The Effects of Aluminum Exposure on Planarian Photophobic Response to Different Wavelengths of Light

By Anden Velez

Aluminum (Al)

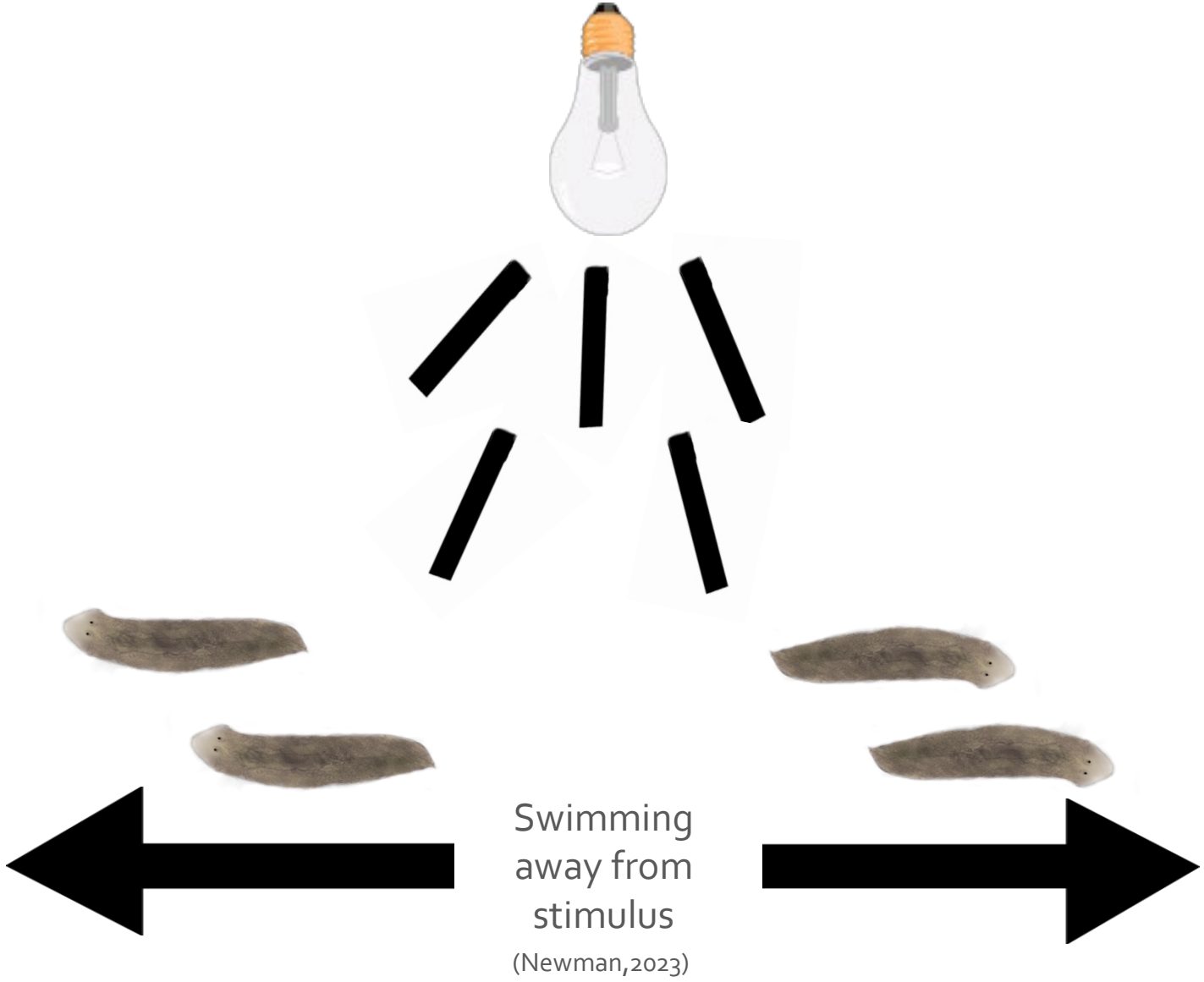
- One of the most common metals
- The ATSDR considers aluminum relatively harmless , but toxicity does occur when there is high levels in the human body
- Found in personal care products
- The health effects of aluminum
  - Bone
  - Alzheimer's disease
  - Parkinson's disease

Planarian Flatworms

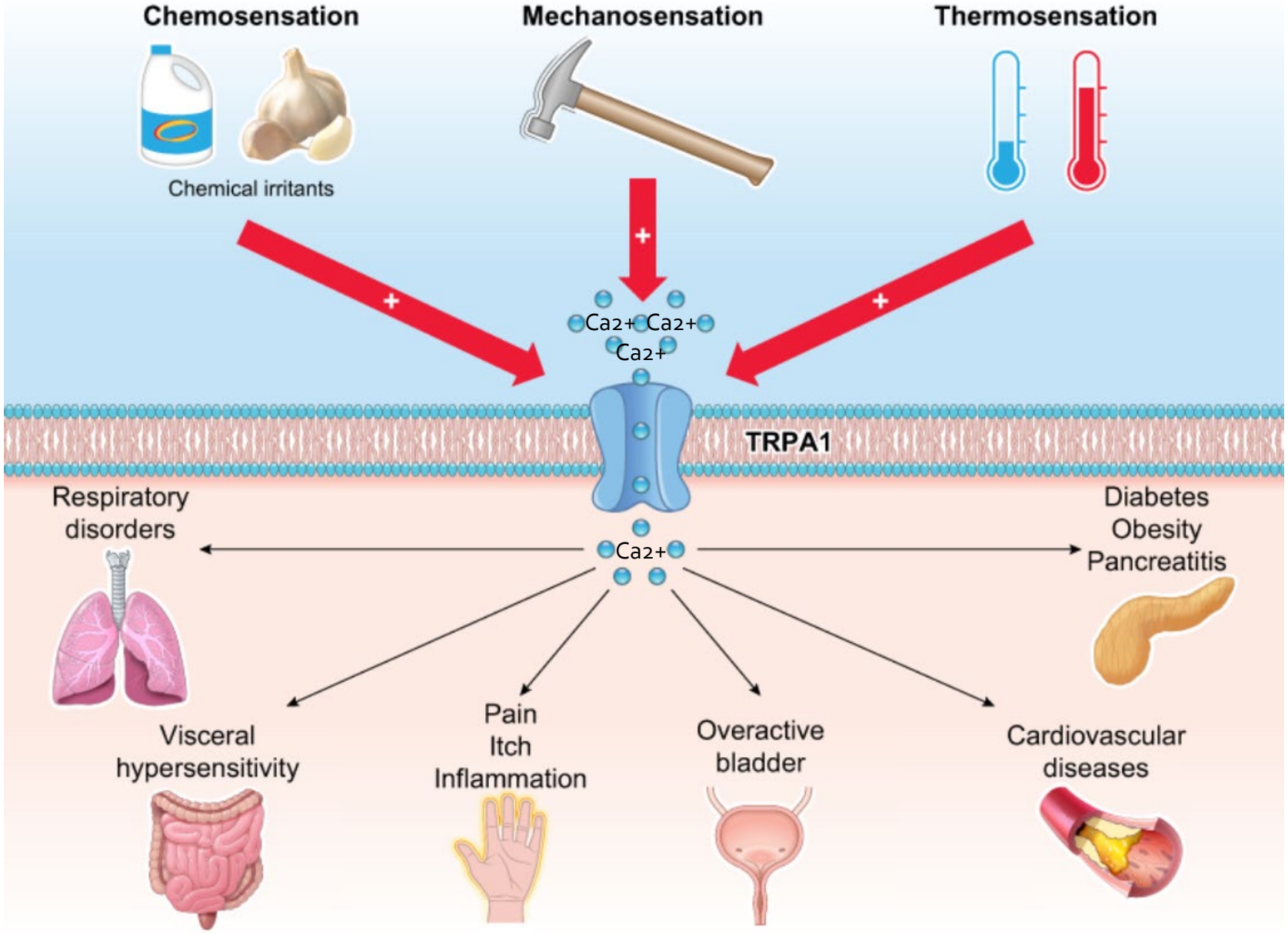
(Emmons-Bell et al., 2015)

- What are planarians?
- Why use planarians?
- The planarian and human nervous systems

Planarian Photophobic Response



Transient Receptor Potential Ankyrin 1 (TRPA1)



(Talavera et al., 2020)

What We Know

- Few studies have been done on planarian photophobia and to our knowledge no studies have looked at aluminum exposures affects photophobic behaviors

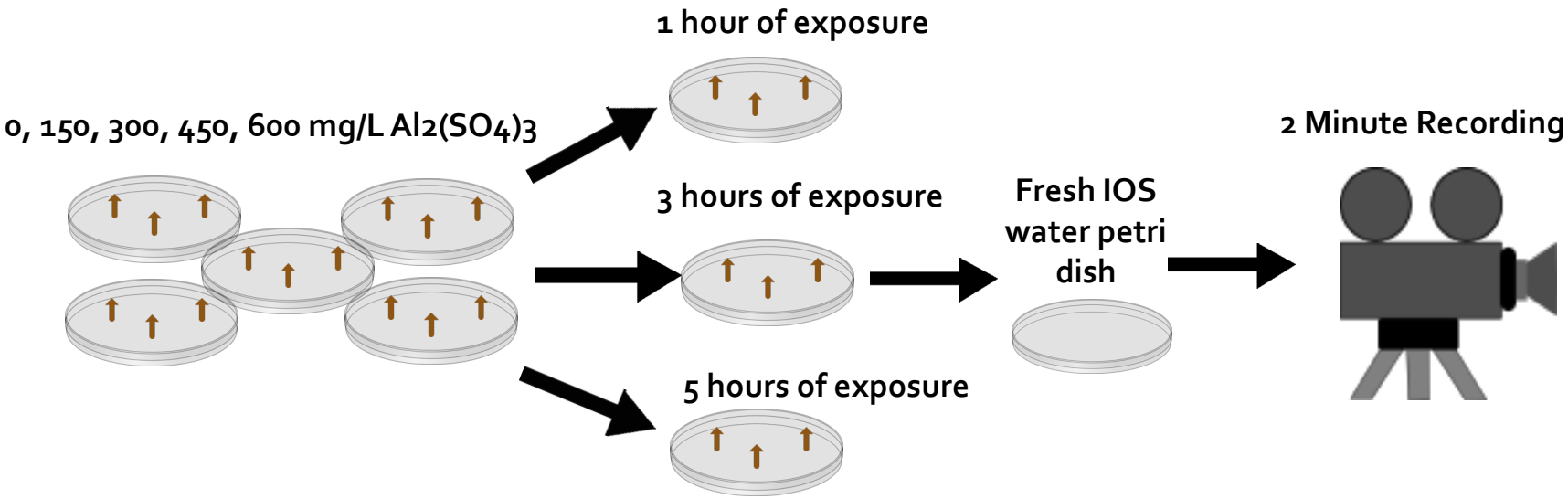
Research Question

- What effects does aluminum have on photophobic behavior?

Research Hypothesis

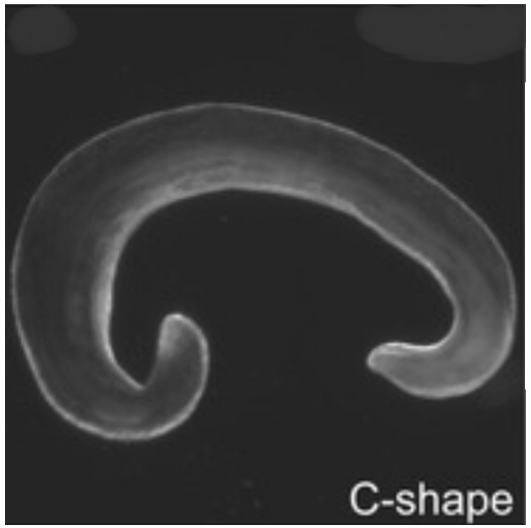
- Aluminum exposure amplifies their photophobic behavior

Planarian Reference Dosage for Aluminum

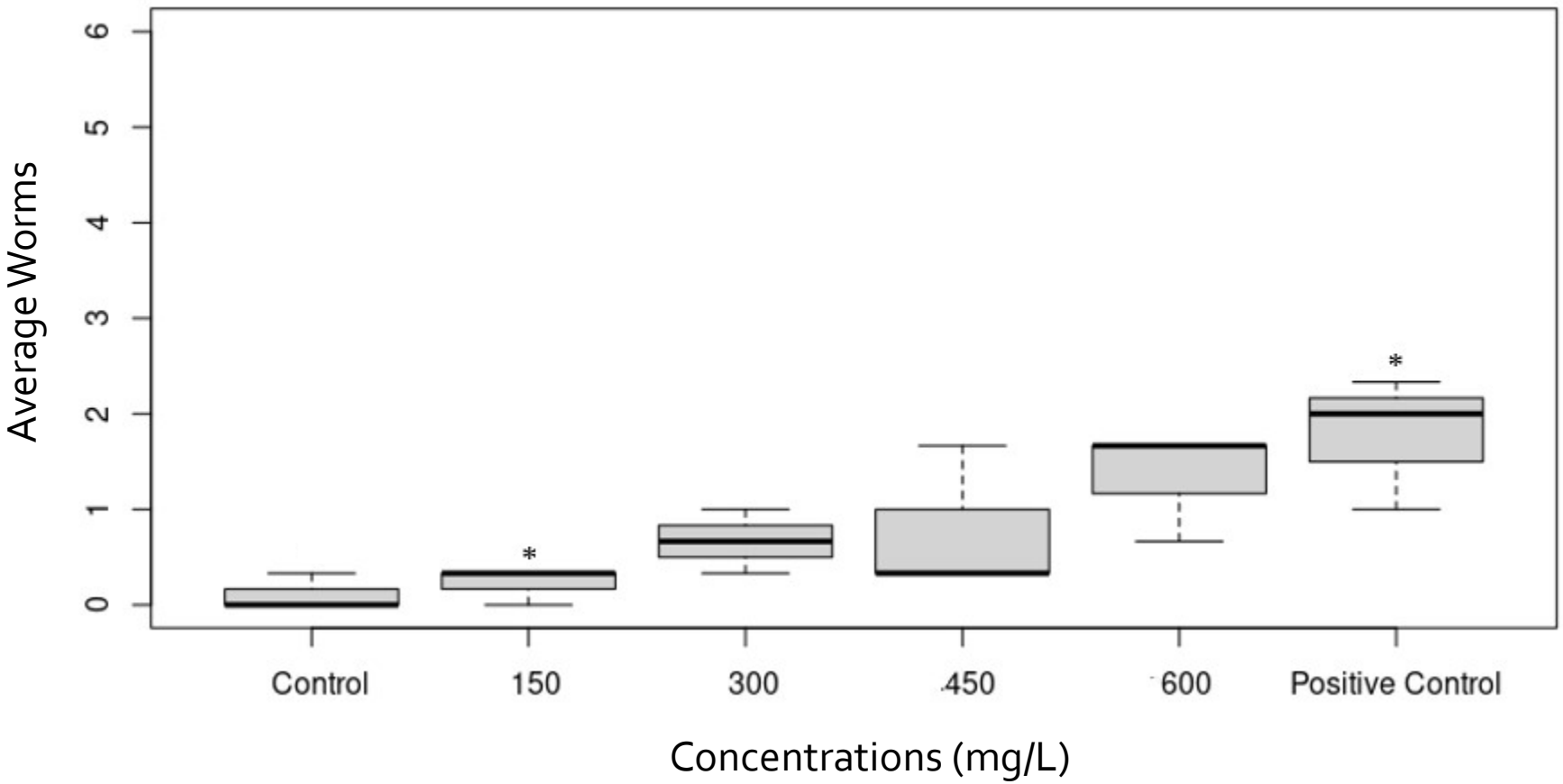


(Kim et al., 2021)

5 Hour Exposure

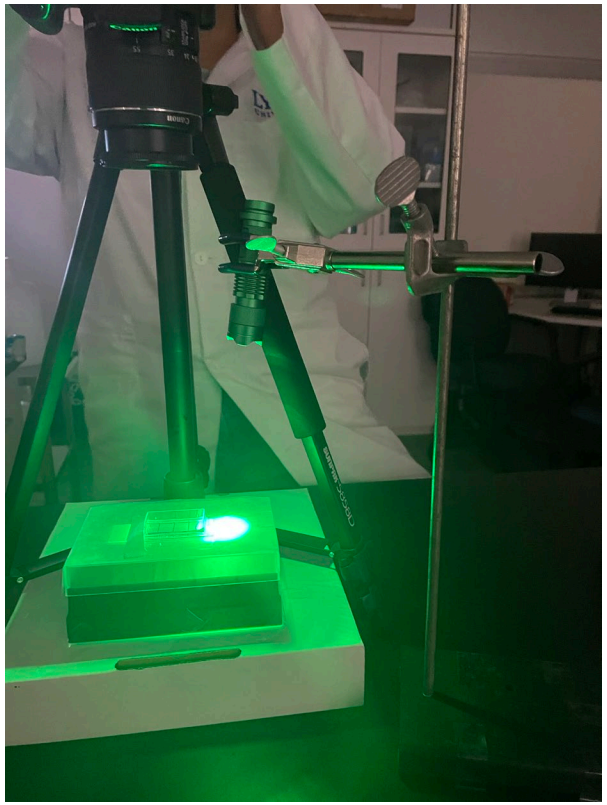


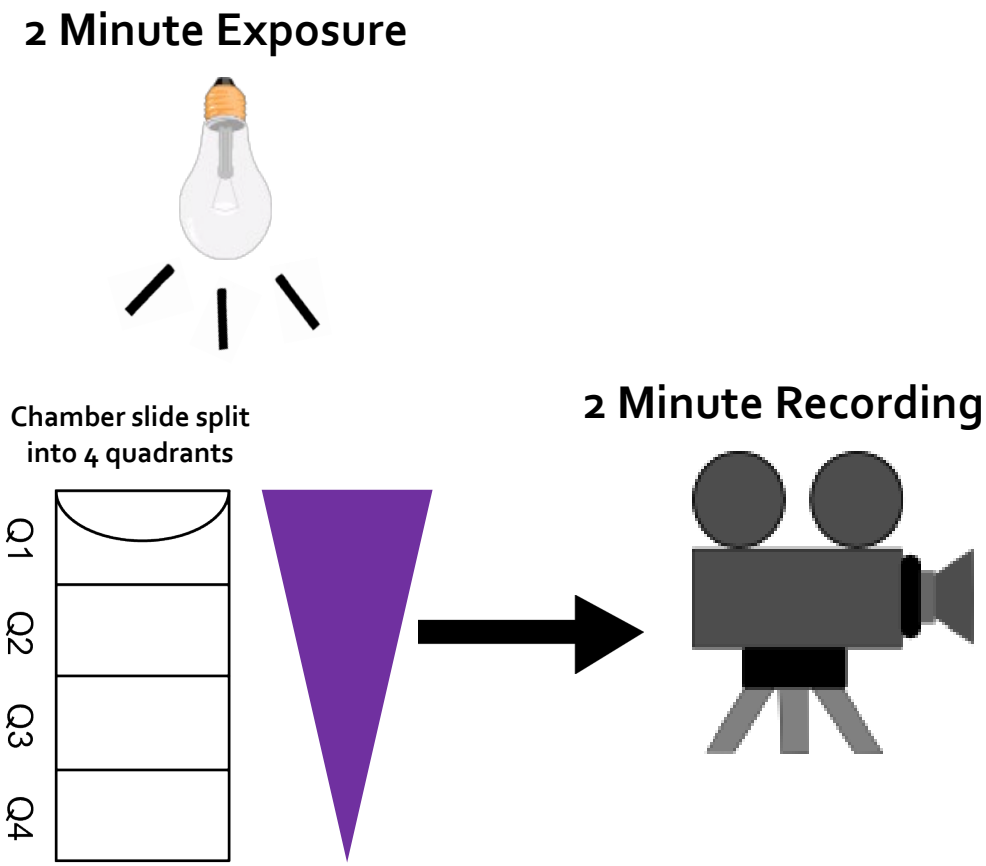
(Hagstrom et al., 2016)

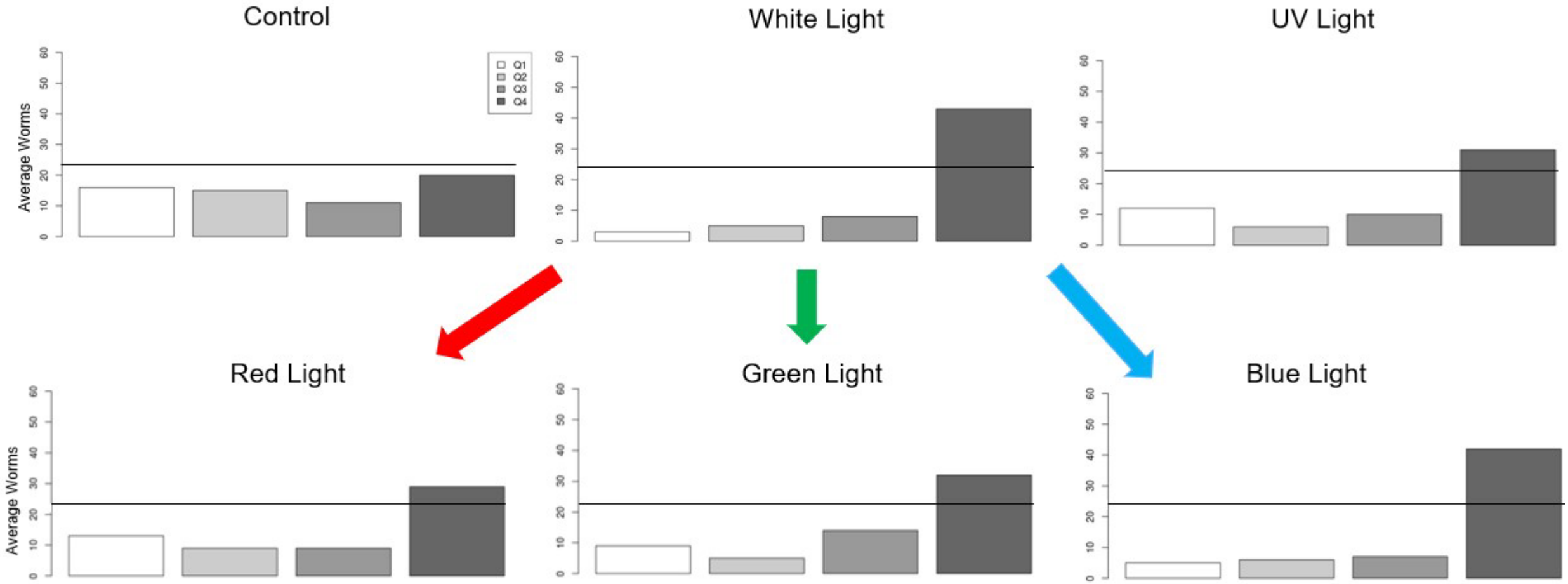


One Way ANOVA: P-value>0.05 N=18 per group

Planarian Phototaxis Responses to Varying Wavelengths of Light

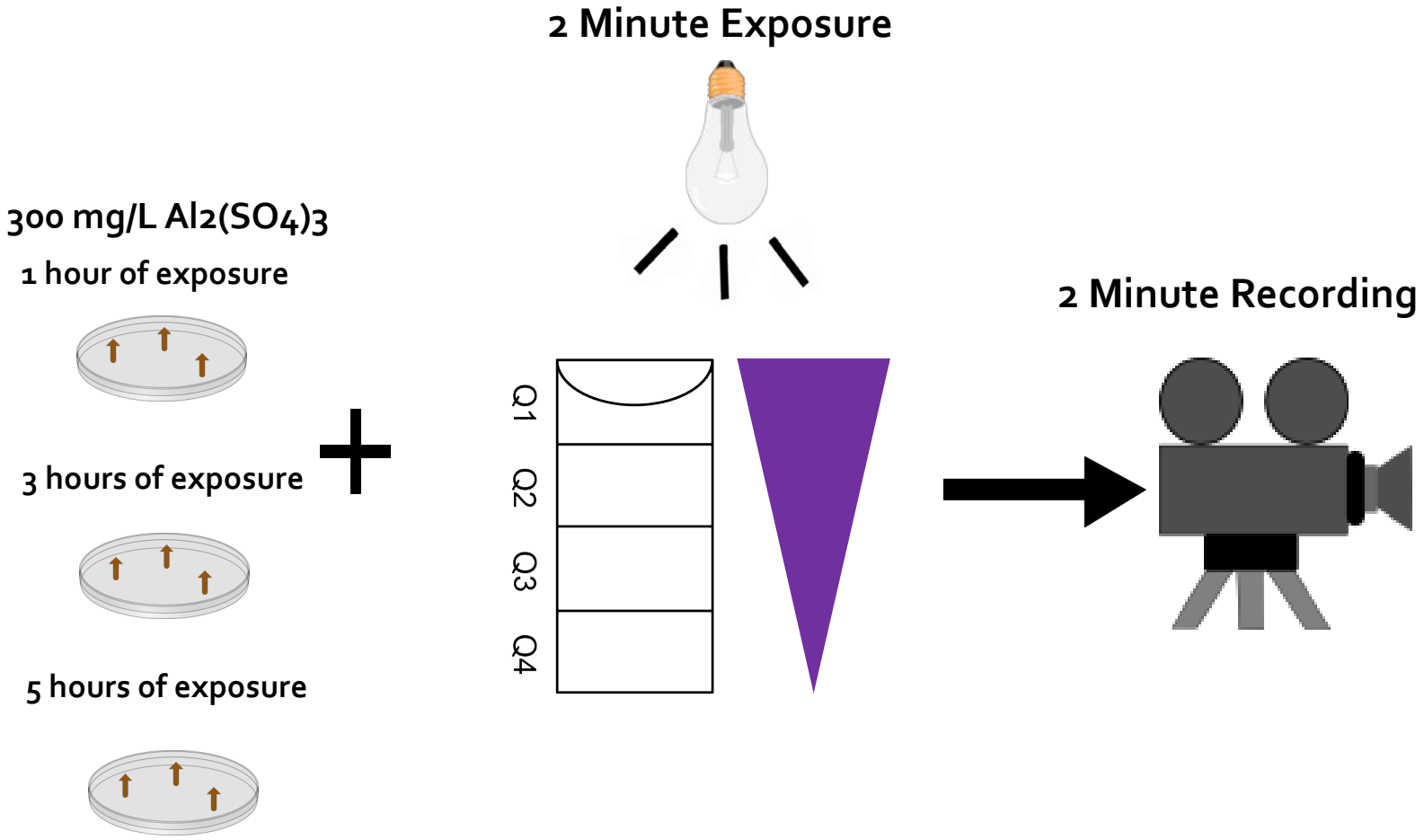


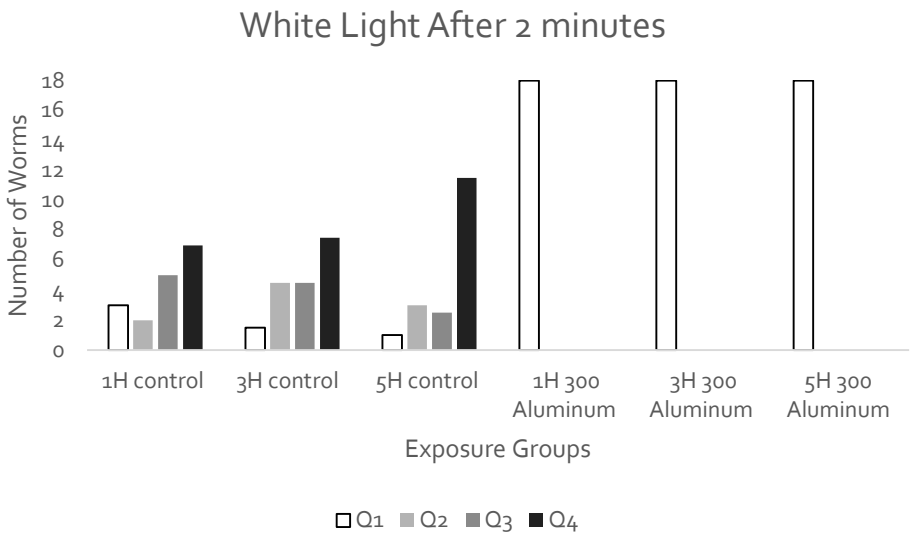


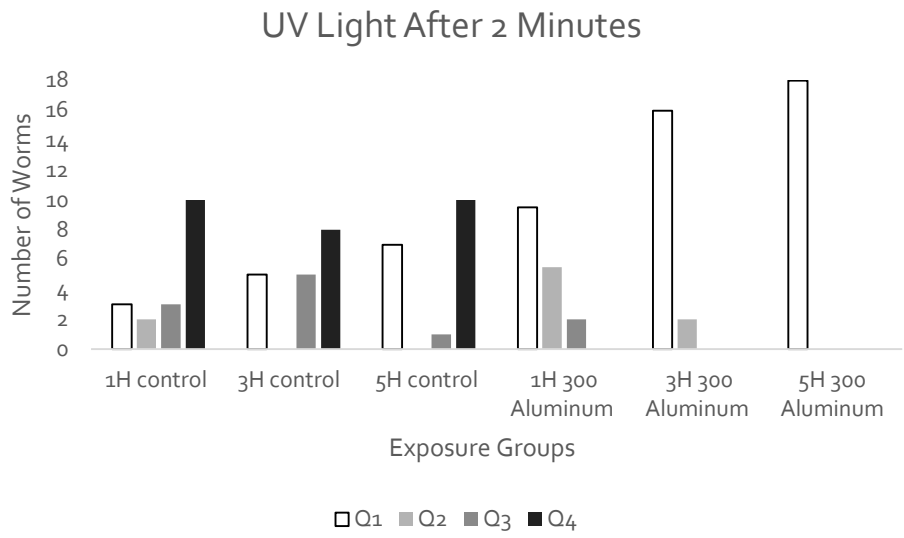


Multinomial : P-value= 0.001 N= 60

Aluminum Effects on Planarian Adverse Phototaxis Reaction to Different Wavelengths of Light







- Aluminum exposed planarians did not leave quadrant 1 under white light
- Very few worms left quadrant 1 when under UV exposure

What Does This Mean?

- The worms did not have an increase in photophobic behavior
- The results did not support the hypothesis that aluminum exposure will increase photophobic behavior
- Their motility was possibly inhibited by the aluminum exposure
- Future experiments potentially is directly testing TRPA1

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