



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Lucas Popescu	Project Number J1918
Project Title The Effects of IAA and Urea on Bean Plant Germination	
Abstract Objectives/Goals The objective of my experiment was to compare the effects of the hormone IAA and the fertilizer urea, on bean plant germination. Methods/Materials Three rows of six petri dishes per row were aligned, each of the three rows having three different concentrations of IAA, urea and control. For each of the substances and concentrations two pairs of petri dishes were used. Once all the appropriate concentrations were added, the petri dishes were put into the incubator for 7 days at 30 degrees Celsius and observed over a one-week period. Results I learned that the plants I added the hormone IAA and fertilizer urea, actually grew less than the control group plants. For the IAA plant group, only one concentration grew with an average of 16.5 hairs, and a root length of 1.25 centimeters. For the urea group the largest average amount of hairs that grew was 11.5 hairs, and at most 1.75 centimeters of root length. For my control group, the highest average for root hairs was 14, and the largest root length average was 4 centimeters Conclusions/Discussion I believe that my results could have occurred this way for multiple reasons. First, it is possible that the concentration of urea might have been too high. From the articles I read I learned that urea releases pollutants as it decomposes, and could even possibly burn plants from its acidity. Secondly, I think the plants with IAA might have grown this way, not because the concentration was too high, but maybe the hormone helped them adapt better, so they would have better living conditions later on. For example, the large amount of hairs on the IAA group can be because those hairs would make it easier to absorb water and nutrients during growth. Even though my experiment did not confirm my hypothesis, I learned about lab safety, using incubators, about hormones and plants, how to do background research, and how to present my science fair project correctly. I am planning to continue this experiment next year, and look at the bean plant's overall growth, not just its germination, as well as trying to use various other concentrations of IAA and urea. I also believe that I need to learn more about the role of root hairs (branches) because I am still wondering why the IAA had more effect on the hair growth compared to the root growth.	
Summary Statement My project compares how the plant hormone IAA and the fertilizer urea affect the germination of bean plants.	
Help Received My mother helped me with lab equipment, spellchecking and with the board. My father helped me Excel and how to create my graphs.	