



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

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| <b>Name(s)</b><br><b>Anika Jain; Anuva Mittal</b>   | <b>Project Number</b><br><br>34339 |
| <b>Project Title</b><br><b>The Effects of Thyroxine and Insulin on the Growth of Brassica rapa</b>  |                                    |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>Inability to grow plants efficiently is a common inhibitor of the food and medicine consumerism market. Finding a viable solution to this problem would be net beneficial, so we tested the effects of animal insulin and thyroxine on Wisconsin Fast Plants ( <i>Brassica rapa</i> ).<br><b>Methods/Materials</b><br>We created eight groups of plants with varied concentrations of the hormones: 5 and 50 mcg/mL of just insulin, 5 and 50 mcg/mL of just thyroxine, 5 mcg/mL insulin and 5 mcg/mL thyroxine mixed, 50 mcg/mL insulin and 50 mcg/mL thyroxine mixed, 5 mcg/mL insulin and 50 mcg/mL thyroxine mixed, and 50 mcg/mL insulin and 5 mcg/mL thyroxine mixed. Using a micropipette to measure out the exact amounts of hormone, we created solutions dissolved in water, and we watered the plants with the solution three times a week.<br><b>Results</b><br>The plants treated with solely insulin at a low concentration grew more than those with a higher one, but they all unexpectedly died after approximately 20 days. The plants with thyroxin barely grew. With the mixed hormones, the plants with 5 mcg/mL of both thyroxin and insulin grew the most compared to the control.<br><b>Conclusions/Discussion</b><br>In the human body, secreted from the pancreas, insulin absorbs excess sugars from the bloodstream, keeping the level of sugar balanced in the body. If there is too much or too little insulin in the body, it will not allow the brain to function properly. Based on these facts, the plants reacted the same as the human body to the insulin. On the other hand, in the human body, thyroxine is a metabolic hormone. Again, there needs to be an exact balanced amount in the human body for it to properly function. The plants reacted in this same way in response to the thyroxine. In the future, we can experiment with different plants or hormones, such as glucagon, which has a role opposite that of insulin. |                                    |
| <b>Summary Statement</b><br>Our central goal was to determine the effect of animal hormones, specifically thyroxine and insulin, on plants.   |                                    |
| <b>Help Received</b><br>Mentor helped us create the solution that the thyroxine was dissolved in, as it was a toxic acid  |                                    |