THE EFFECTS OF CREATINE SUPPLEMENTATION ON MUSCLE SYNTHESIS AND FITNESS LEVELS IN DROSOPHILA MELANOGASTER USING A MODEL OF MUSCLE ATROPHY

By Kevin Williams

RELEVANCE

Supplement Industry - $100+ Billion/ yr

Creatine - $450+ Million/ yr

Goal - Improve Livelihood

Current Studies on Muscle Atrophy

WHAT WILL BE TESTED?

HYPOTHESIS:

Creatine supplementation can increase the fitness of *Drosophila melanogaster* using a muscle atrophy model as proved by an increase in muscle size and exercise stamina when compared to a non-supplemented fly.

WHO AM I?

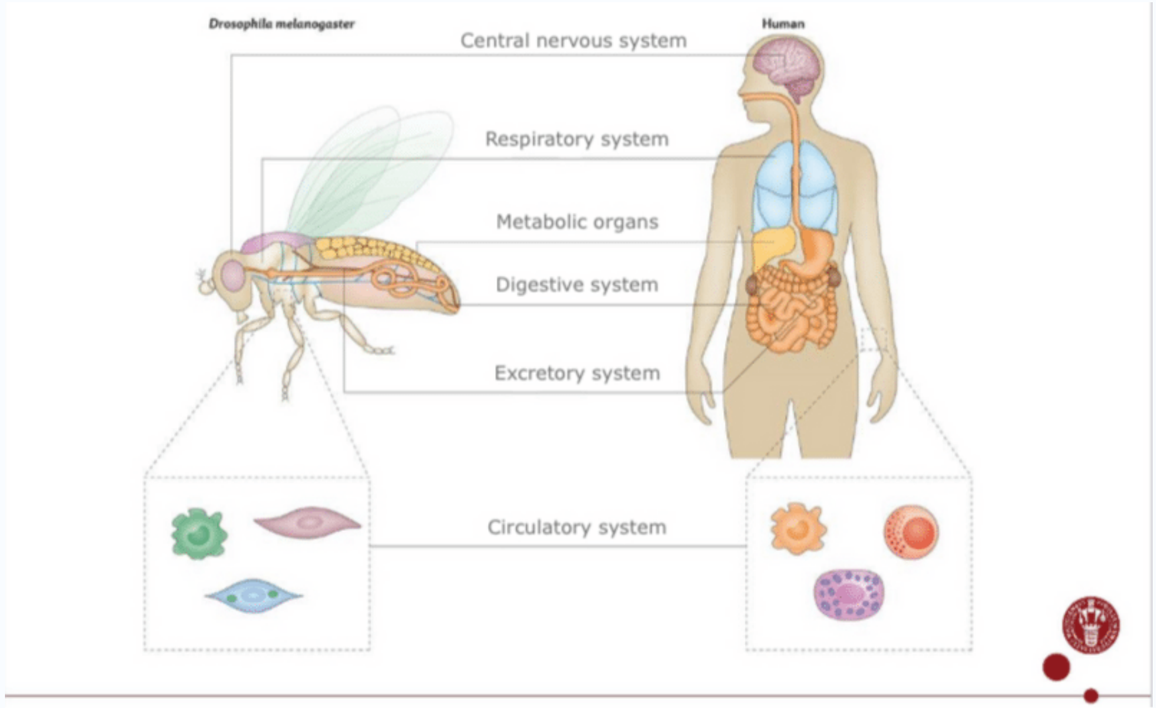
DROSOPHILA MELANOGASTER

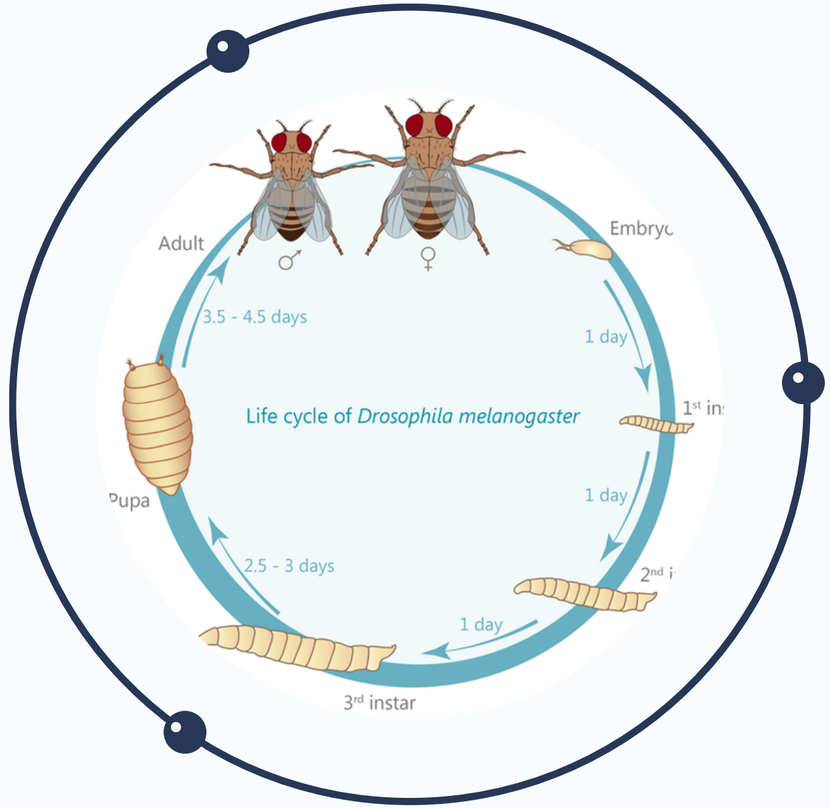
MODEL ORGANISM

Translate to humans

EASE OF CARE

Short life cycles

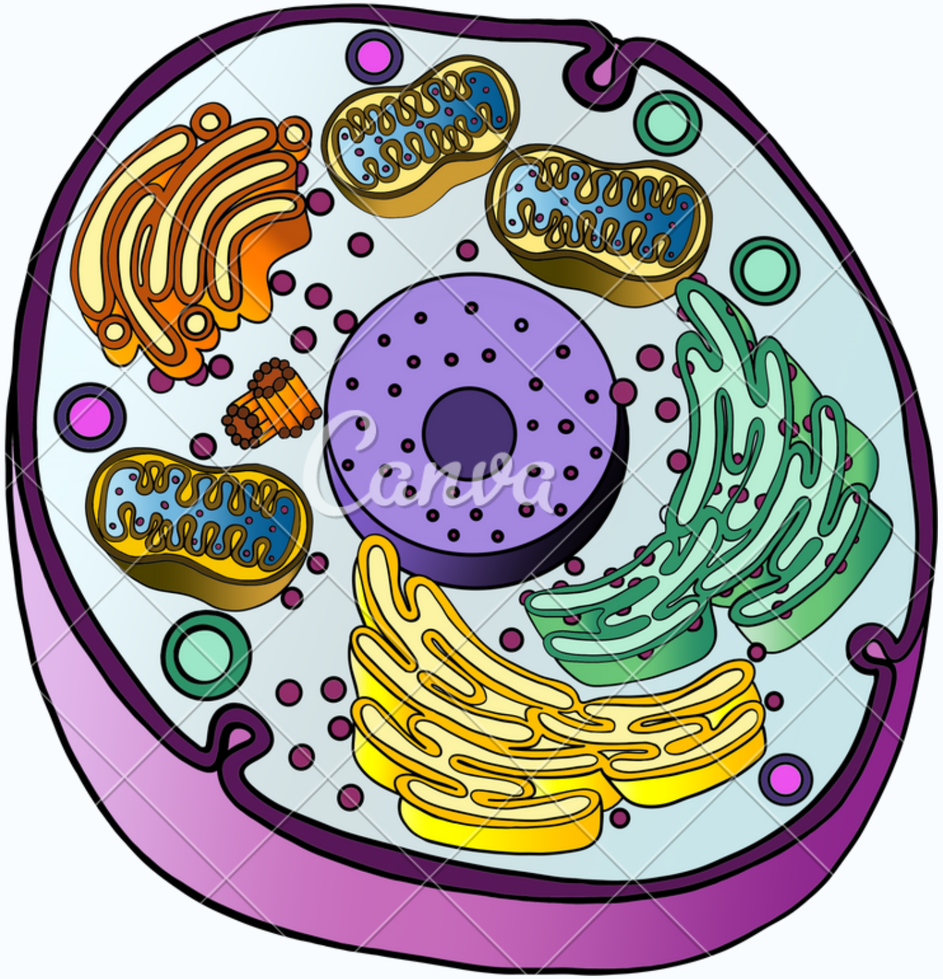




TESTING MECHANISM

Cell

- Many Organelles
- Functioning body
- Mitochondria



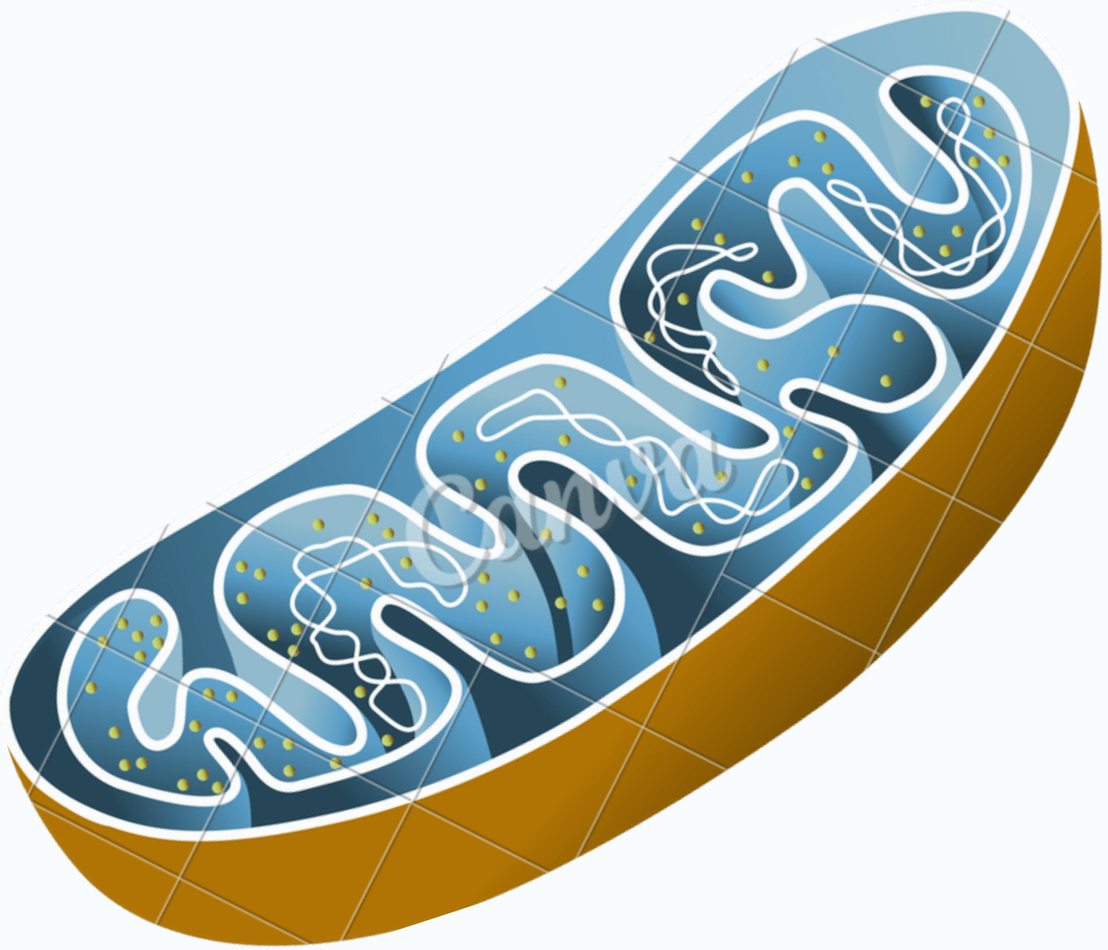
TESTING MECHANISM

Mitochondria

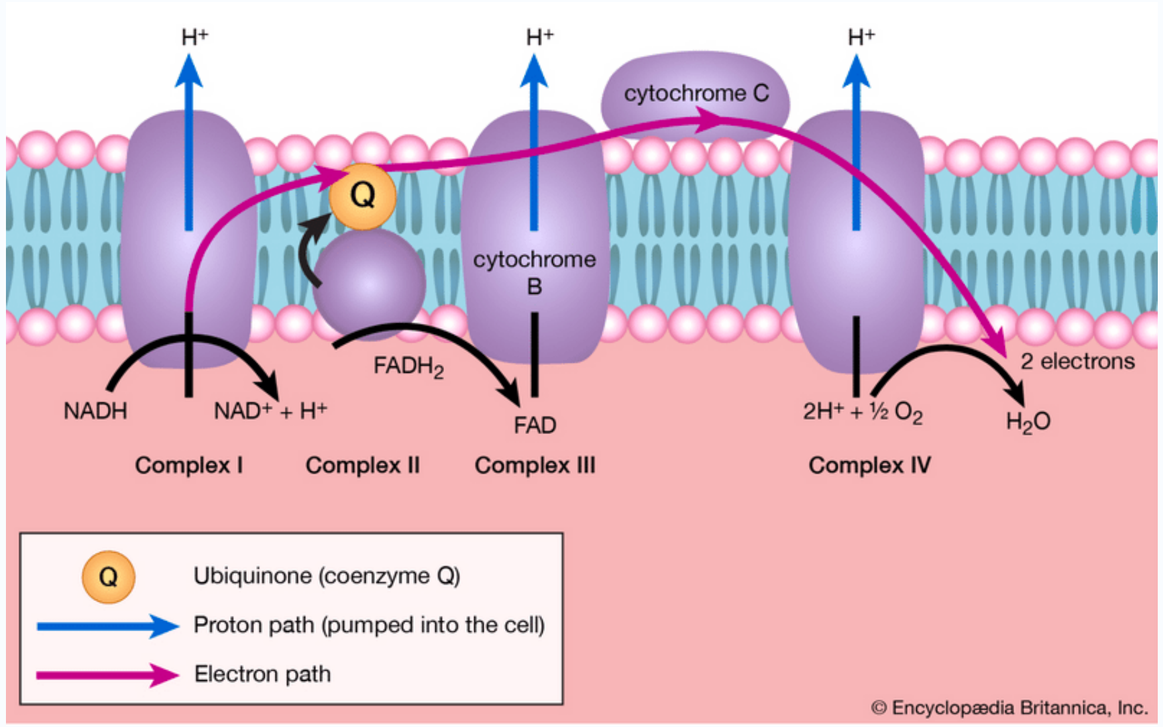
"Powerhouse" of the cell

Respiration and Energy production

Mechanisms to produce this energy



TESTING MECHANISM

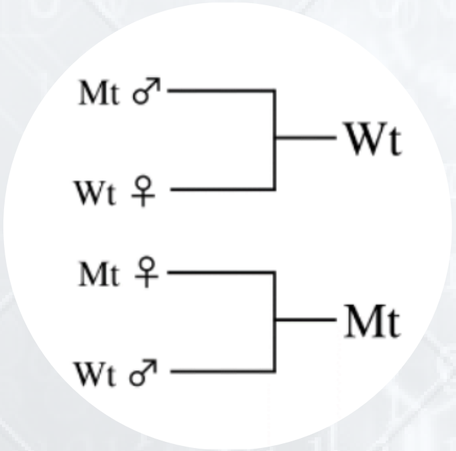


ELECTRON TRANSPORT CHAIN

An inhibited cytochrome oxidase

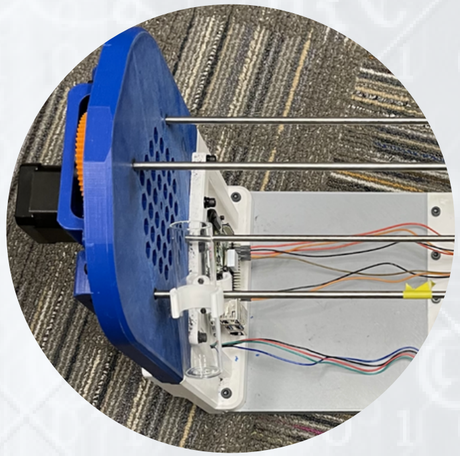
Phosphocreatine acts as a carrier for transferring energy from the mitochondria to the cytosol

METHODS



Cross

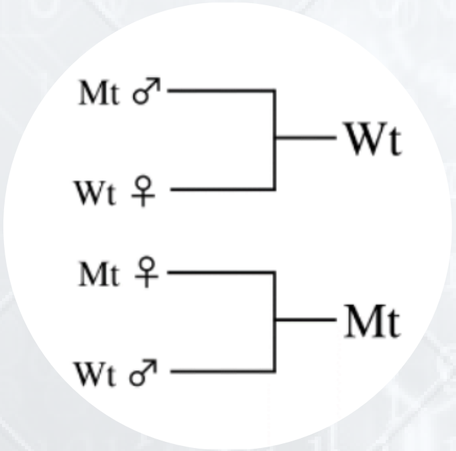
Measure Before



Supplement and Exercise

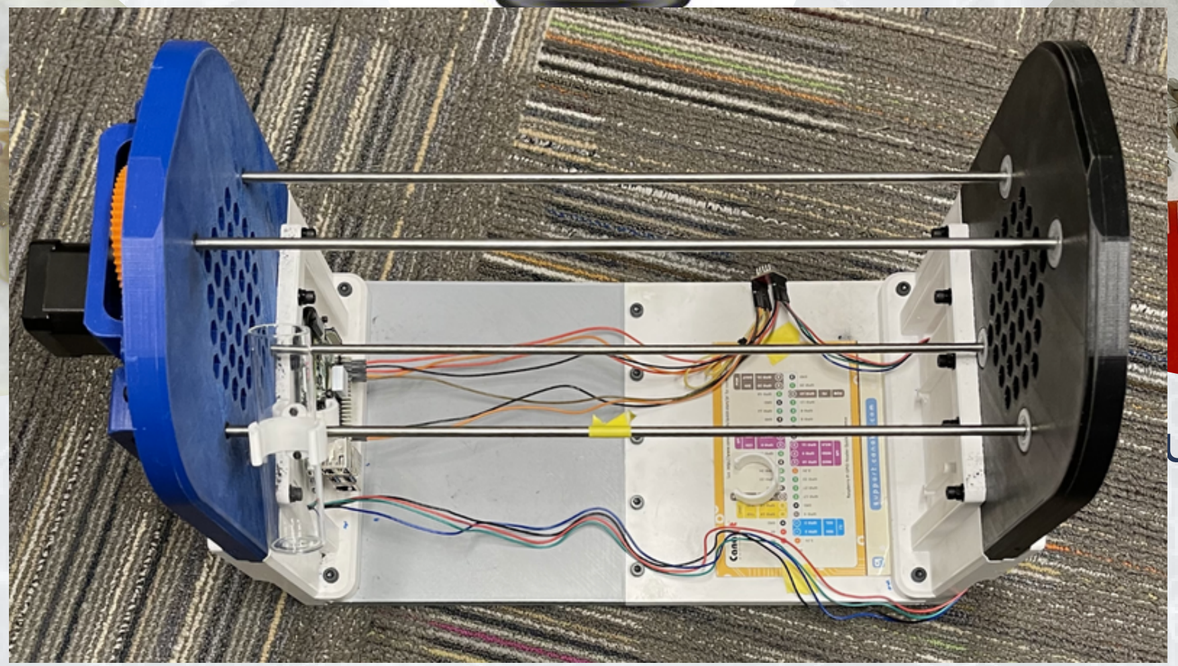
Measure After

METHODS



Cross

Measure



Supplement and Exercise

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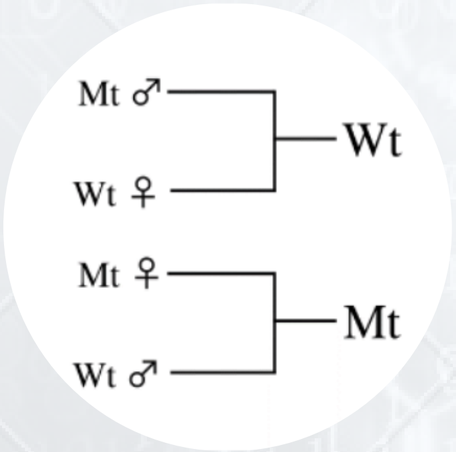
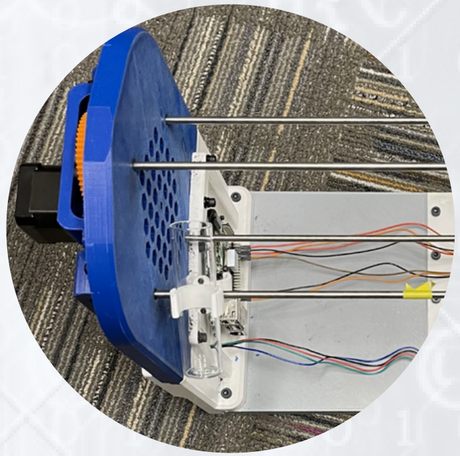
METHODS



Cross

Measure Before



Supplement and Exercise

Measure After

RESULTS

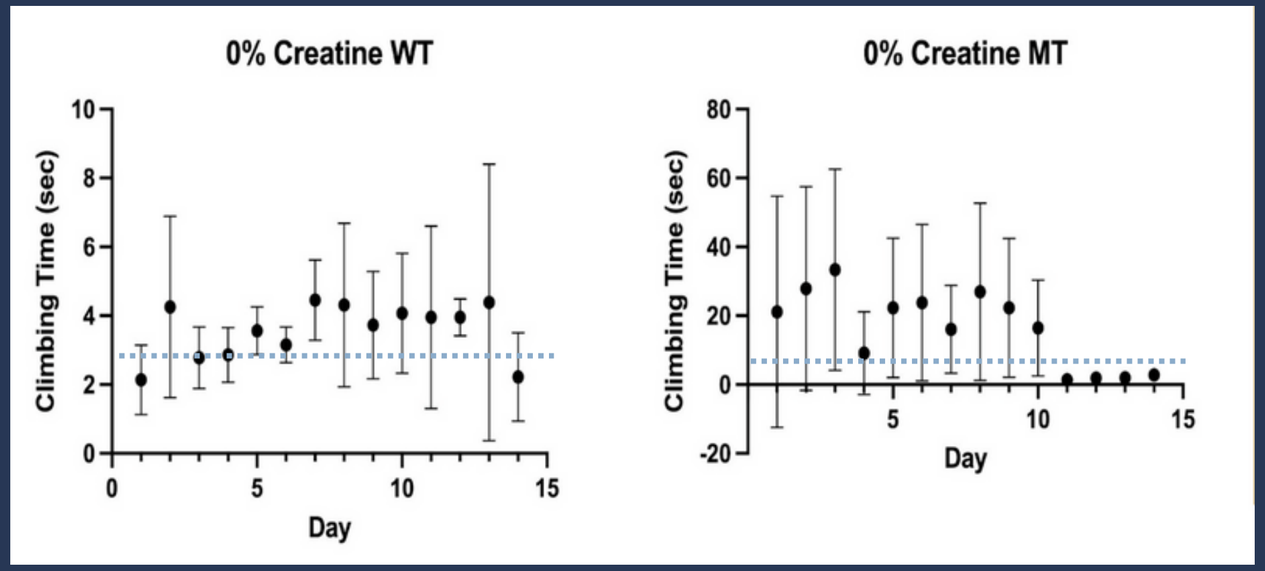
CLIMBING TIME

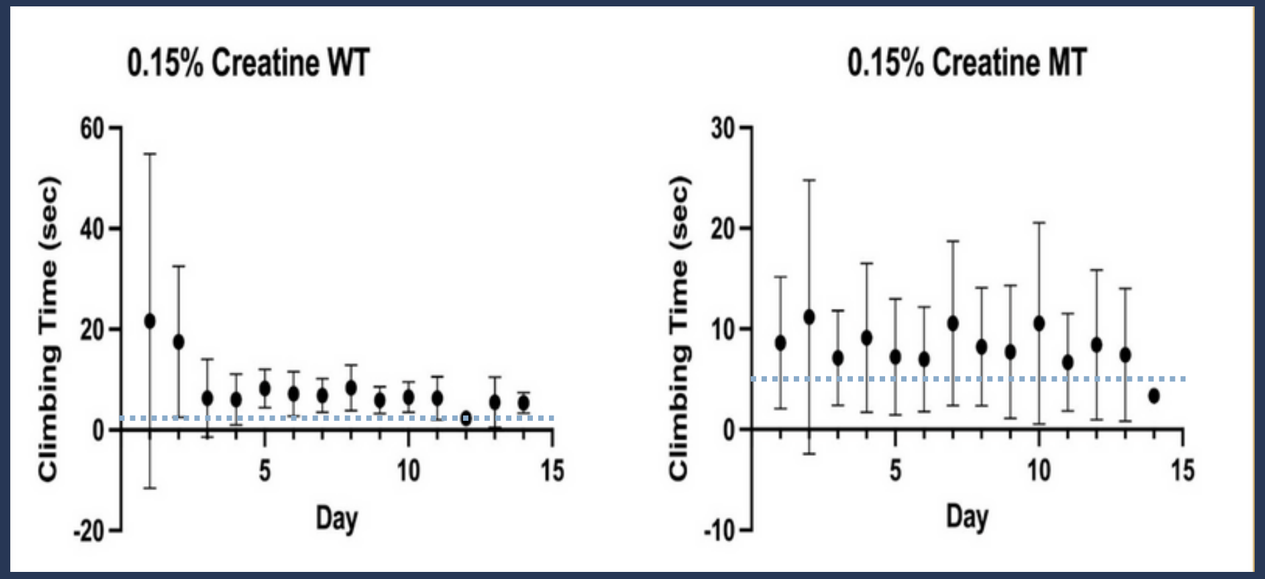
WILD TYPE (WT)

Increase with addition of creatine

MUTANT (MT)

Decrease with addition of creatine





RESULTS

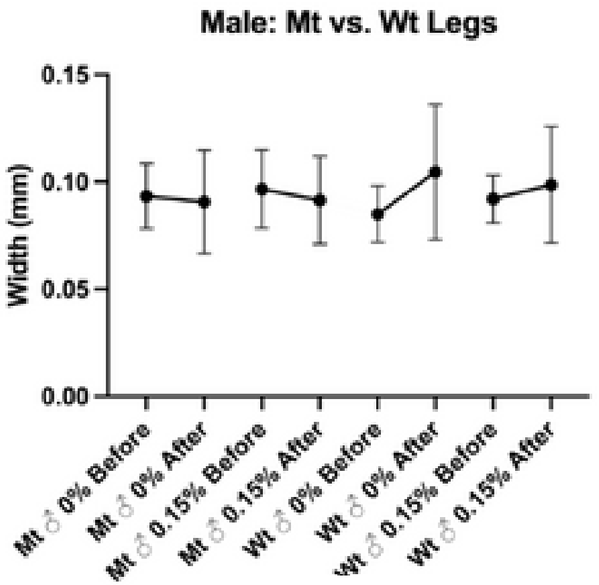
LEG WIDTH

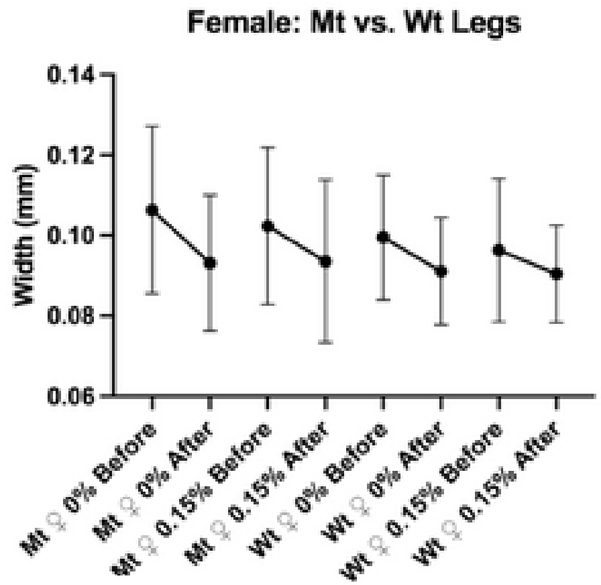
WILD TYPE (WT)

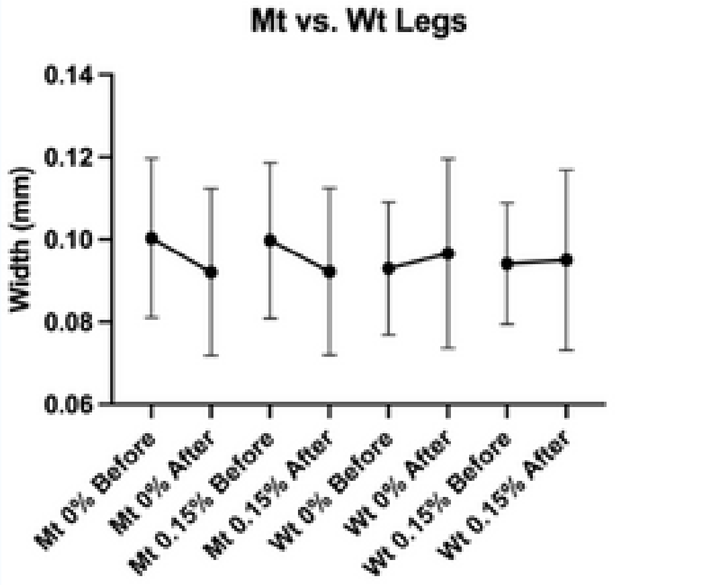
Less of a decrease

MUTANT (MT)

More of a decrease

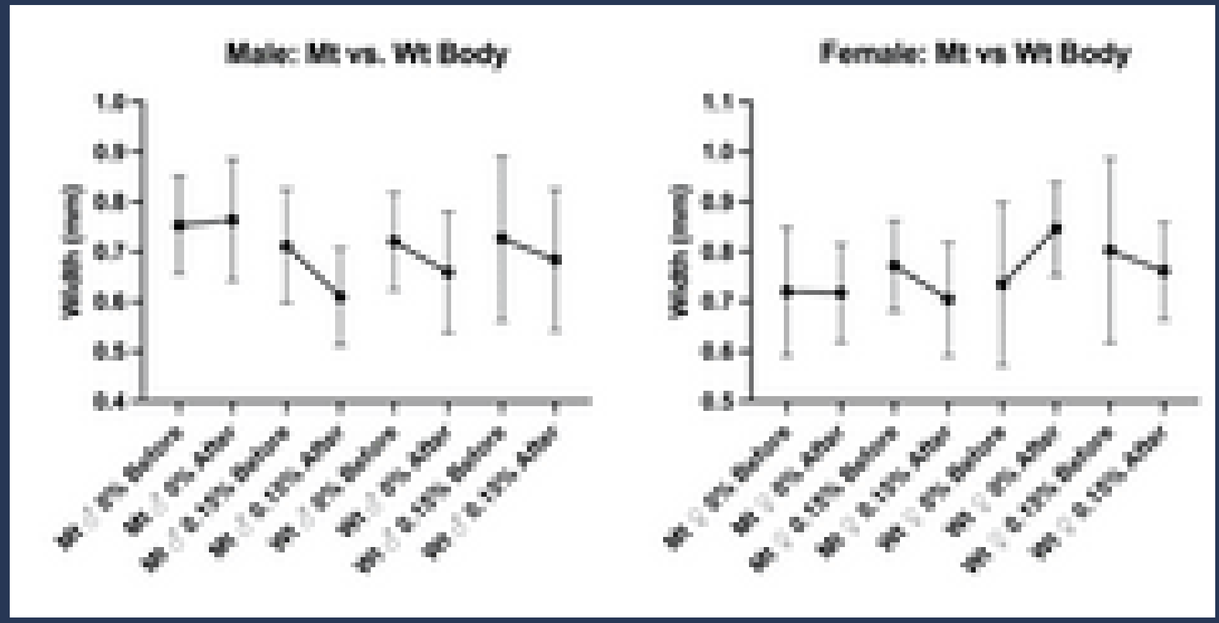


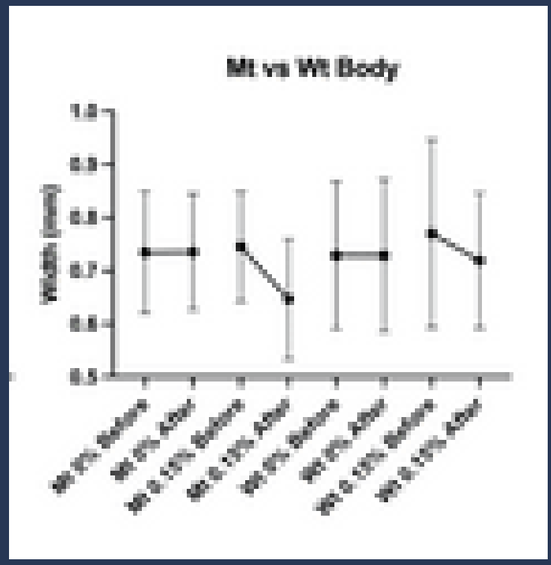




RESULTS

BODY WIDTH





WILD TYPE (WT)

Decrease slightly more with 0.15%

MUTANT (MT)

Decrease with 0.15%

INCONCLUSIVE

DATA IS LARGELY STATISTICALLY INSIGNIFICANT

FUTURE STUDIES

Additions/Changes

Better camera

More trials

More flies per trial

RNA Expression

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