



**The Role of PHA-4/FoxA Transcription Factor in Establishing the Cellular Context for *in vivo* forced Transdifferentiation**

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Mentor: Misty Riddle

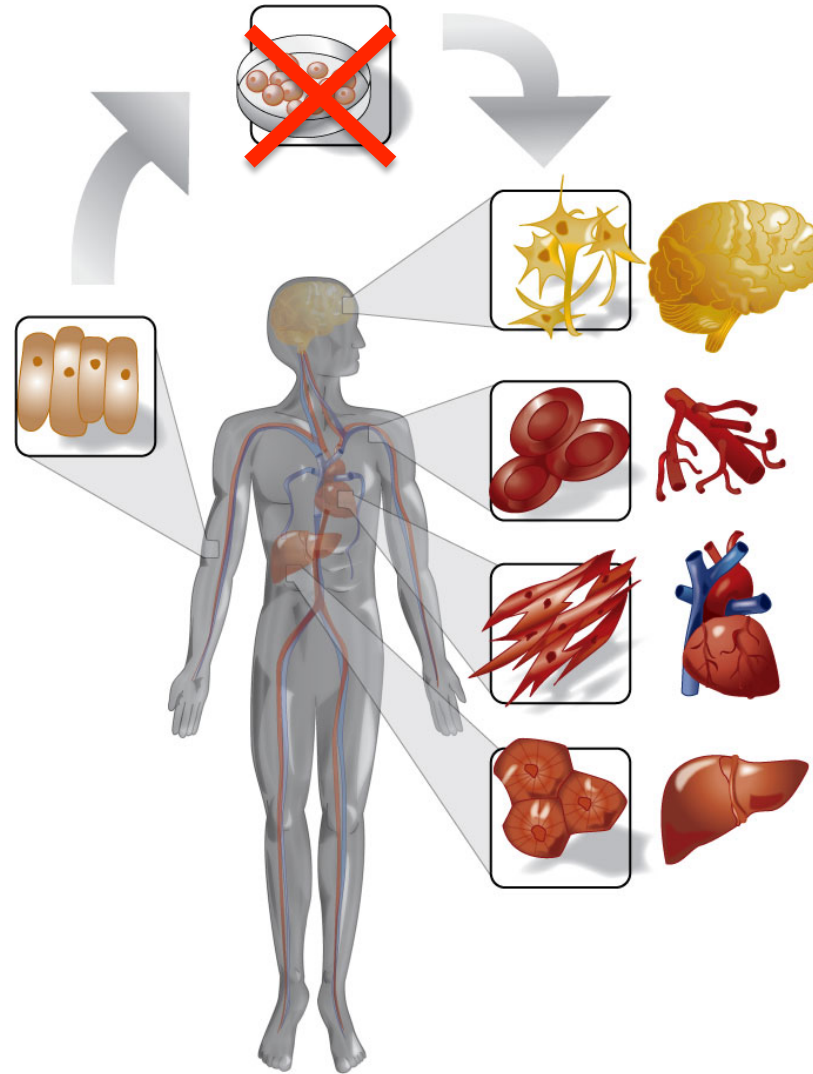
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# Transdifferentiation alternative path to treat damaged organs



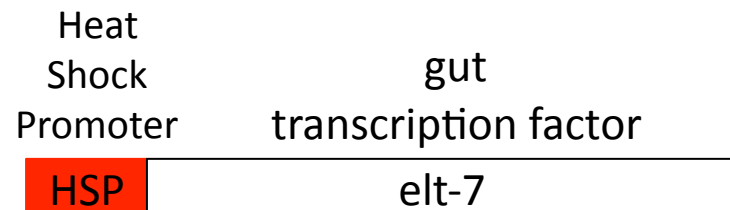
# The Model Organism: *Caenorhabditis elegans*

Hermaphrodite

Males



# How we ask cells to change identity in *C. elegans*



elt-2

Gut promoter::green fluorescent protein (GFP)

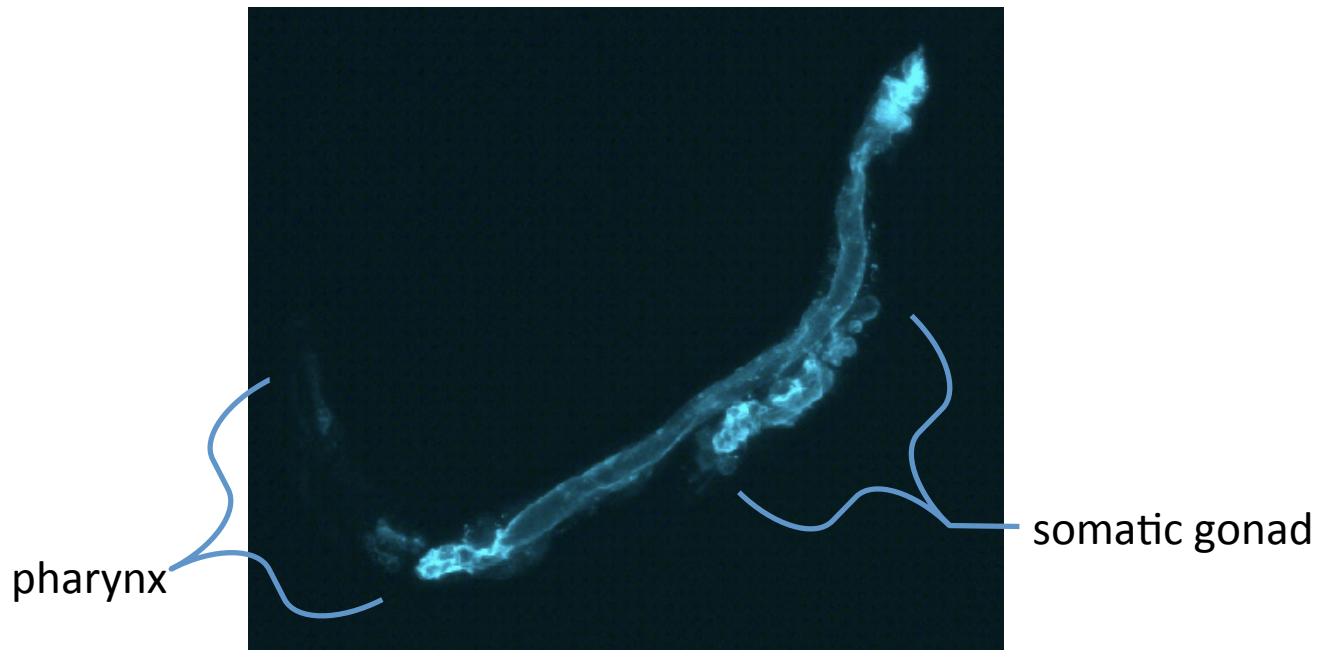
IFB-2

Gut promoter::cyan fluorescent protein (CFP)

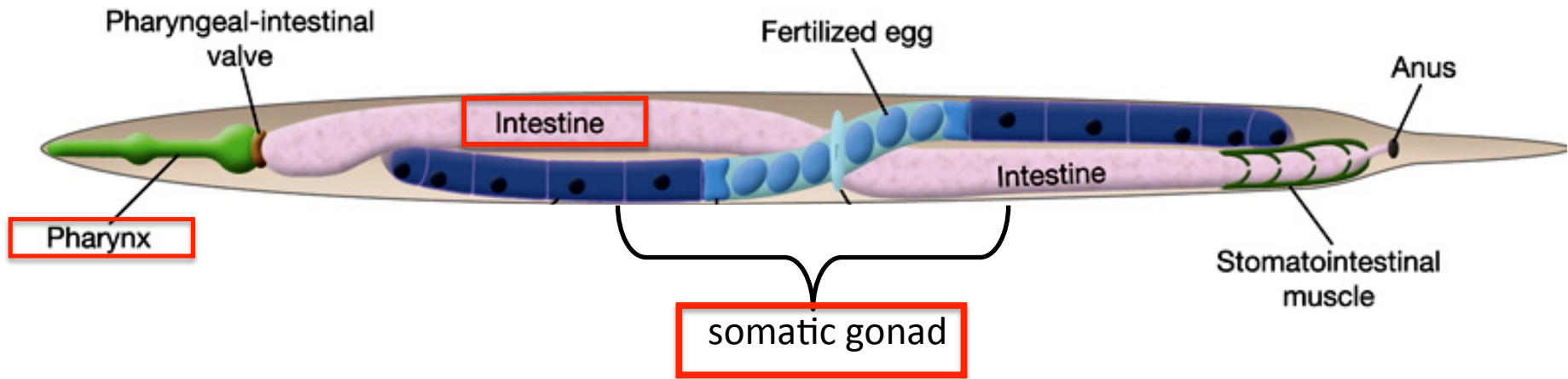


Normal Expression

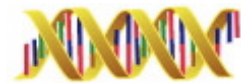
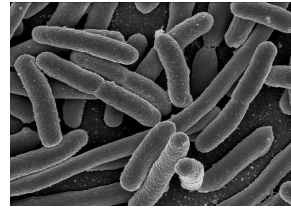
# The Pharynx and Somatic Gonad Transdifferentiate into Intestine; Why?



# PHA-4 is expressed in the pharynx, intestine, and somatic gonad



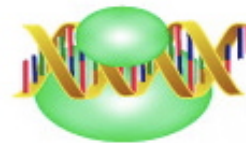
# RNA interference of PHA-4



double stranded RNA



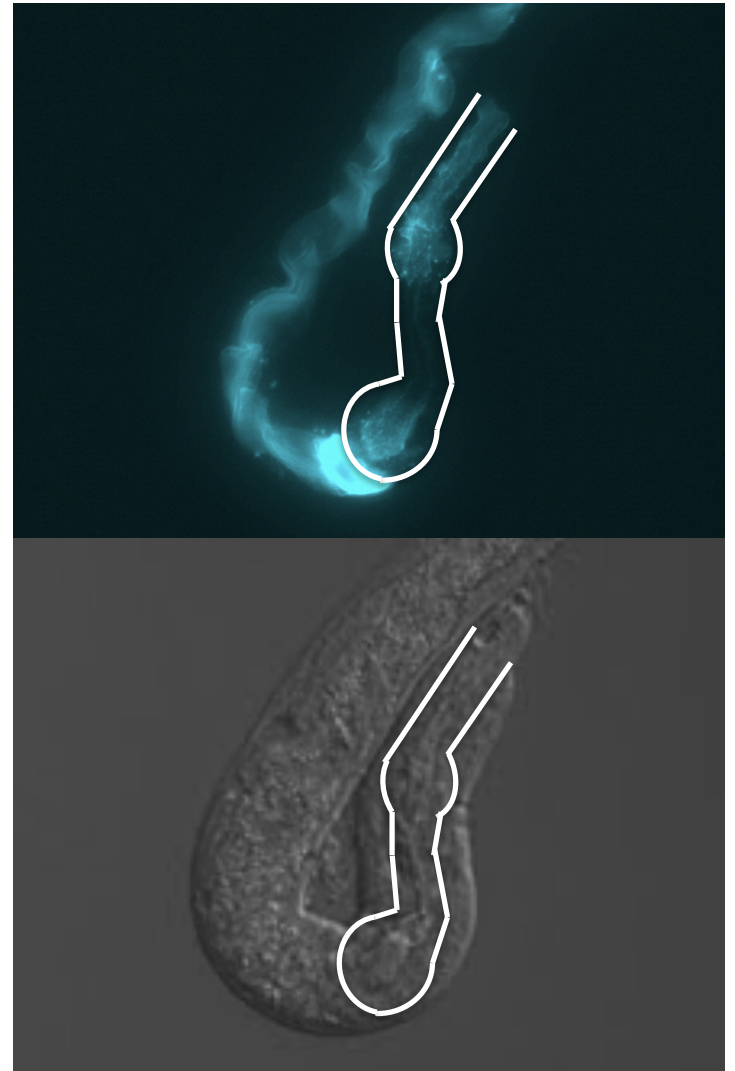
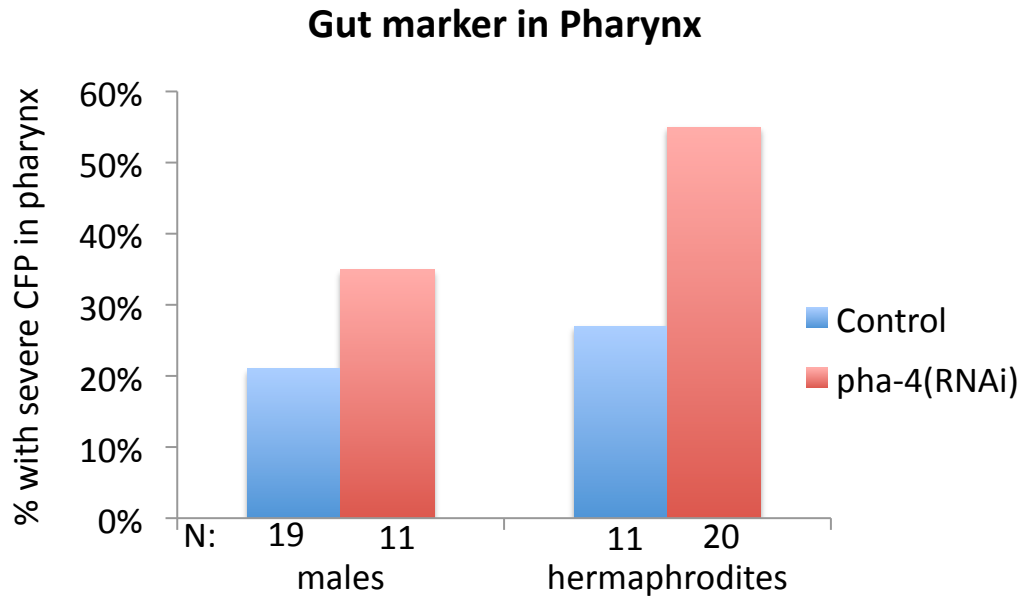
RNA induced silencing complex



Target mRNA



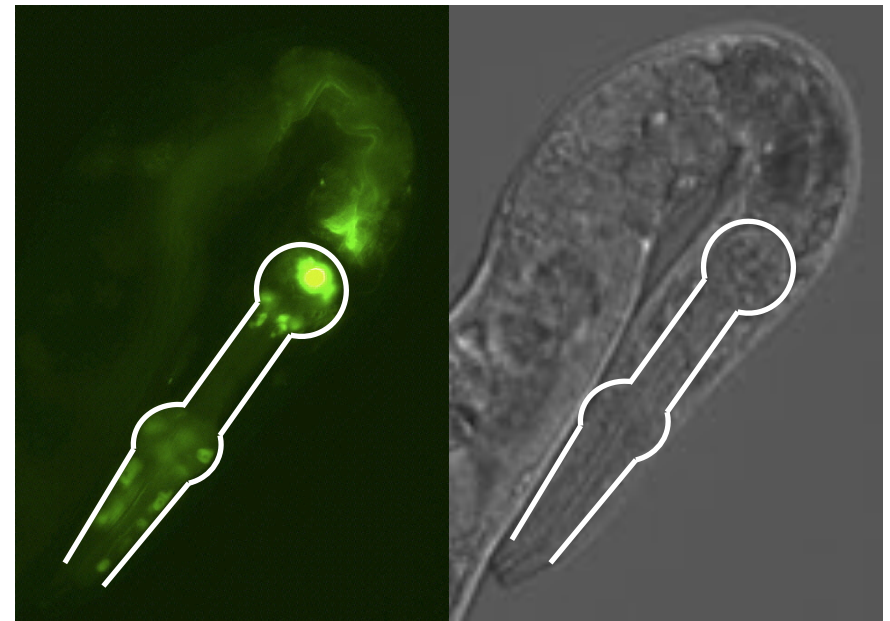
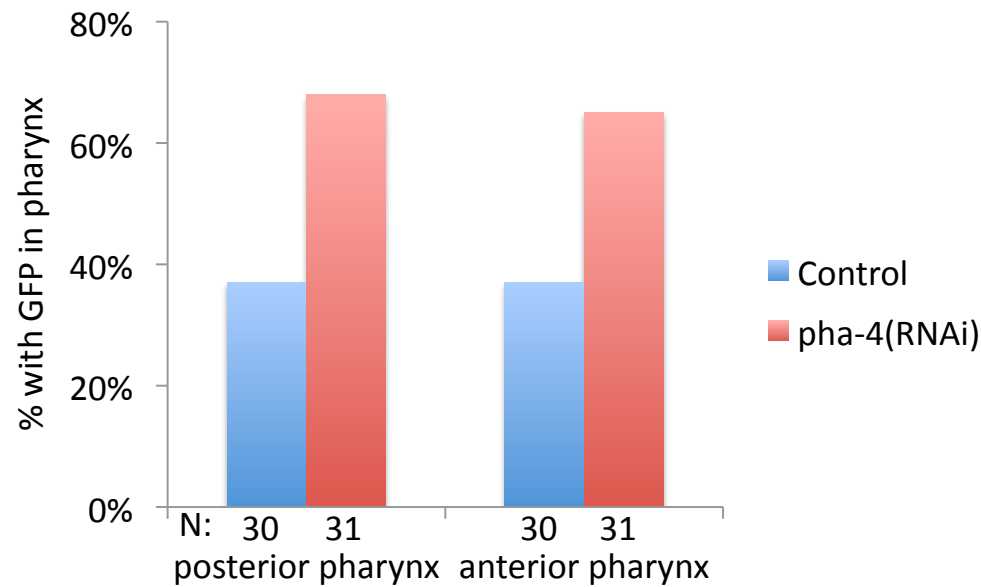
# IFB-2 expression is increased in pharynx of PHA-4 depleted worms



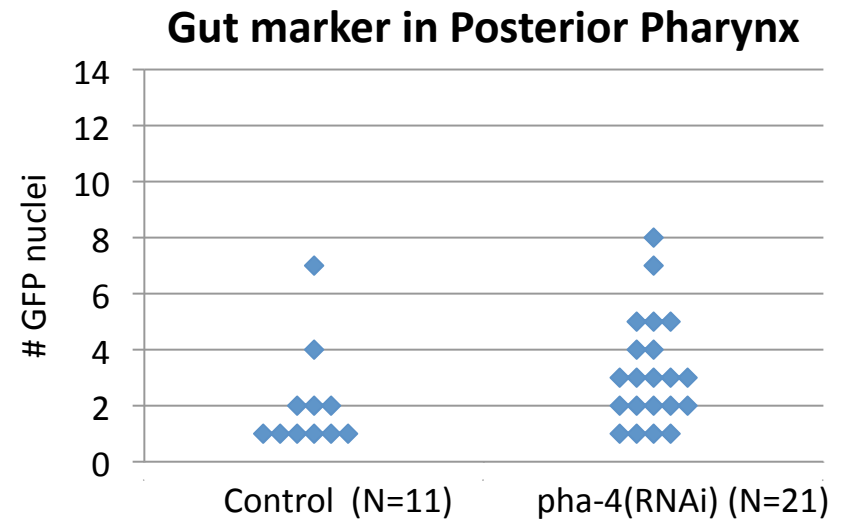
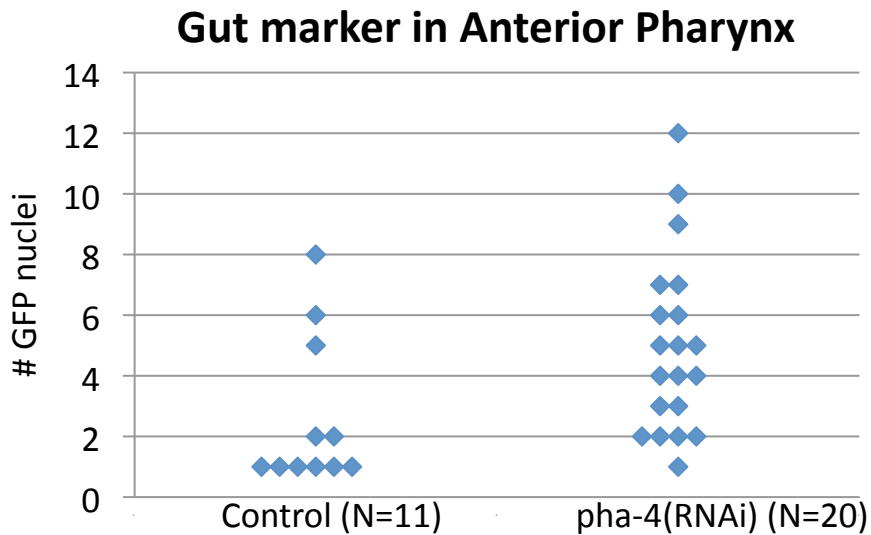


# *elt-2* expression is increased in pharynx of PHA-4 depleted worms

### Gut marker in Pharynx

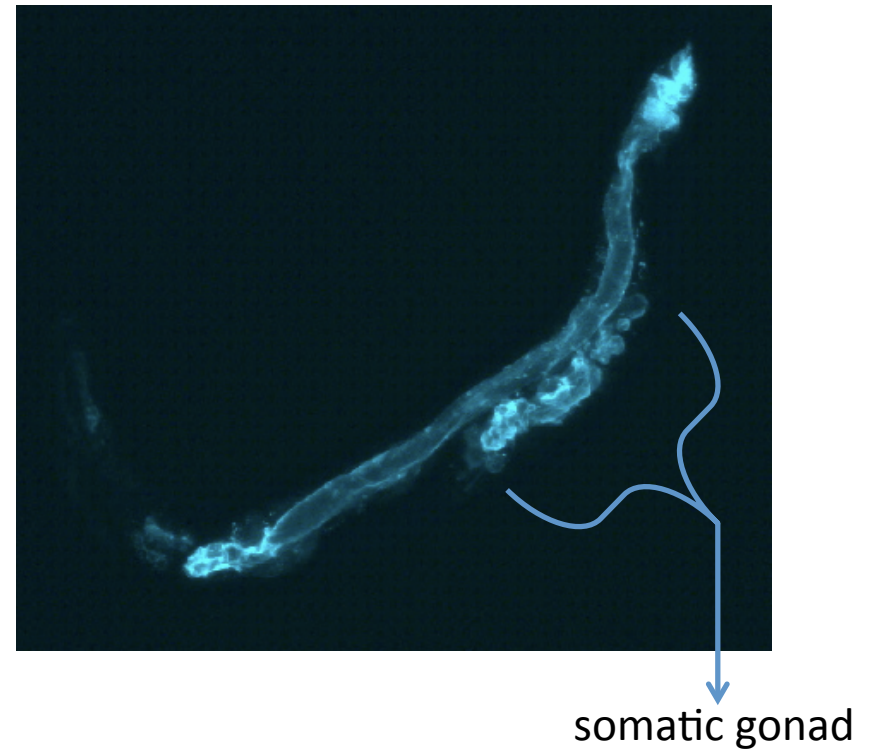
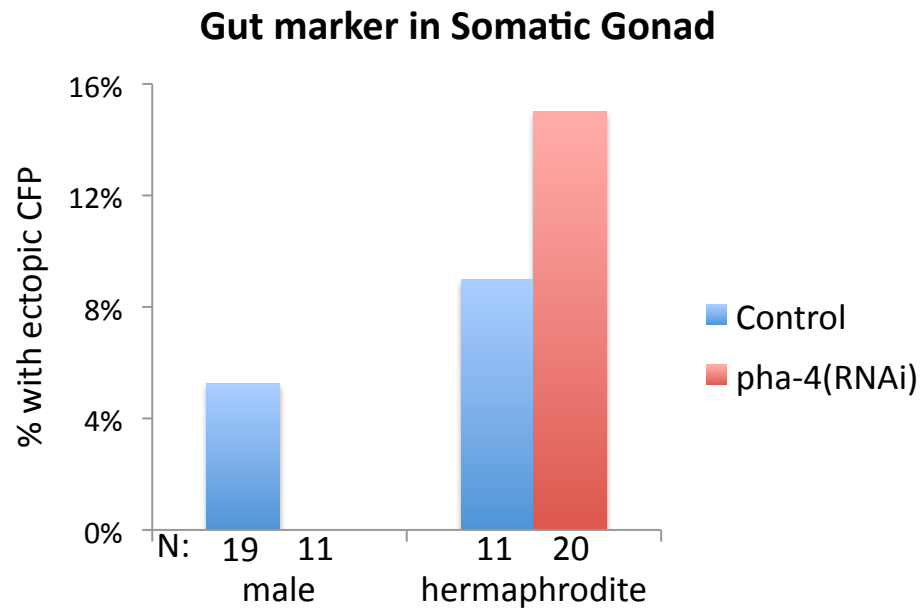


# Increased number cells with of gut marker in pharynx after PHA-4 depletion



◆ one *C. elegans*

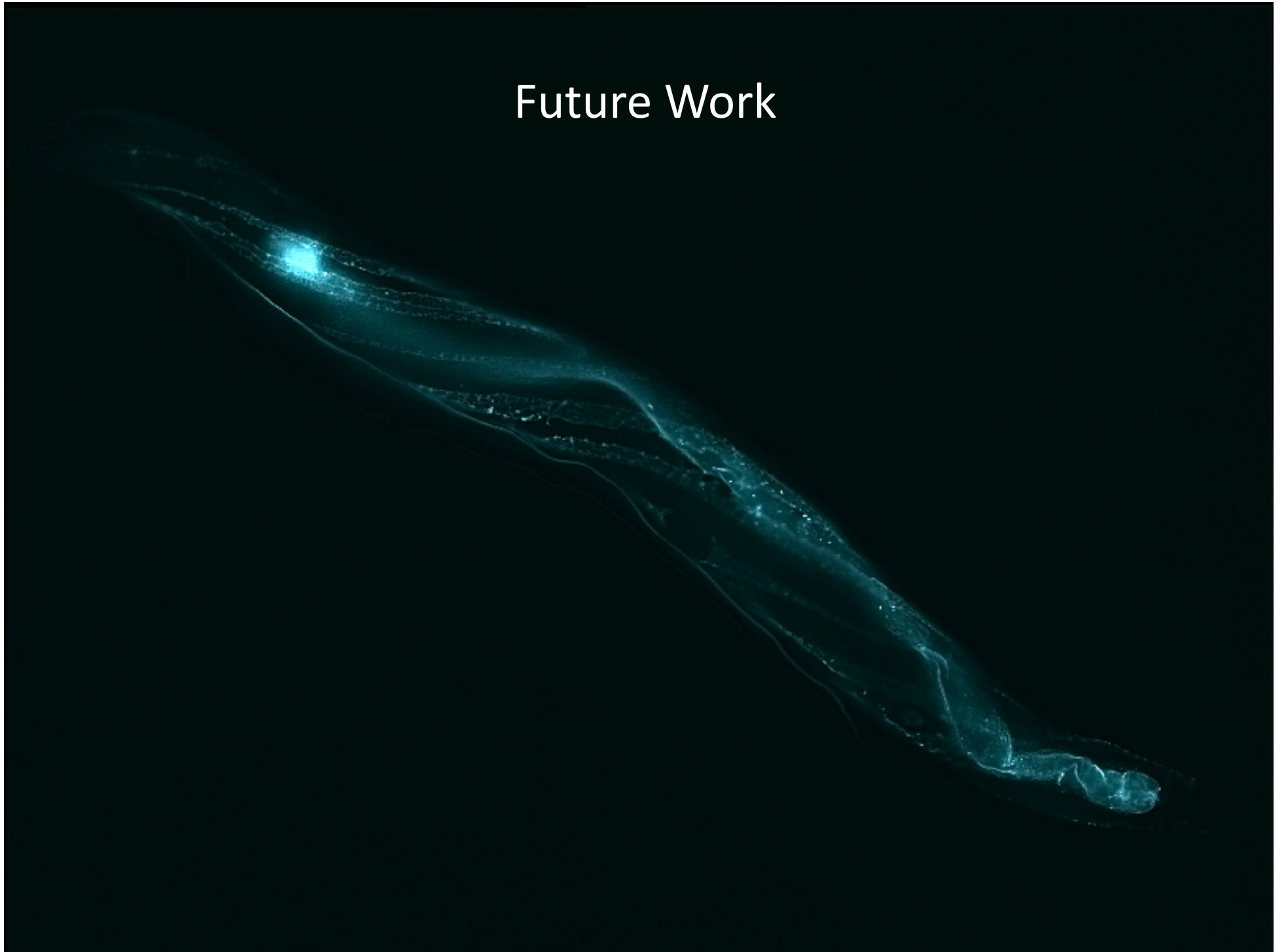
# Percent worms with IFB-2 in somatic gonads decrease in males and increase in hermaphrodites



PHA-4 is not necessary for ectopic gut differentiation in pharynx and uterus

- Increased Cyan and Green gut marker in pharynx of PHA-4 depleted worms
  - Look into other genes responsible for preventing transdifferentiation of pharyngeal cells
- Cyan gut marker in uterus, but not in vas deferens

# Future Work



# Acknowledgements

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