

**Strain Specific Variance in Maximum Sustained Swim
Speed (U_{crit}) Values in *Danio rerio* (Zebrafish)**

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Genetic Variation

- Genetic Mutations (Nuclear and Mitochondrial Genomes)
- Differential Expression
- Repeated Genes - Copy Number Variation (CNV)

Zebrafish as a Model Organism

- High Fecundity
- External Fertilization
- Robust and Adaptable
- Large amount of copy number variation
- What does variation look like in Zebrafish?

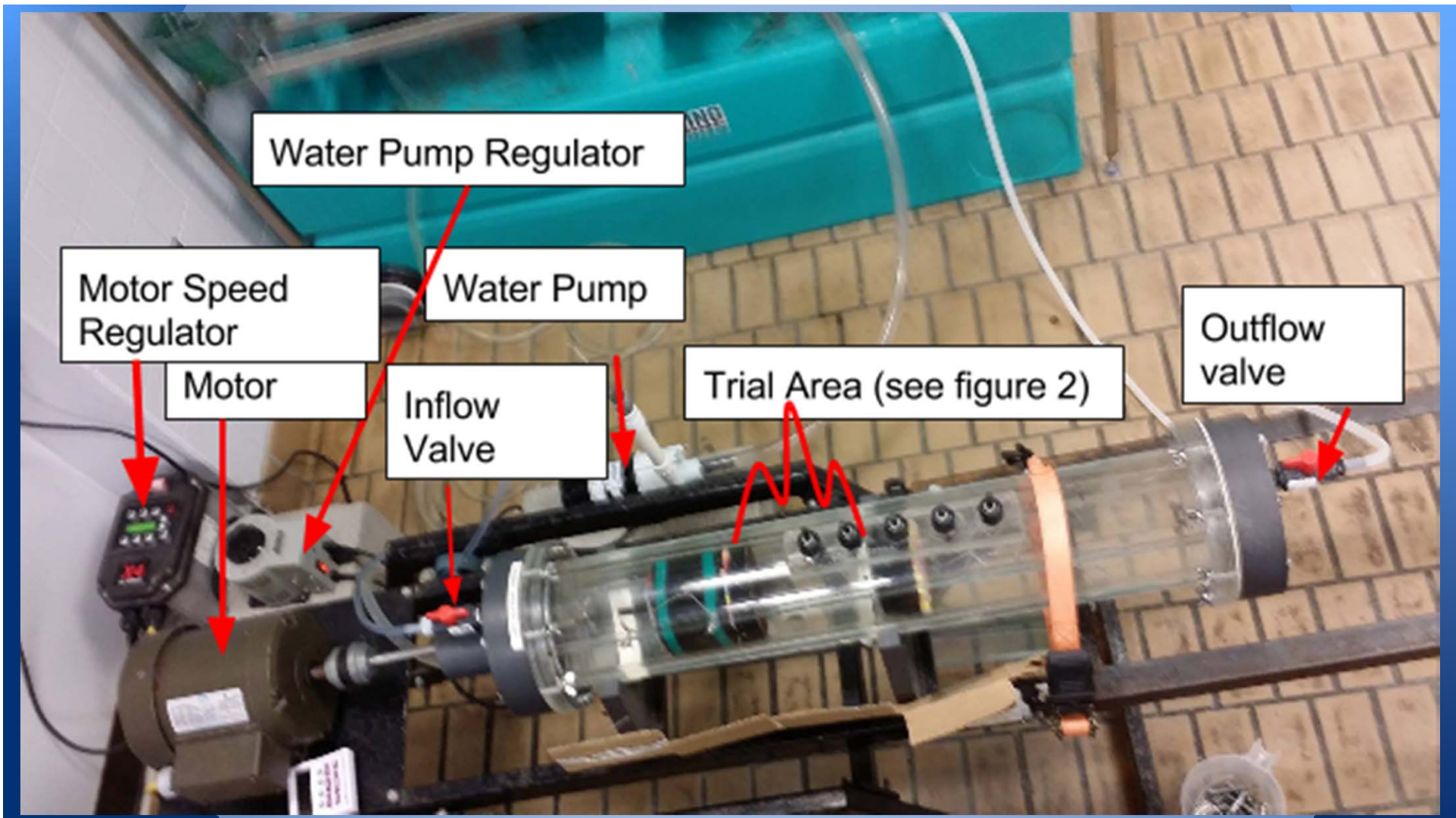


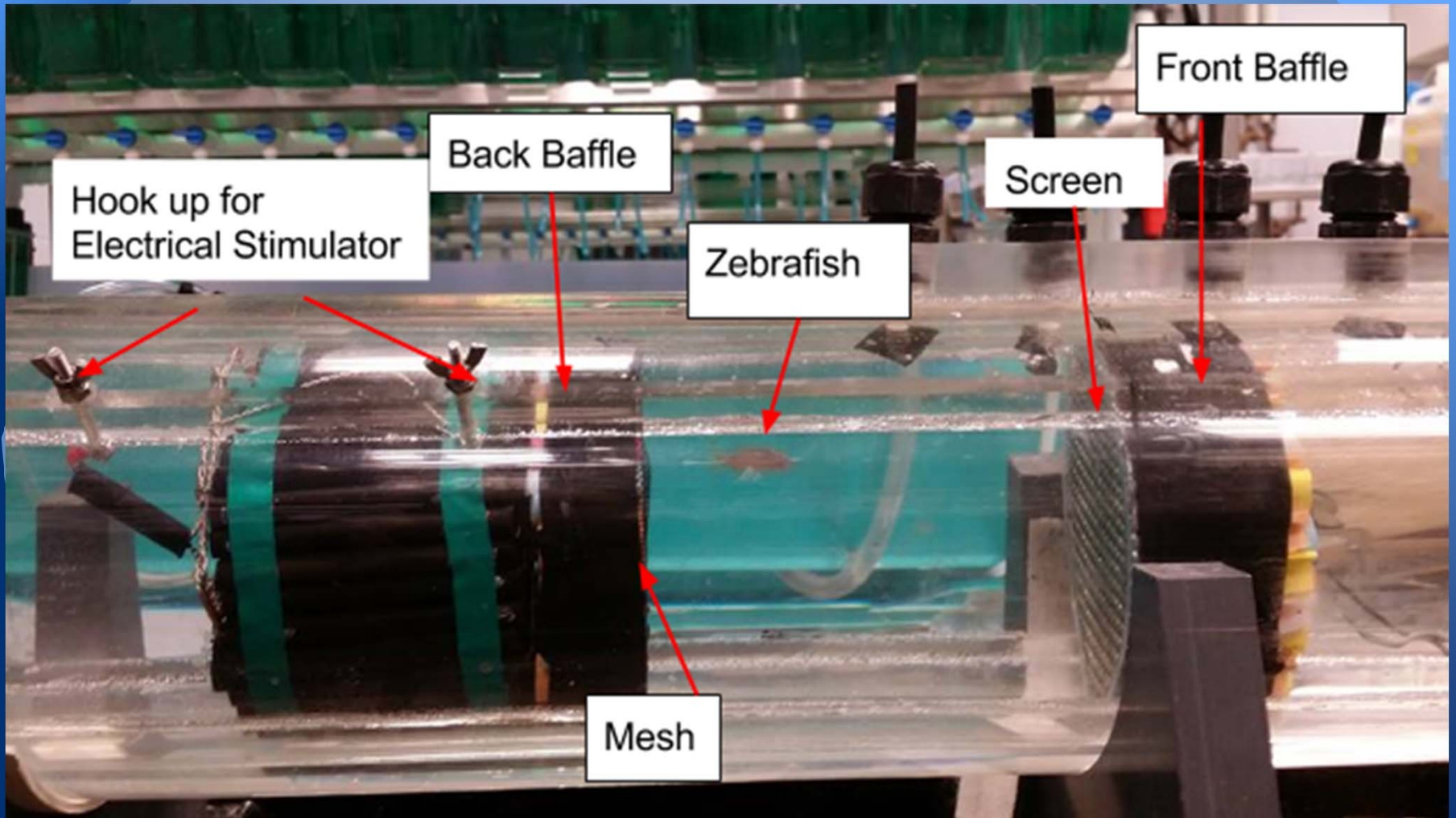
Zebrafish Rearing Conditions



Measuring Inherent Variation in Zebrafish: Variable Speed Swim Tunnel







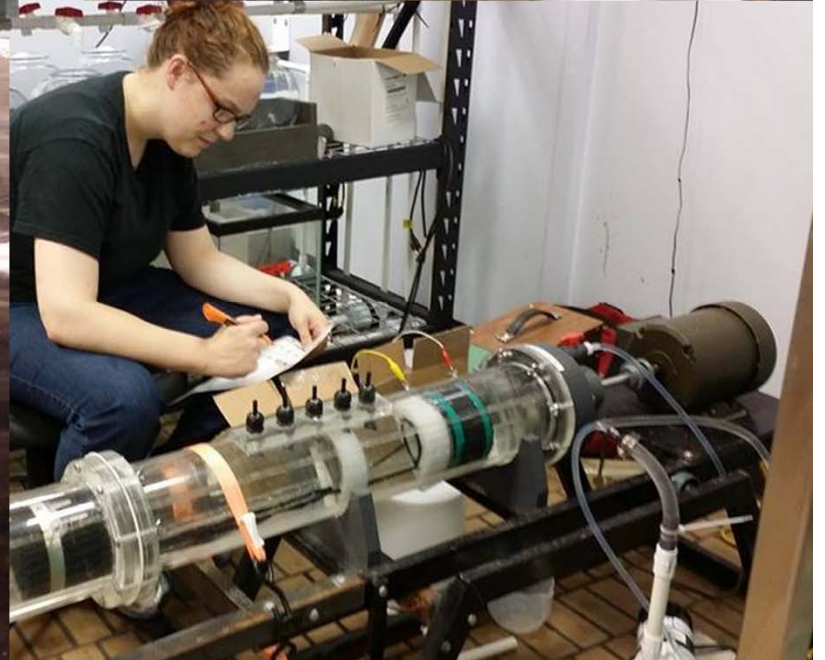
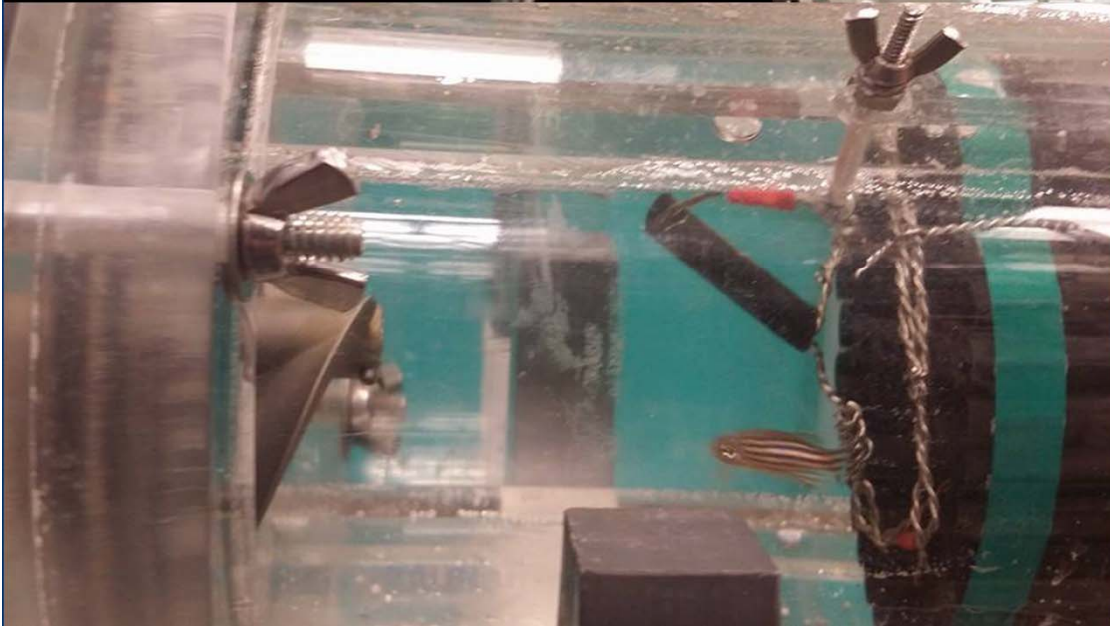
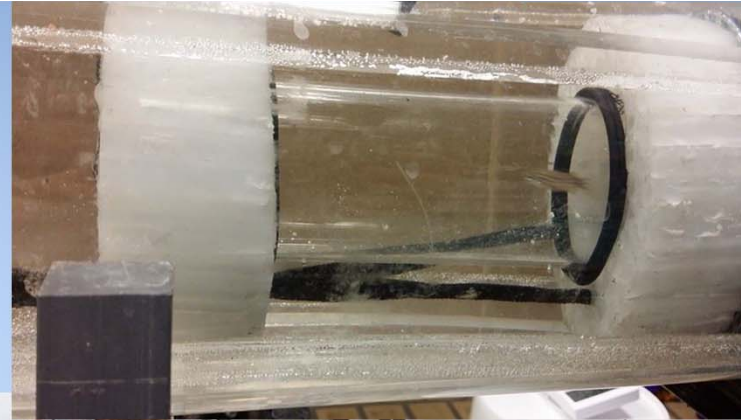


Tunnel without extension 60 Hz WIK:
<http://youtu.be/fxcEk9AIH1Y>

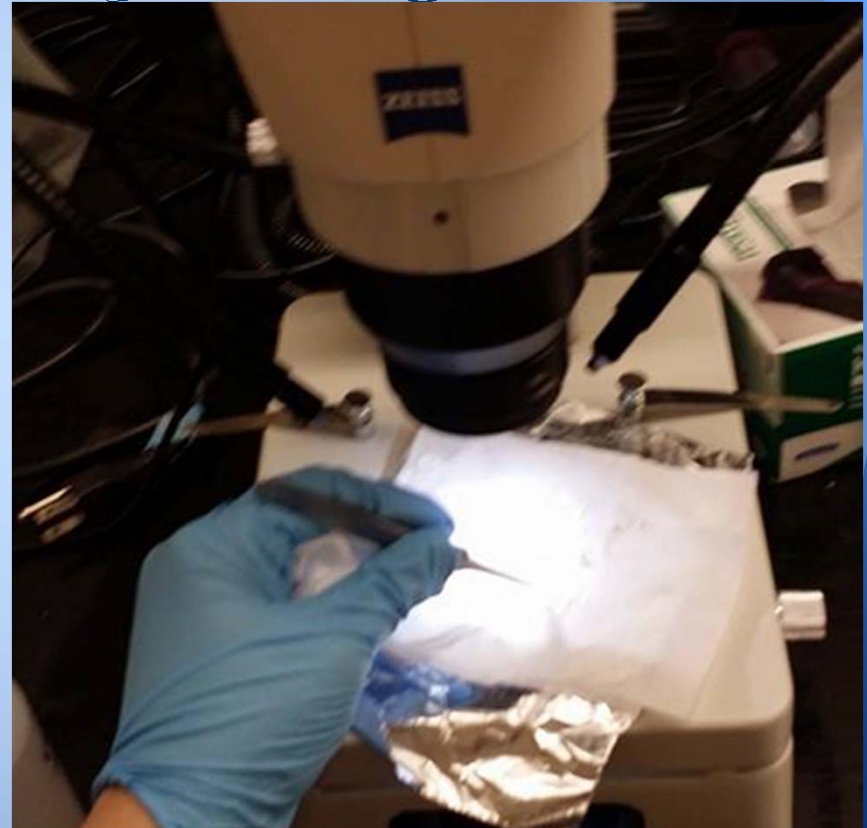
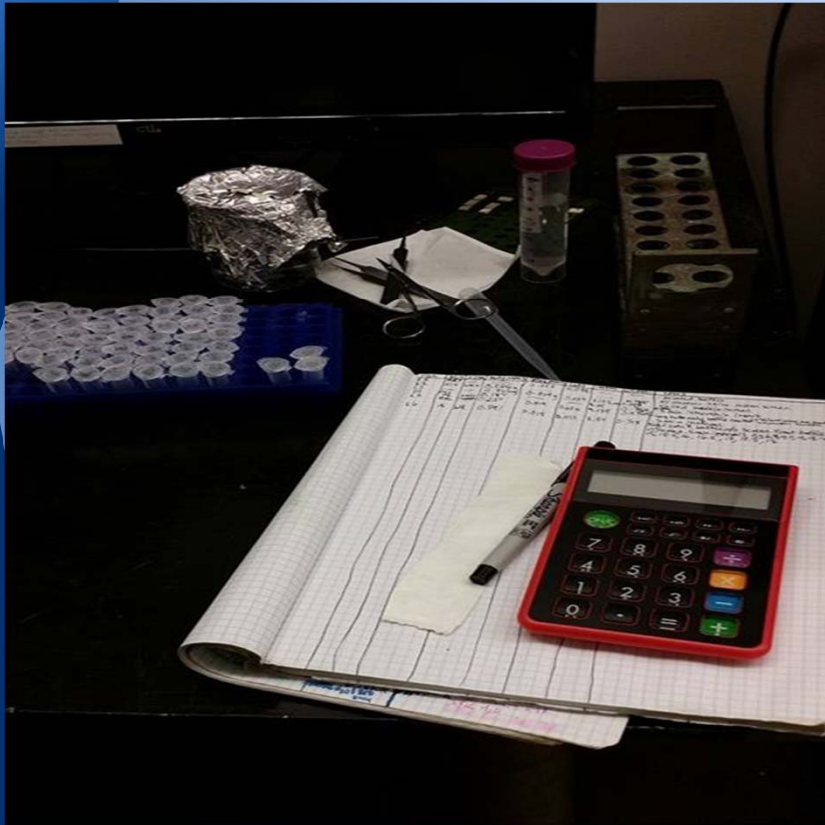
Modifications



Trials

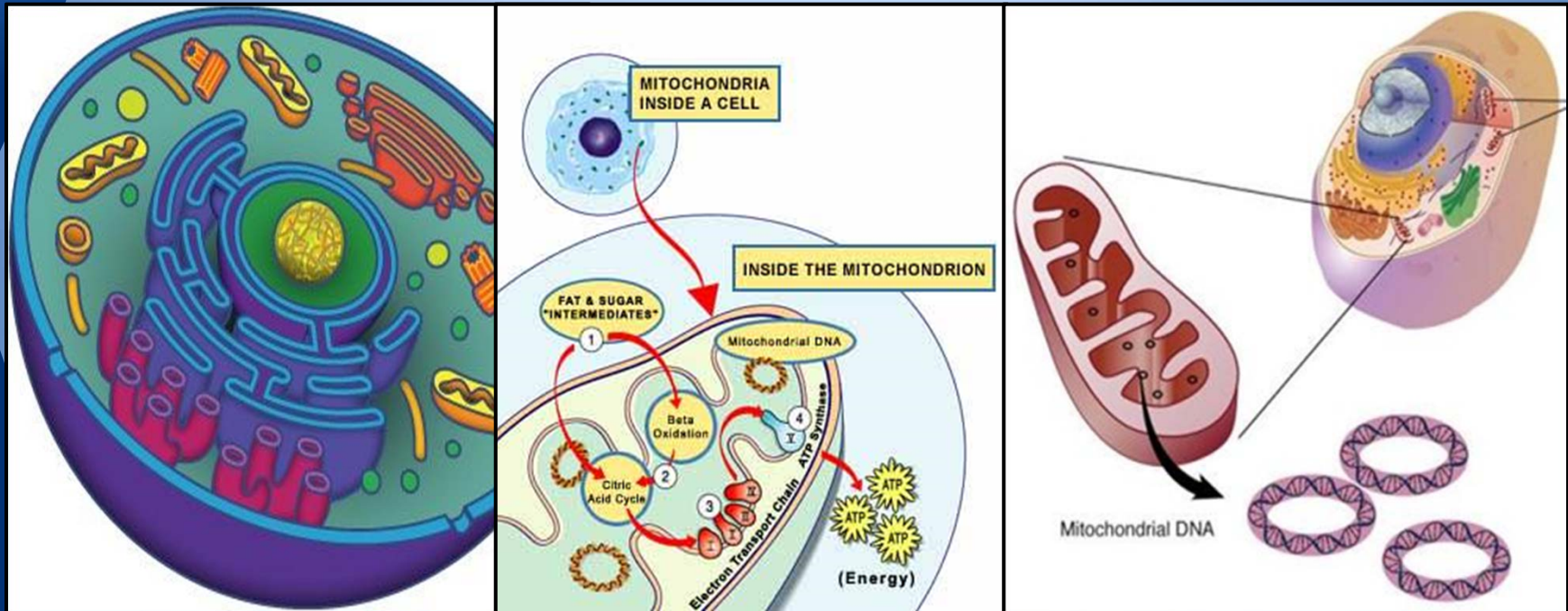


Dissections and Laboratory Testing



Mitochondria

Cell; Mitochondria; Mitochondrial DNA

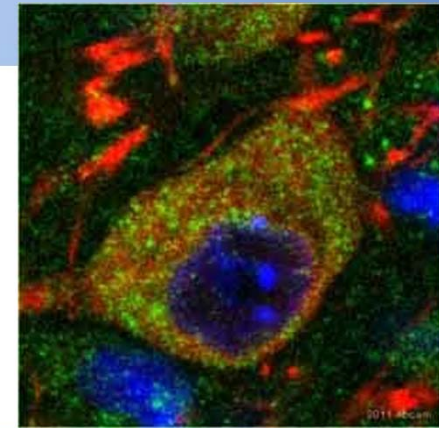


Mitochondrial Analysis



Mitochondrial DNA density in muscle tissue will be analyzed for individuals within each strain using quantitative PCR (qPCR).

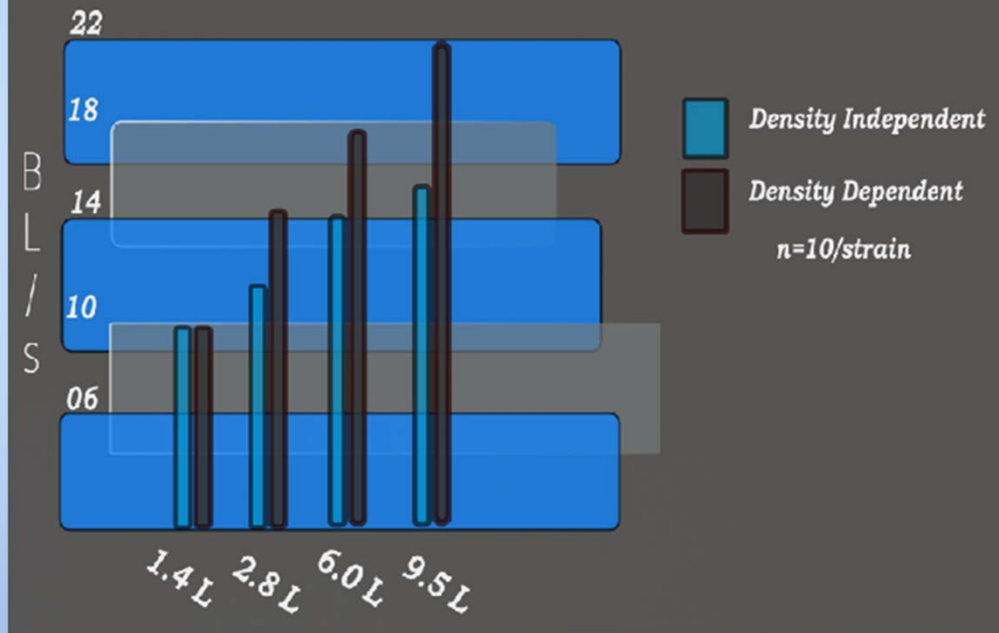
Mitochondria average size and organelle density will be analyzed using immunohistochemistry antigens and imaging with a fluorescence microscope.



What's Next?

- Test to see how Ucrit is affected by variable rearing conditions
 - Volumes and densities
 - Diets, including meat based, soy based (as a phytoestrogen), and regular plant based diets
 - Exposures
- Examine variance in mitochondrial density in different tissue types

Maximum Swim Speed (Ucrit) with Variable Densities



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