



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Geneva R. Schlafly</b>	<b>Project Number</b> <b>S0533</b>
<b>Project Title</b> <b>Genomic Reliability of Consumer Tests</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective is to determine the reliability of conclusions about human traits based off of a genomic personal consumer test.</p> <p><b>Methods/Materials</b> I collected saliva from five individuals and had the DNA sequenced. I used published reports showing a correlation between traits and individual SNPs. Using a combination of math and statistic techniques and the SNPs in the data file, I calculated 95% confidence intervals for traits.</p> <p><b>Results</b> Reasonable error bars can be found for breast cancer. Non-brown versus brown eye color can be predicted with fairly high accuracy. Only very large error bars can be found for obesity/diabetes.</p> <p><b>Conclusions/Discussion</b> Services for consumer tests offer risk measurements for traits, but error bars are never given. The error bars I calculated give an approximation of the reliability. For some traits the consumer traits serve as a good first check to see if further medical testing should be done. Combined with other health information, this information become even more useful. One the other hand, for some traits the conclusions based off the genes are practically useless because of the large error bars.</p>	
<b>Summary Statement</b> I determined error bars for traits based off of DNA from genomic consumer tests.	
<b>Help Received</b> I used much help from online for learning the biology material. I ran over my initial plan with a genetics professor for five minutes, but she didn't have any suggestions. Science journals such as Nature Genetics was very useful to learning which SNPs were correlated with which traits based on large studies.	