



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

|   |                                    |
|---|------------------------------------|
| <b>Name(s)</b><br>Austin G. Bathgate  | <b>Project Number</b><br><br>31589 |
| <b>Project Title</b><br>How Does Pain Medication Affect Your Liver?   |                                    |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>To determine if and what effects the commonly used pain relievers, acetaminophen, ibuprofen, and aspirin have on beef liver cells.</p> <p><b>Methods/Materials</b><br/>Materials: beef liver from the grocery store, acetaminophen, ibuprofen, aspirin, saline (.9% NaCl), test tubes, beakers, pipettes, microscope, microscope slides, slide covers, methylene blue, test tube holder, camera, computer.</p> <p>Methods:<br/>I mixed each of the medicines with saline, and let it sit for a day to dissolve at room temperature. Then I mixed small pieces of beef liver with the saline to make a cell solution. Next I placed the medicine solution and cells in a test tube and let it sit for ten days. After 10 days I looked at the solution under a microscope at 40X using methylene blue stain. I looked at the damage to the cells. Then I took pictures of the cells.</p> <p><b>Results</b><br/>After performing my experiment, I saw that aspirin barely damages the liver cells compared to acetaminophen and ibuprofen. The acetaminophen and ibuprofen damage the cell's membrane with the ibuprofen doing the most damage.</p> <p><b>Conclusions/Discussion</b><br/>After completing my experiment, I would not recommend taking acetaminophen or ibuprofen because it damages the liver cells. I would recommend taking aspirin since it does little damage to the cells.</p> |                                    |
| <b>Summary Statement</b><br>My project is to show the effects of acetaminophen, aspirin, and ibuprofen on the liver.  |                                    |
| <b>Help Received</b><br>Used microscope at Rancho Christian School under supervision of Mrs. Wight  |                                    |