



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kush P. Das	Project Number S0405
Project Title The Effect of Glucose on the Growth Hormone Secretagogue Receptor in the Pituitary Gland of Tilapia	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My goal in this experiment was to test the effect of glucose on tilapia. The effect of glucose was taken into consideration because tilapia belong to a sub-species of fish called teleost fish, which are glucose intolerant. The effects of the glucose, and the subsequent reduction of blood glucose, on the growth hormone level, the level of growth hormone receptor, and the ghrelin level. I tested these because I expect a difference in the expression levels than observed in humans and other mammals.</p> <p>Methods/Materials Great care was taken with the fish to retain the highest level of humanity, and also to prevent any confounding variables. I was not present at this basic stage of the experiment, as it calls for the harvesting for the pituitary gland, and other tissues for later analysis. After these were harvested, I ran a series of tests, including qPCRs, and other forms of analysis. These tests were performed to find the inherent effect of the glucose administration on the hormones in question (ghrelin, and growth hormone). The results from these tests led me to draw certain conclusions.</p> <p>Results Blood glucose levels in the fish peaked 6 hours post-intraperitoneal-injection, and then returned to normal 24 hours later. A significant increase was seen in the ghrelin level of the experimental group compared to that of the control. Glucose is shown to have no significant effect on plasma growth hormone levels. The administration of glucose significantly elevated ghrelin receptor mRNA levels in the pituitary gland, conversely the pituitary GHS-R levels went unchanged.</p> <p>Conclusions/Discussion The results of the experiment further support evidence that teleost fish have no metabolic necessity for glucose. The lack of expression of growth hormone and the increase instead of decrease, which is observed in most mammals, of ghrelin is evidence that glucose affects these fish differently. More specifically, the fish do not need glucose to survive, this has real-world implications in the world of diabetes. Diabetics share one thing with these fish, their glucose intolerance and perhaps, through some kind of hormone therapy, or a further investigation on what the fish use to replace their glucose necessity, we can devise a way to rid diabetics of this need for glucose.</p>	
Summary Statement The effects of glucose on the GHSR in tilapia, a type of fish which belongs to a group of fish which are glucose intolerant; the levels of blood glucose, ghrelin (regulates growth hormone), growth hormone receptor, and growth hormone.	
Help Received lab equipment at csu fresno, under the supervision and guidance of dr. larry riley, and casey dorough.	