



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) James T. Pou	Project Number S1519
Project Title Copper and Zinc Contamination as a Factor in Dugesia tigrina Regeneration	
Abstract Objectives/Goals If copper and zinc pollution is lethal to aquatic organisms, and planarians are highly sensitive to even low concentrations of chemicals, then when amputated planarians are placed in an environment containing copper or zinc, the time it takes to regenerate will be negatively affected by contamination. Methods/Materials Planarian regeneration was tested at both a non-lethal and LC50 concentration of copper or zinc. 150+ planarians were used in finding the test concentrations, and an additional 300+ were used in regeneration. Amputated planarians were placed in 12 dish culture wells, 6 for head parts, and 6 for corresponding tail parts. Regeneration was monitored by detecting appearance of photoreceptors or the formation of a translucent triangular tail. Results Results in combination with statistical analysis indicate an apparent adverse relationship between the copper and zinc contamination and the regeneration rate of planarians. The T-test for both posterior and anterior regeneration in non lethal solutions assures that the presence of copper or zinc did not affect the regeneration rate and in doing so accepted the null hypothesis. However, the t-test for posterior regeneration in LC50 copper contamination rejected the null hypothesis, indicating with 99.99% confidence that copper did affect the regeneration rate. Furthermore, all specimens regenerating in LC50 zinc died within 1 day of trial initiations. In addition, the X2 test rejected the null hypothesis, which results in supportive evidence that there is a significant difference between the numbers of specimen alive and number dead for trials using an LC50 concentration. Conclusions/Discussion The research hypothesis was supported for trials using an LC50 concentration. A possible explanation is the added stress of regeneration lowering the LC50. Another possibility is that the continuous exposure to a lethally contaminated environment retarded regeneration to the point of fatality. A possible expansion is investigating the combined effects of both copper and zinc, since it is likely for both pollutants to be found in the same habitat. Another continuation is to repeat the experiment using planarians that have successfully regenerated once before in a contaminated environment, and observe what effects the contaminants have on repeated regeneration.	
Summary Statement Freshwater planarians, known for possessing uncanny regenerative capabilities, were utilized in the process of investigating the effect of the common heavy metal pollutants copper and zinc on the regeneration of Dugesia Tigrina.	
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