



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Shivani Gupta	Project Number 36412
Project Title A Quantification of Anthocyanin Levels in Fruits	
Abstract Objectives/Goals This project aims to quantify anthocyanin levels present in grape and plum seeds and skins through the ORAC assay, the oxygen equivalent antioxidant capacity assay. Many of the health benefits attributed to red and purple colored fruit are due to the pigments heavily concentrated in the skin and seeds, which have about 100 times higher phytochemical or antioxidant concentration than the pulp. It was predicted that the darkest colored fruit will have the highest ORAC value, and the skins will have the highest antioxidant capacity. Methods/Materials The skins and seeds of seven different grape and ten various plum species ranging across a wide color spectrum were tested. Grape and plum skins and seeds were extracted first with water and then with acetone. These seed and skin extracts of grapes and plums were analyzed with a fluorescence spectrophotometer to determine ORAC value readings, and then converted into Trolox equivalents. Results In general, the grape skins had a higher antioxidant value than the seeds. SG19, the darkly red-colored grape species had the highest ORAC value. SG38 (the darkest colored grape variety, and SG34, a medium red colored grape species, had the total skin antioxidant capacity. Plum skins and seeds are currently being analyzed. Conclusions/Discussion While SG34, the darkest colored grape species, had the highest antioxidant capacity for total skins, it was not statistically significant by the Anova test in ORAC value from SG38. No directly linear correlation has been observed between grape hue and antioxidant capacity. Thus, to gain the highest health benefits from grapes, it is recommended to consume extremely dark or slightly red colored grapes. For pharmaceuticals utilizing grape seed extract, it is recommended to use darkly red colored grapes, and for those using grape skin, dark blue or medium red colored grapes are suggested for maximal antioxidant concentration.	
Summary Statement Using the ORAC assay, I discovered there is no direct correlation between grape hue and total antioxidant capacity.	
Help Received I conducted the ORAC assay by myself. I got help in understanding the procedure from Dr. Forester at California State University Bakersfield. I received grape and plum samples from SunWorld International LLC.	