



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Akshay K. Srivastava	Project Number 31577
Project Title The Effects of 1, 3, 7-Trimethylxanthine on Planarians and Its Pertinence to Stem Cell Research	
Abstract Objectives/Goals My objective was to discover the effects of caffeine on a regenerating planarian, my replacement for a growing child. I also wanted to know the dosage of caffeine that would cause a reaction in the planarians, so I tested four different solutions of caffeine: zero percent (control), five percent, ten percent, and forty percent. Based on my research, I hypothesized that a five percent or greater caffeine solution would help the planarians' growth. Methods/Materials In order to conduct my experiment, the variables had to be kept consistent. For example, I confirmed that the planarians in each of the four containers had the same average length when I bisected them. Also, there were the same amounts of fluid in each container. After bisecting the planarians and placing them in their respective solutions, I observed and measured them every other day. These observations were continued for two weeks, the normal regenerative span of a planarian. Results I found that the planarians in the 10 percent and 40 percent solutions experienced a short period of accelerated growth, but had little growth after that. Also, these planarians' activity levels were very low. The control group and the five percent solution planarians, on the other hand, had consistent growth were longer than the other planarians by an average of six-tenths of a millimeter. Conclusions/Discussion I concluded that my hypothesis was incorrect, but further research explained why. It was found that neoblasts stimulated by caffeine do not form blastemas, which are essential for planarian regeneration. Additional research also spawned information about the many applications of planarians. Through this extensive study; I was familiarized with the many uses of stem cells in regenerative medicine, and the planarian's valuable role in testing these theories.	
Summary Statement My project observes the effects of caffeine on regenerating planarians.	
Help Received Parents helped obtain supplies; Versha Srivastava (medical student) gave expert advice; Father helped tape boards together; Ashwani Srivastava (medical student) helped identify appropriate caffeine solutions.	