



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Gautam S. Vaidyanathan</b>	<b>Project Number</b> <b>J0532</b>
<b>Project Title</b> <b>Which Commercial Ibuprofen Tablet Has the Greatest Dose Variation?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My objective was to assay Ibuprofen in commercial Ibuprofen tablets by High Performance Liquid Chromatography in order to determine which brand of commercial Ibuprofen tablet has the greatest dose variation. <b>Methods/Materials</b> Four brands of Ibuprofen caplets (200 mg), namely, Motrin, Advil, Sav-On, and Kirkland were chosen. Ten caplets from each brand were tested for Ibuprofen content using High Performance Liquid Chromatography. The assay procedure as described under the monograph for Ibuprofen Tablets in the United States Pharmacopeia was followed with minor modifications. The percent assay, standard deviation and relative standard deviation were calculated for each brand. The RSD values were compared. <b>Results</b> The percent assay value, for each of the ten caplets tested, for all brands of Ibuprofen, was within the specification required by the USP monograph. The Advil brand of Ibuprofen caplets had the highest relative standard deviation for percent assay values at 1.64. Motrin had the lowest RSD at 1.07. Thus, the brand of Ibuprofen that had the greatest dose variation was Advil. <b>Conclusions/Discussion</b> I thought that large pharmaceutical companies, which manufacture Motrin and Advil, most probably spend more money on optimizing their manufacturing process. Through this optimization they will be able to achieve more accurate amounts of Ibuprofen and hence have a small dose variation. Of the other two generic brands, I hypothesized that the Kirkland brand would have a greater dose variation than the Sav-On brand because Sav-On is a pharmacy while Kirkland/Costco sells many different products. However, my data did not support my hypothesis. Advil brand of Ibuprofen had the greatest dose variation.	
<b>Summary Statement</b> To determine which commercial Ibuprofen tablet has the greatest dose variation.	
<b>Help Received</b> used laboratory facilities, equipment, and instruments at GRAM Laboratories, Inc. under the supervision of my father, Rajaram Vaidyanathan. My father helped me type the report.	