Supplementation of Retinoic Acid on the Regeneration Rate of Dugesia tigrina

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Planaria are well known for their phenomenal regeneration abilities. Because of the presence of totipotent stem cells (also known as neoblasts) throughout their body, they are commonly used in research as a foundation for understanding regeneration. Retinoic acid, a derivative of Vitamin A, plays a role in cell growth and differentiation. With this is mind, this experiment involved testing all-trans-retinoic acid to 20 Dugesia tigrina (brown planaria) out of a total of 40 to see if a 5 micromolar solution of retinoic acid would result in a significant difference in the regeneration rate compared to the other 20 who acted as a control (only spring water). On the first day, the planaria were measured before and after they were bisected. For the next 14 days, all planaria were measured and recorded on Day 7 and 14. After the trials, it was found that using a one-way ANOVA test with an alpha level of 0.05, there was no significant difference between the control and experimental group for both head and tail portions, on all days, even without potential outliers. The hope for this experiment was that if there was a significant difference between the control and experimental, it would be used towards the field of neuroscience. For instance, neurodegenerative diseases, such as Alzheimer's and Parkinson's, are prominent within the American population because in the brain, neurons die and they regenerate at a very slow pace. When the minimum threshold for retinoic acid is found, future investigations will involve finding the maximum threshold because if cells grow uncontrollably, this can turn into cancer.

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