



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

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| <b>Your Name</b> (List all student names if multiple authors.)<br><b>Joy S. Bhosai</b>   | <b>Science Fair Use Only</b><br><br><span style="font-size: 2em; font-weight: bold;">S1304</span> |
| <b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)<br><b>Beta-Amyloid Induced Neurotoxicity and the Protection of Cognitive Function with Usage of Progesterone in ERT</b>  | <b>Division</b><br>_ Junior (6-8) <u>X</u> Senior (9-12)  |
| <b>Preferred Category</b> (See page 5 for descriptions.)<br><b>13 - Pharmacology / Toxicology</b>  |   |
| <b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.)<br>Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.   |   |
| <p><b>OBJECTIVE:</b> Two main objectives in this project focus on neurotoxicity and neuron protection. Two phases of the experiment keep the variables constant with respect to the goal of each experiment. The first phase determines the neurotoxicity factor of Beta-Amyloid protein in planarian cognitive (memory) function. The second phase determines the influence of the supplementary use of progesterone in estrogen therapy (ERT) to maximize protection against possible neurodegenerative disorders, namely Alzheimer's.</p> <p><b>METHODS/MATERIALS:</b> The first phase determines the neurotoxic factor by comparing the control with an experimental group that has been injected with the <math>\beta</math>-Amyloid protein. The second phase puts planarian groups into 3 different hormonal groups: estrogen, combined estrogen and progesterone use, and progesterone. All the planaria were trained to swim to the right to display cognitive learning because innately planarian swim feeding to the left. To keep outside variables controlled, all the planaria were screened beforehand to ensure that the planaria innately feeding to the right were rejected from participating in the experiment. I left the groups for 4 days after the introduction of the <math>\beta</math>-Amyloid. Then I retrained them to see if they maintained their memory in which correct way to swim through the maze. I recorded how many times it took to retrain and compared the results. A Null Hypothesis was evaluated.</p> <p><b>RESULTS:</b> Beta-Amyloid did induce cognitive damage. Supplemental use of progesterone in estrogen therapy did maximize protection against neurodegeneration. Estrogen Therapy did work somewhat in protecting against the damaging effects of the protein, but when used with Progesterone, the protection factor increased by almost twice the amount.</p> <p><b>CONCLUSION/PURPOSE:</b> The purpose of this project is to propose a possible catalyst in the development of Alzheimer's and a possible protectant against the disease. A possible Catalyst was found. This experiment also demonstrated the pertinence of</p> |   |
| <b>Summary Statement</b> (In one sentence, state what your project is about.)<br>This Project proposes Beta-Amyloid protein as possible catalyst for the development of Alzheimer's Disease, along with a form for maximizing protection against Alzheimer's by using Progesterone in Estrogen Therapy.  |   |
| <b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.<br>The project was done independently all at school. Materials used were from Buchanan High School.  |   |