



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexis J. Nahigian</b>	<b>Project Number</b> <b>J0409</b>
<b>Project Title</b> <b>A Study of Osmosis and Diffusion through a Simulated Cell Membrane</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My project was to determine whether or not iodine molecules will be able to diffuse through a plastic sandwich bag (cell) containing a starch solution. The second objective was to determine whether or not glucose molecules will diffuse out of the "cell." The third objective was to determine whether or not osmosis occurs in this experiment.</p> <p><b>Methods/Materials</b> A starch solution was poured into ten Glad sandwich bags. These bags(cells) were placed into ten beakers containing an iodine solution. The bags were observed for color change at fifteen minute intervals for one hour. The bags were weighed to determine mass gain or loss. The testing was conducted in different environmental temperatures. A glucose solution was poured into ten Glad sandwich bags. The bags were placed into ten beakers containing distilled water. At fifteen minute intervals, up to one hour, distilled water from each beaker was poured into test tubes containing Benedict's solution. These test tubes were heated to watch for the presence of glucose. Results were recorded and bags were weighed to determine mass gain or loss. This testing was conducted in the same environments mentioned above.</p> <p><b>Results</b> For the starch and iodine experiment, the greatest rate of diffusion occurred in the heated environment and the least in the refrigerated environment. However, the bags in the heated starch/iodine experiment showed the least mass gain. Temperature appeared to have no affect on the glucose experiment because no presence of glucose was found in any of the testing. However, the bags in the heated glucose experiment showed the highest mass gain.</p> <p><b>Conclusions/Discussion</b> The results partially supported my hypotheses. I thought that the iodine solution would diffuse through the "cell" membrane and the glucose solution would not. This was correct. The results for the various temperature environments were partially correct. I stated that the starch grains would show the most coloring in the heated environment, and this was correct. In the glucose experiment, greater osmosis occurred in the heated environment. In the starch experiment, greater osmosis/diffusion occurred in the refrigerated environment. In conclusion, this experiment helped me gain a better understanding of how a cell membrane controls the osmosis and diffusion of molecules, and it helped me understand how molecular motion can be affected by varying temperatures.</p>	
<b>Summary Statement</b> My project is about how a cell membrane controls osmosis and diffusion and how osmosis and diffusion are affected by temperature.	
<b>Help Received</b> Mother helped with board; Dad helped type.	