

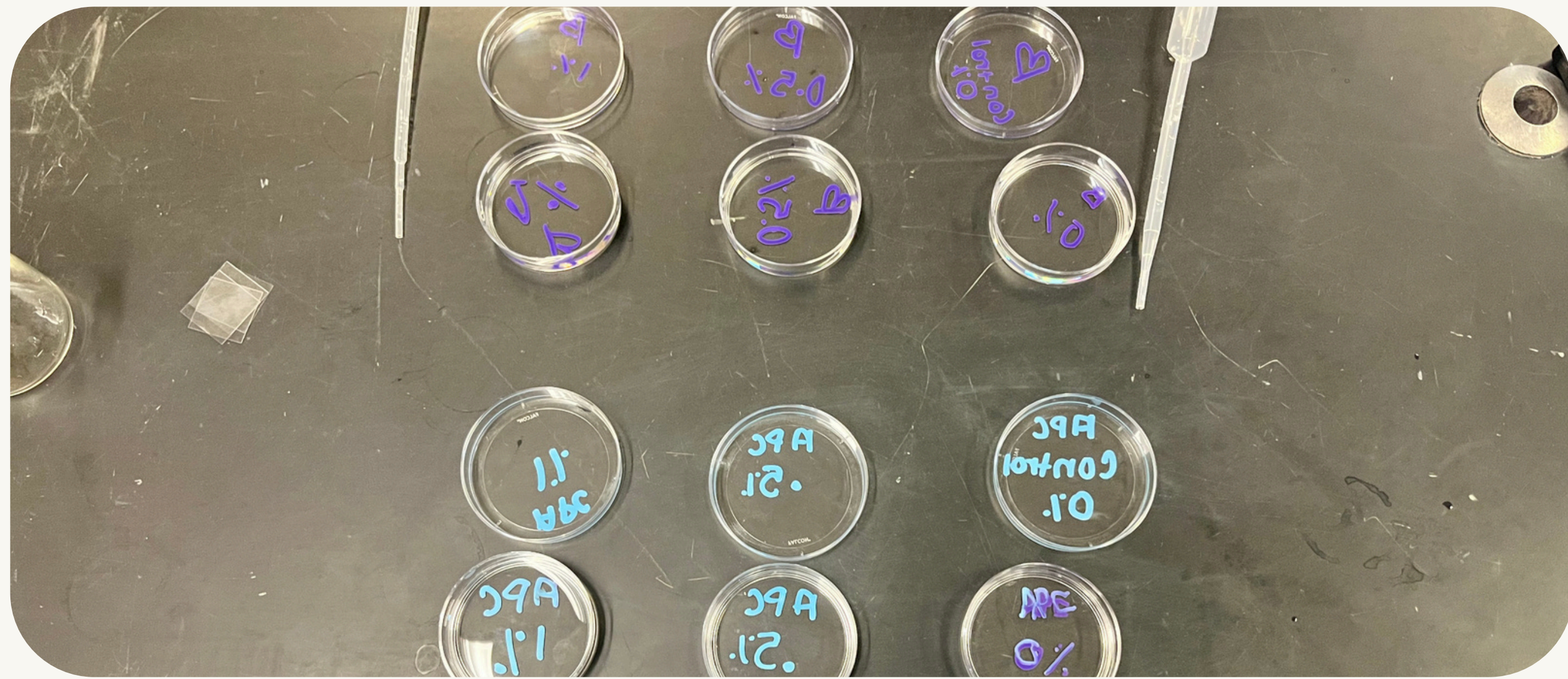


The Effect of Glucose on the Regeneration Rate of APC RNAi & B-CAT RNAi Planarians



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01. Abstract (Aniya)



This experiment aimed to compare different glucose levels and the regeneration rate of two planarian types. 21 Planarians, 9 APC RNAi planarians, 9 B-catenin RNAi planarians, and 3 non-genetically modified planarians were divided into 7 Petri dishes with varying levels of glucose (including 0%, 0.5%, and 1%), then cut in half. The results showed that the regeneration rate was unaffected or slowed down. Our hypothesis was disproven.

02. Introduction (Zainab)

This experiment investigated how glucose concentration affects the regeneration rate of planaria treated with APC RNAi and B-catenin RNAi. APC RNAi planarians grow a secondary head when cut and regenerated. B-catenin RNAi planarians grow a secondary tail when cut and regenerated. The objective was to compare regeneration rates between the two RNAi treatments under varying glucose levels. We hypothesized that increased glucose concentrations would increase the regeneration rate in both RNAi-treated groups.

06. Literature Cited (Sophia)

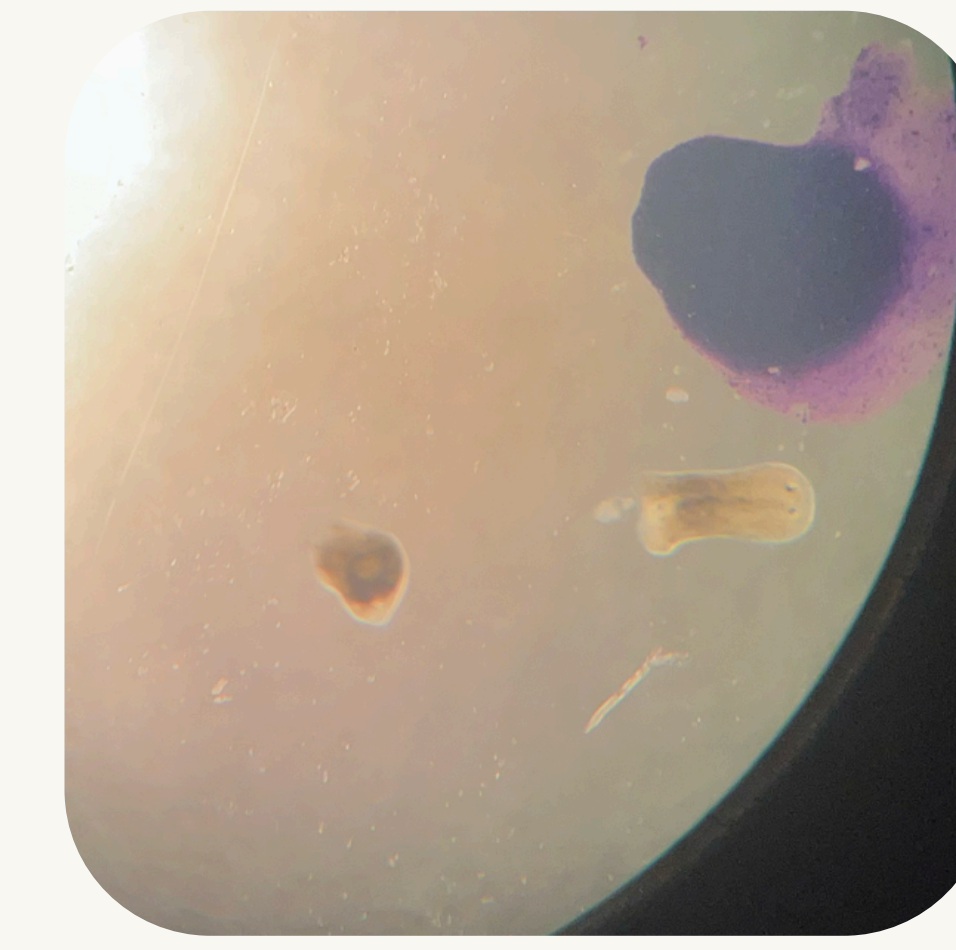
Osuma, E. A., Riggs, D. W., Gibb, A. A., & Hill, B. G. (2018). High throughput measurement of metabolism in planarians reveals activation of glycolysis during regeneration. *Regeneration*, 5(1), 78–86. <https://doi.org/10.1002/reg2.95>

03. Methodology (Aniya)

To conduct our experiment, the materials required were 21 planarians, Planarian water, 7 petri dishes, 3 pipettes, 3 microscope slides, 0% level glucose, 0.5% level glucose, and 1% level glucose.

Procedure:

1. We filled 1 Petri dish with our control solution, which consisted of planarian water with 1% glucose and non-genetically modified planarians.
2. We filled 3 more Petri dishes with 0% glucose, the second had 0.5% glucose, and the third had 1% glucose. 3 APC RNAi planarians were added to each dish.
3. With 3 additional Petri dishes, the same steps as step 2 were performed, but with B-catenin RNAi planarians instead.
4. Every planarian in all dishes was cut in half with a microscope slide.
5. Each Petri dish was covered with its respective lid and covered with a paper towel
6. Growth results were collected over three observation periods on days 1, 4, and 7.



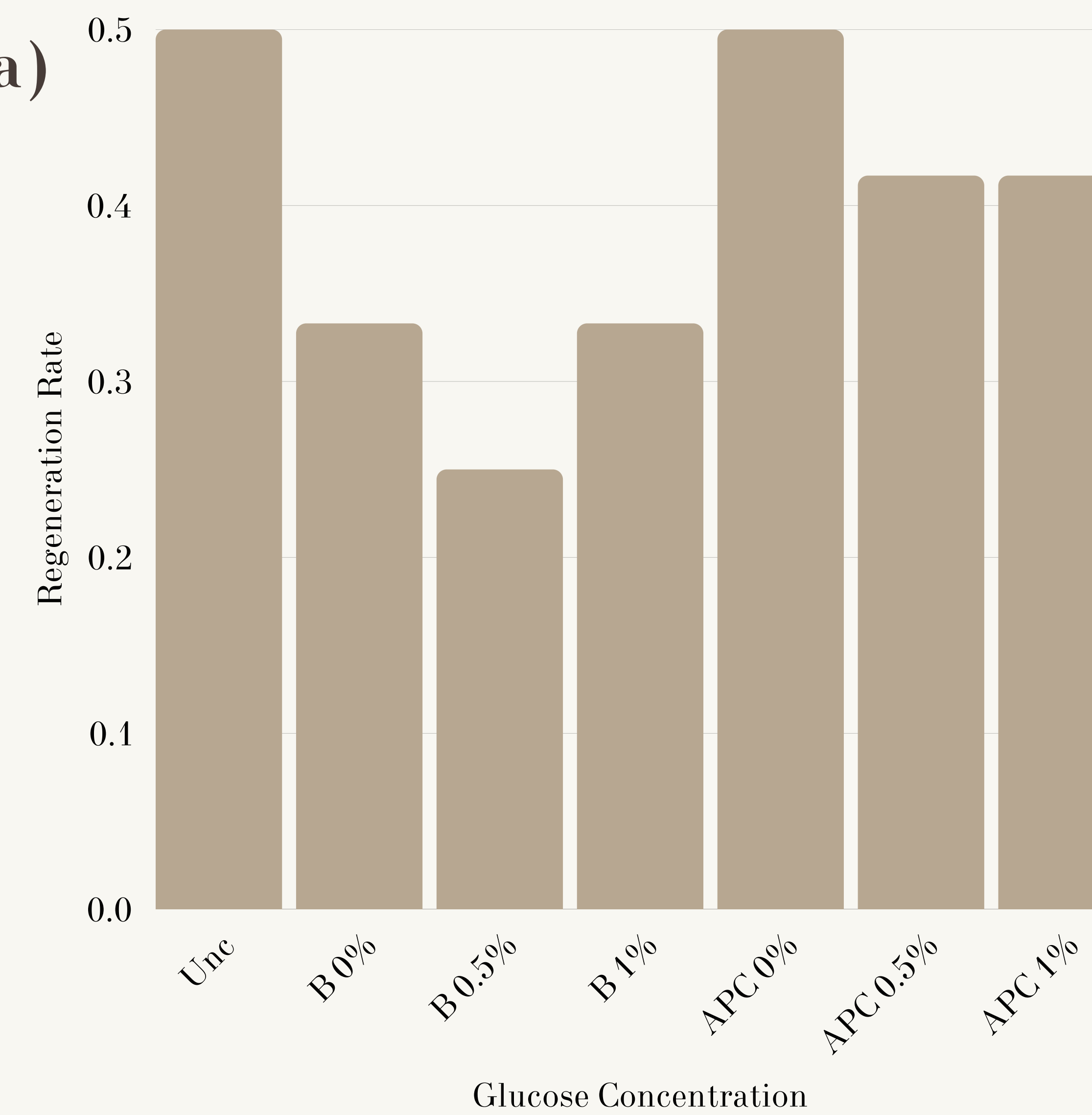
04. Results (Sophia)

Our results showed that as glucose concentration increased, the regeneration rate either stayed the same or decreased.

Chi Square = 0.130145

Critical Value - 12.59

We failed to reject our null hypothesis, meaning there is not enough evidence to support our alternative hypothesis.



05. Discussion (Dipsika)

Our results show that as glucose concentration increased, the regeneration rate of RNAi-treated planaria generally decreased or stayed the same. The B 0.5% glucose group had the slowest regeneration rate, while the APC 0% had the fastest. Although this trend supported our hypothesis that higher glucose levels would slow the regeneration rate, the results were not statistically significant (Chi Square = 0.130145, Critical Value = 12.59). This suggests that excess glucose could impair regeneration, possibly by disrupting metabolic processes already affected by RNAi treatment inconsistencies, which may have resulted from experimental errors such as differences in how the planaria were cut or outside factors. For future studies, we would increase the sample size, test more glucose concentrations, and monitor metabolic activity to better understand glucose's role in regeneration.