



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <p align="center"><b>Ahon Sarkar</b></p>	<b>Project Number</b> <p align="right">31604</p>
<b>Project Title</b> <p align="center"><b>Effect of Three SIRT-1 Inducers on the Production of Alzheimer's Causing Beta Amyloid Plaques</b></p>	
<p align="center"><b>Abstract</b></p> <p><b>Objectives/Goals</b>          Alzheimer's disease is a progressive brain disorder that is ultimately fatal, and it has become the sixth leading cause of death. It is caused by the the accumulation of plaques of beta amyloid 40 and 42 peptides, which result from the sequential cleavage of APP by the beta and gamma secretases. The production of beta amyloid peptides can be avoided by alternate cleavage of APP by alpha and gamma-secretases. In this project, Resveratrol, in three forms, (grape seed extract, curcumin extract, and resveratrol dietary supplement) was used to induce the production of SIRT-1, an NAD dependent deacetylase that controls the production of the beta secretase. The three agents were tested to see if they would reduce the number of beta amyloid 42 peptides present, thereby slowing or halting the progression of Alzhiemer's.</p> <p><b>Methods/Materials</b>          Neuro2a mouse cells were grown in flasks in an Eagle Medium until they reached 75% confluency, and then transferred to two 6-well plates. They were then transfected with purified APOE-4 bacterial plasmid to give them Alzheimer's and later treated with their respective agents (grape seed extract, curcumin extract, and resveratrol dietary supplement extract) in 30 micro molar concentrations. The cells were finally run through an ELISA to determine the presence and quantity of the beta amyloid 42 peptides.</p> <p><b>Results</b>          The curcumin performed the best, with a concentration of 89.1 pg/ml of the peptide, the resveratrol extract dietary supplement performed second best, with a concentration of 105.8 pg/ml, and the grape seed extract performed the third best, with a concentration of 113.5 pg/ml. All treated wells had significantly lower beta amyloid 42 peptide levels than the positive control, which had a concentration of 198.1 pg/ml.</p> <p><b>Conclusions/Discussion</b>          My hypothesis that curcumin, resveratrol extract, and grape seed extract would lower the amount of beta amyloid 42 peptides was supported by my experimental results. This project shows that resveratrol is a potential candidate to be the drug that ends Alzheimer's for good. It slows the progression of Alzheimer's by slowing the production of beta amyloid 42 peptides. In the future, further tests will be performed to verify its potential as a 'cure', and such tests will be done on better simulations of the human body, like human cells or live mice.</p>	
<b>Summary Statement</b> <p>This project tests three types of resveratrol on mouse neuronal cells with Alzheimer's to see if it stops or slows down the production of the plaques that cause the disease</p>	
<b>Help Received</b> <p>Mentor helped teach me the procedures that I did not know about before (e.g. ELISA)</p>	