



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sourish Bairaboina; Akshaj Bansal</b>	<b>Project Number</b>  36284
<b>Project Title</b> <b>Testing the Veracity of Cope's Rule on Microorganisms</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Cope's Rule postulates that descending lineages of a certain species tend towards an increased body size. It has been hypothesized that larger sizes allow for greater genetic diversity, allowing larger individual of the species to adapt to the changing environment. The presented results are the product of exposing different groups of bacteria to a constant environment with one varied, hazardous condition. The presented research originally attempted to find some parallels between microbial and macro-ecology. <b>Methods/Materials</b> Diluted Ultraviolet C radiation and a bleach-water solution were incorporated within the environment of 3 bacterial species: bacillus Cereus, bacillus Megaterium, and bacillus Thuringiensis. <b>Results</b> By finding the ratio of bacterial growth in the hazardous environment to the growth at optimal conditions, we tested the general ability each species possessed in adapting to its environment. Contrary to the belief that the largest species, bacillus Megaterium, would show the largest ratio of growth, in UV C light trials, the species Bacillus Cereus performed better. Under the UVC light, the bacillus Megaterium, Cereus, and Thuringiensis had a ratio of 0.65, 0.86, and 0.57, and under bleach, the ratios were 0.78, 0.64, and 0.31, respectively. Thus, the obtained results lead to mixed results, and debatable interpretations. <b>Conclusions/Discussion</b> With these uncertain results, definite benefits are not immediately visible. However, this uncertainty proves that size in microorganisms does not play as prominent of a role in evolution as it does in organisms of the kingdom animalia. This may prompt more research to find a link between the size and adaptability of microorganisms.	
<b>Summary Statement</b> As we presented environmental hazards to bacteria, the largest bacteria flourished under bleach while the smallest bacteria excelled under radiation.	
<b>Help Received</b> My biology teacher, Am Hanoian, offered materials and understanding about correct procedures for the experiment.	