



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Weston Isheim; Jackson McClain; Zachary Vavra</b>	<b>Project Number</b> <b>S1915</b>
<b>Project Title</b> <b>The Paradoxical Parasite</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> In our project we researched, tested and identified the anomaly that we discovered on a sequoia semperviren. This anomaly was a branch of the tree that was still growing in spite of the fact that it lacked the green pigment that is usually in pineneedles. After weeks and weeks of research including but not limited to both group and individual internet research; textbook researching; inquiring the Extension Plant Pathologist Director at the Texas Plant Disease Diagnostic Laboratory, Kevin L. Ong, PhD via email and many more methods, we were able to conclusively prove what it isn't. Proving what it is however was not as easy as we initially thought.</p> <p><b>Methods/Materials</b> One of our intermediary hypotheses was that the anomaly contained chloroplasts that were void of the natural green pigment. To test this we ran an AP Biology Lab called The Floating Leaf Disk Assay Lab. This proved that the pine needles did not undergo photosynthesis and therefore we could infer that they were, in fact, lacking chloroplasts.</p> <p><b>Results</b> This proved that the pine needles did not undergo photosynthesis and therefore we could infer that they were, in fact, lacking chloroplasts. During this lab however we found that there was one pine needle that was half filled with chloroplasts and half void. It looks like there was a line drawn down the middle seperating the normal side from the anomolous. This caused us to continue researching in a new direction.</p> <p><b>Conclusions/Discussion</b> While conducting our project we put serious thought and effort into several possibilities of what the anomaly could be. Originally we thought it was a genetic mutation, or disease, but eventually we concluded that this branch is a previously undiscovered manifestation of a transposable element infecting a meristem tissue, which then caused the loss of chloroplast. This anomaly has only been documented in corn thus far but hopefully our possible additions to the scientific community will further the knowledge of the plant sciences and open the doors of investigative inquiry for us and others.</p>	
<b>Summary Statement</b> Studying and identifying an anamoly in local sequoia semperviren.	
<b>Help Received</b> Used Lab Equipment from Western Sierra Collegiate Academy	