



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Julie N Thai</b>	<b>Science Fair Use Only</b>  <b>S1222</b>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Determining the Amount of Yeast Cells' Uptake of Lead Versus Calcium</b>	<b>Division</b> <u>S</u> Junior (6-8) <u>S</u> Senior (9-12)
<b>Preferred Category</b> (See page 5 for descriptions.) <b>13 - Pharmacology / Toxicology</b>	
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>This objective is to determine whether yeast cells in a given medium will uptake the amount of a lead-based solution preferably over a calcium-based solution introduced to an identical medium.</p> <p>Using Lead Nitrate and Calcium Nitrate solutions, I mixed a fixed amount of each solution into a medium of packaged dry-active yeast, granulated sugar, and distilled water. Letting those mixtures sit for approximately 72 hours, as to enable the lead and calcium ions to penetrate the cell walls, I then used a CO<sub>2</sub> Gas Sensor and CBL Unit to measure the amounts of CO<sub>2</sub> gas produced by both mediums. A third medium was concocted with the addition of both lead and calcium based solutions.</p> <p>Results indicated that the yeast cells growing in the presence of the calcium nitrate solution produced a greater amount of CO<sub>2</sub> gas than the yeast cells in the presence of the lead nitrate solution.</p> <p>According to the results, I suspect that the yeast cells may have been more susceptible to accepting the calcium ions over the lead ions, presented in separate and integrated mediums, due to the calcium and lead ions' inability to completely penetrate and affect the cells. The CO<sub>2</sub> gas measured may possibly have been given off by the yeast cells unaffected by both the lead nitrate and calcium nitrate solutions.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) My project was done to see if cells often mistake lead particles for calcium when those cells are deprived of calcium.	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Edward Urbansky (EPA) helped me find information regarding characteristics of lead and its affects on yeast cells; Mary-Ann Cao (peer) let me use her CO <sub>2</sub> Gas Sensor; Ms. Carol Evans helped with chemistry portion of the project.	