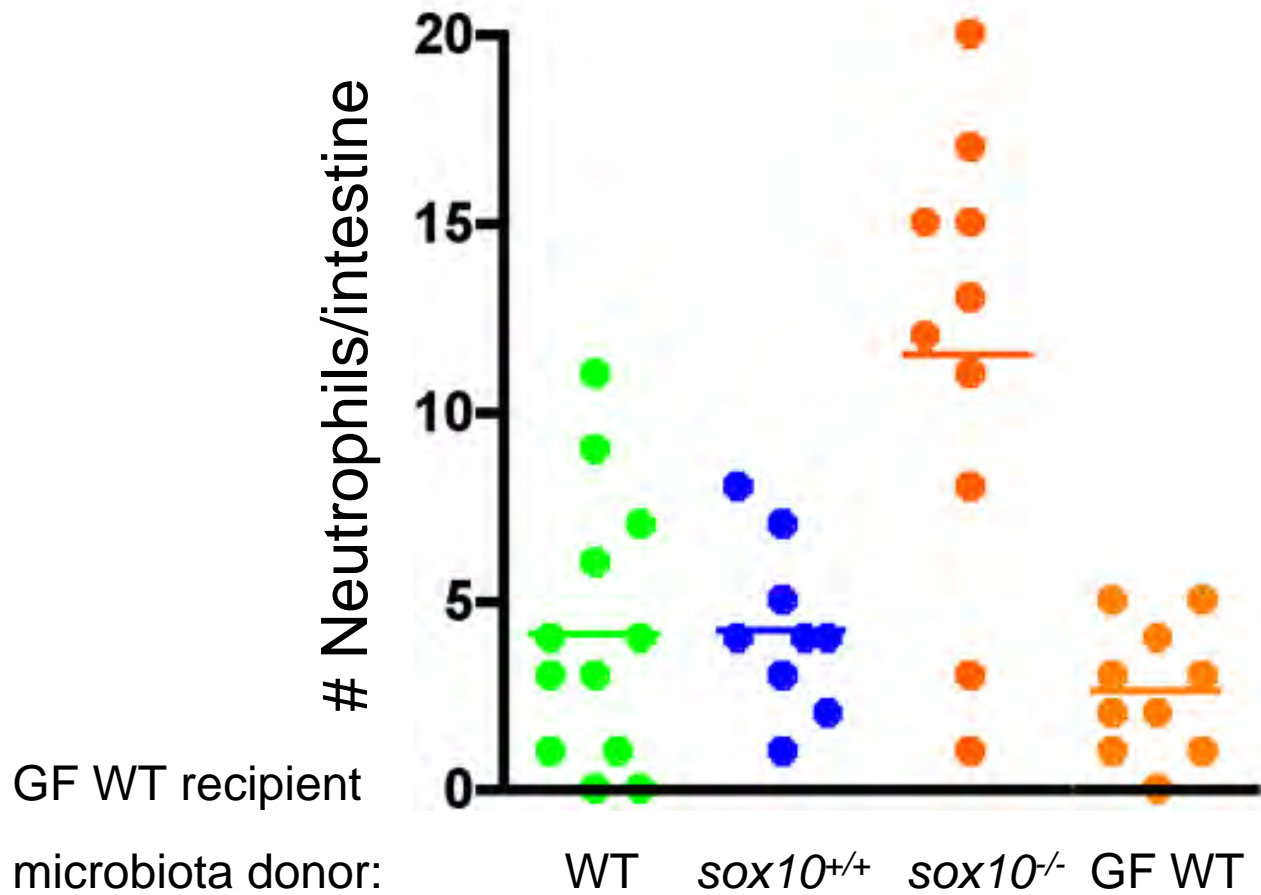
Inflammation in *sox10* mutants is due to the microbiota



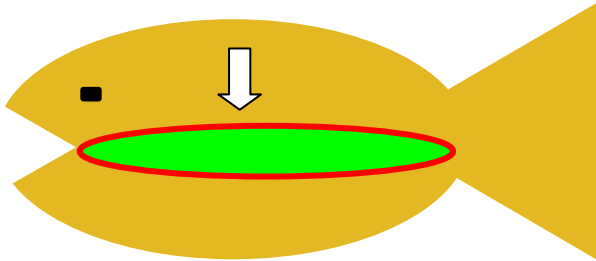
Is inflammation caused by the bacteria or the host?



sox10 mutants causes transmissible intestinal inflammation

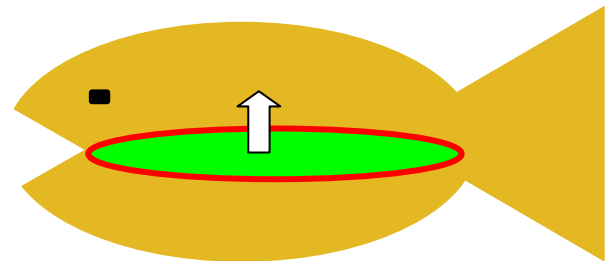


What causes excessive intestinal inflammation?



Dysfunctional host response to microbes?

Reduced intestinal alkaline phosphatase



Dysfunctional microbial community?

Microbiota of *sox10* mutant

Current

John Goers
Jon Muyskens
JT Neal
Anica Wandler
David Reid

Former

David Baltrus
Crystal Botham
Kevin Bourzac
Lucy Cho
Kevin Hicks
Bethany Rader

Collaborators

Judith Eisen
Julie Kuhlman
Kristin Alligood



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Zac Stephens
Ye Yang
Rose Gaudreau

Former

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Sarah Cheesman
Janie Akerlund
Katy Baden
Barb Seredick
Julie Toplin