



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Stephen T. Ott	Project Number S1616
Project Title Using Tardigrade DNA to Make Bacteria Resistant to Radiation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals How are astronauts going to even survive getting to Mars with all the radiation they would be rendered helpless against? Assuming that humans do find a way to get to Mars safely in the next few decades, then what? How can we prevent skin cancer that many people around the world contract just because they have to be in the sun a lot? These are all problems that could be easily abridged by human cells or plants cells having a higher resistance to radiation.</p> <p>Methods/Materials Research showed that bacteria may be able to resist higher doses of radiation if given the gene to manufacture a protein called Dsup, short for damage suppressor. Following that line of thought, how hard is it to give bacteria these genes? Turns out, this can be achieved through a bacterial transformation with a plasmid with the gene for Dsup and resistance to the antibiotic ampicillin.</p> <p>Results While this research was unable to determine if our transformed bacteria actually were radiation-resistant, the bacterial transformation was a success, as evidenced by the simple fact that bacteria were growing on the petri dishes with ampicillin.</p> <p>Conclusions/Discussion This research had the goal of learning more about Dsup, how it protects DNA, and if this would lead to cells being able to therefore survive larger doses of radiation. While I was unable to ascertain if this was true experimentally, future experiments are planned to determine once and for all if there is in fact a way to make cells able to survive larger doses of radiation.</p>	
Summary Statement I attempted to create bacteria that were resistant to radiation.	
Help Received My project adviser, having almost a decade of experience in biotechnology, advised me and helped to set up the experiment and provided materials, however the actual procedure was still executed by myself	