



Investigating the Role of Dosage Compensation in *D. melanogaster* Sex-specific Aging Differences

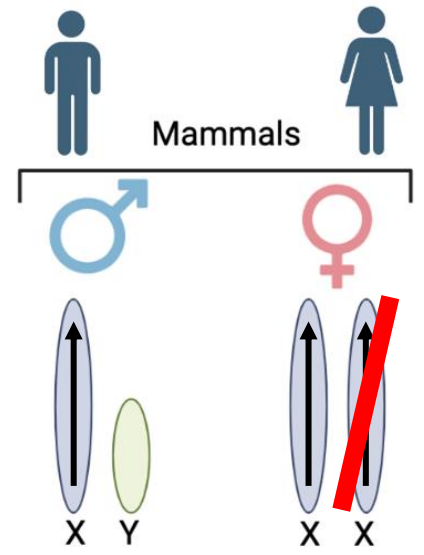


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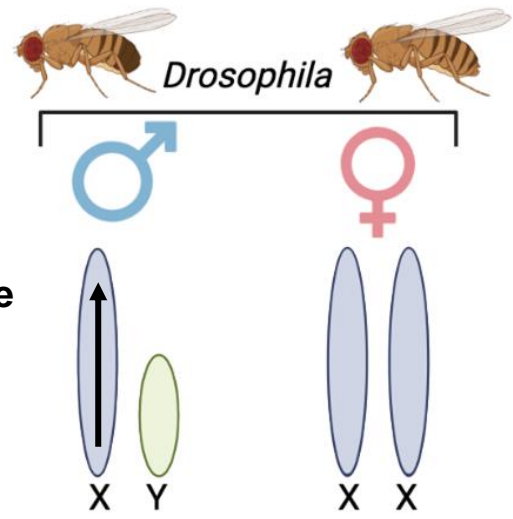


Context/Background

- 1. Upregulation of all X-chromosomes
- 2. Inactivation of a single female X-chromosome



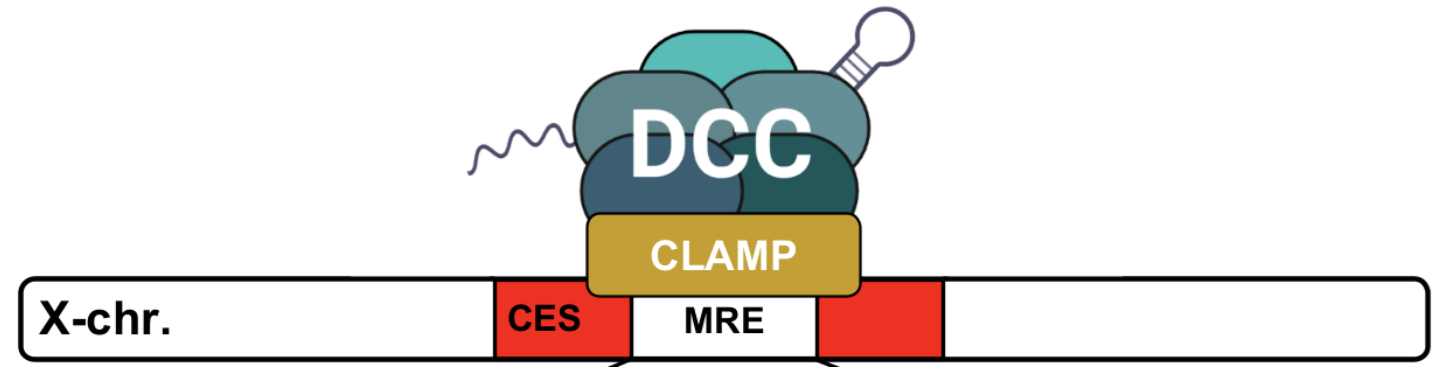
- 1. Upregulation of the male X-chromosome



How do X-linked genes continue to impact *Drosophila* as they age?

Given that X-linked gene expression is modulated by dosage compensation in male *Drosophila*, inhibiting the DCC could provide insight into how the X controls sex-based aging.

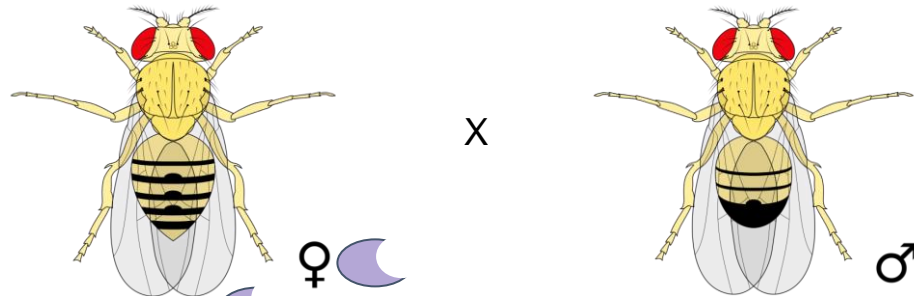
Drosophila Dosage Compensation Complex (DCC)





Methods/Results

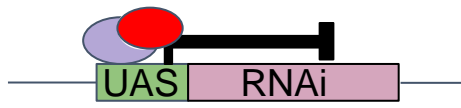
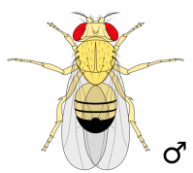
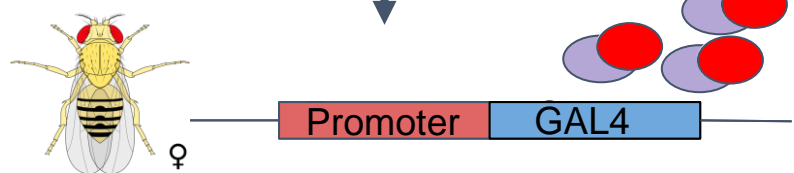
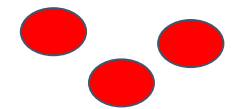
UAS GAL4 Geneswitch System



- RNAi's:
- GFP (control)
 - CLAMP
 - MLE



RU486 Food



Methods

- Lifespan Assay
- qPCR to quantify RNA on the X (roX) expression
- Western Blot to quantify CLAMP protein expression
- RNAseq and ATACseq analysis for specific X-linked genes

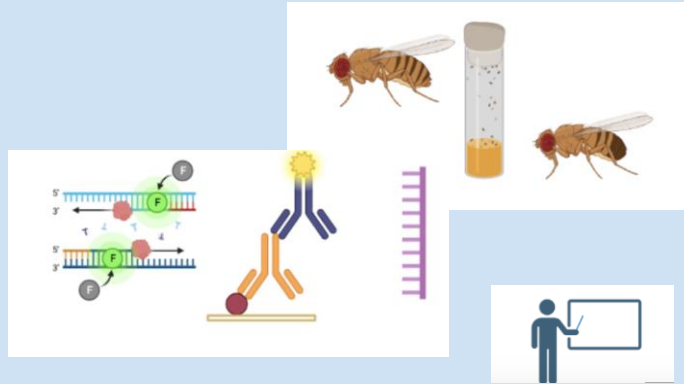
Prospective Result:
 Male RU486 feeding flies with CLAMP or MLE RNAi's show decreased longevity and roX transcription



Conclusion

What I have learned or will still learn

- Drosophila care
- Wet lab techniques
- Multi-omics
- Scientific project management and Presenting



Future directions

- Dosage compensation, the X chromosome, and sex-based aging in other species (i.e. humans)
- Using computational genomic methods to better understand these processes

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IISAGE Consortium



Connection to IISAGE Themes

- Sex determination and Genome Architecture
 - Dosage Compensation and Sex Chromosomes
- Evolutionary Systems Biology
 - RNAseq and ATACseq to elucidate the basis of sex-based aging

