



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

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| Name(s) Pavan Gollapudi | Project Number S1413 |
| Project Title The Effect of Thimerosal on the Expression of Pro and Anti Apoptotic Proteins | |
| Abstract Objectives/Goals Apoptosis is a form of cell death. It plays a major role in the immune system by regulating the number of cells necessary. It has also been linked to be responsible for cancer, AIDS, and Alzheimer's disease. Bcl2 and Bax are two intracellular proteins known to regulate apoptosis. Bcl2 protects the cell from apoptosis, whereas Bax promotes apoptosis. Thimerosal is a commonly used preservative in vaccines, and contains the toxic metal mercury. Thimerosal has also been addressed to raise mercury levels in infants. Previous studies have also shown that thimerosal causes problems in the immune system including apoptosis in lymphocytes. In this study, the effect of thimerosal on the expression of Bcl2 and Bax was examined. Methods/Materials In this experiment, cells were exposed to thimerosal, and then stained with antibodies labeled with fluoresceine. A flowcytometer was used to measure the amount of fluorescence, which directly proportional to the amount of Bcl2 or Bax present. A non-specific IgG antibody was used as a background staining to determine if there was in fact a change in the amount of protein expressed. Results The results showed that thimerosal induced apoptosis by decreasing the ratio between Bcl2 and Bax, making it more susceptible to apoptosis. Thimerosal drastically lowered the amount of Bcl2, while it did not affect the amount of Bax as significantly. | |
| Summary Statement Thimerosal, a vaccine preservative, induces apoptosis in T-cells by altering the ratio between anti-apoptotic proteins(Bcl2) and pro-apoptotic proteins(Bax). | |
| Help Received This experiment was carried out at UCI under the supervision of my father. | |