



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) Alec Mesropian	Project Number 34722
Project Title Cavity Charisma: The Future of Dental Fillings	
Objectives/Goals To determine whether adding synthesized amounts of a calcium carbonate paste to a detoxified cavity will cause the organic filling and composure of a tooth without the need for an inorganic filling because of the properties of the paste. Secondly, to determine what solution causes the least damaging cavity and fills to the most durable standard possible after it was hypothesized as being the sugar solution. Abstract Methods/Materials First, nine molars were gathered from dental professionals and exposed to a sugar solution, carbonated drink solution, and white vinegar in order to create cavities over seven months. Once the teeth with cavities were removed from the liquids, they were disinfected, rated for cavity severity, filled with a calcium carbonate paste, assessed again, and then evaluated for durability using human saliva and chewing tests with mouth models. Dentists and oral surgeons were consulted in order to develop a standardized scale of one to five (one=terrible, five=exceptional). Three trials were done. Results The hypothesis was proven correct, the sugar solution created the smallest and least harmful cavity that was able to be filled well and remained strong against the durability tests in the experimental procedure because of its compact nature. It seems as though a natural filling is plausible, but can only work well with relatively small cavities, such as those created by the sugar solution. The fillings increased in severity, due to width and depth from the sugar solution to the white vinegar and to the carbonated drink solution. Also, the fillings were not able to compact itself well enough into the larger cavities and tended to ooze out during durability and rating tests. Conclusions/Discussion The conclusion of this experiment provides valid evidence that a more organic and harmless tooth filling can be used to complete the same job as most silver amalgam and white resin fillings at a fraction of the cost. For instance, most silver amalgam fillings range from \$75 to \$100, while white resin fillings range from \$150 to \$300. The fillings composed in this experiment did not exceed a price of \$50. This project may be improved by experimenting with different teeth, solutions, and pastes with incorporated stem cells to rebuild tooth tissue and rehabilitate damaged teeth more extensively.	
Summary Statement This project is meant to determine whether naturally composed dental fillings made of a calcium carbonate paste are viable replacements for inorganic dental fillings currently used to fill cavities.	
Help Received Dr. Stella Baghdasarian and associate oral surgeon aided in developing a rating scale and in consulting.	