



CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY

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<b>Project Title</b> Does Measured Blood Glucose Correlate with Tear Glucose?	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> About 347 million people worldwide have diabetes. More than 80% of diabetes deaths in the world occur in low income countries because of lack of awareness. Current testing methods of measuring glucose are complex, expensive and invasive. The objective of this project is to extend our last year project of measuring the concentration of glucose in eye tears by correlating Refractometer Brix scale with actual blood sugar level measured in milligrams per deciliter (mg/dL).</p> <p><b>Methods/Materials</b> The two instruments we used to measure the glucose are Brix Refractometer and Blood Glucometer. We already know Brix Refractometer based on our analysis can measure sugar in the tears and Blood glucose monitor can check sugar in the blood drop. The Methods consists of two steps, measuring the Tear Glucose concentration using the Refractometer and measure blood Glucose using a Glucometer for various participants.</p> <p><b>Results</b> In this project as planned we collected blood glucose and tear glucose readings from several participants across various ages who are non-diabetic as well as diabetic. We used Pearson Correlation coefficient for comparing Brix scale vs Blood Glucose to correlate the results. We choose this method since it is every popular method used by statisticians. In order to determine how strong the relationship is between two datasets, a formula is used to produce what is referred to as the coefficient value. From the base line data we gathered on various participants, we conclude the results approve our hypothesis. As the Pearson correlation coefficient shows a positive value of 0.796. We could confidently conclude there is a strong relationship and positive correlation between Brix scale vs Blood glucose in mg/dL. However with the limited sample, We CANNOT conclusively confirm this with a degree of certainty. A bigger sample size of hundred may give us a better idea and results.</p> <p><b>Conclusions/Discussion</b> Looking at the data we support our original question #Does measured blood glucose correlate with the tear glucose# that there appears to be a positive correlation between Brix scale as compared to Blood glucose.</p>	
<b>Summary Statement</b> We demonstrated that there is a positive correlation between the measured blood glucose and tear glucose in humans.	
<b>Help Received</b> Thanks to our teacher for mentoring us and our parents for driving us around to gather data.	