



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Qianyun Lin</b>	<b>Project Number</b> <b>J0513</b>
<b>Project Title</b> <b>Enzyme Catalase: The Key to Hydrogen Peroxide</b>	
<div><div><b>Objectives/Goals</b> In my science fair project, I want to determine whether the change in temperature will have a positive or negative effect in the decomposition reaction between hydrogen peroxide in the presence of the enzyme catalase. Both animal and plant enzymes will be tested and compared.</div><div><b>Methods/Materials</b> Distilled water, refrigerator, coffee filters, ice chest, ice cubes, hammer, raw potatoes, graduated cylinder, scale, blender, thermometer, hydrogen peroxide 3%, pork liver, test tubes</div><div><b>Results</b> Testing was done at the following temperatures: 5°C, 19°C, 23°C, 38°C, 44°C and 55°C. Three trials were completed at each temperature for both animal and plant enzymes. I conclude that the enzyme catalase works the best at 38 degrees C. The graphs on my board will indicate my results for all the temperatures that were tested along with the averages for each.</div><div><b>Conclusions/Discussion</b> From my testing, I concluded that my hypothesis is partially correct. The time that it takes for catalase to break down hydrogen peroxide does decrease when the temperature rises, but the act of decreasing stops when the hydrogen peroxide reaches a certain temperature. The reaction time will differ as the temperature is changed, but the best result for both the plant and animal enzyme was close to the human body temperature of 38°C. The chemical formula for the whole reaction is <math>2\text{H}_2\text{O}_2 + \text{catalase} \rightarrow 2\text{H}_2\text{O} + \text{O}_2</math>. Hydrogen peroxide is the substrate that fits with catalase and catalase breaks the molecule apart then releases water and oxygen.</div></div>	
<b>Summary Statement</b> My project is to find out whether the changing in temperature will have a positive or negative effect on the decomposition reaction between the enzyme catalase and hydrogen peroxide.	
<b>Help Received</b> My science teacher provided all the lab equipment need for my testing.	