



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Jonathan R. Deans	Project Number 22551
Project Title Characterization of the Arabidopsis Auxin-Response Mutant 4(4,2) and an ARM Gene	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Professor Mary Williams at Harvey Mudd College has identified a mutant in the plant Arabidopsis, and as a result of past experiments has concluded that it contains an F-Box motif and is similar in its phenotypical mutations to the f-box containing mutant TIR1. Both of these genes, when mutated show reduced shoot growth, and reduced lateral root growth. I plan to further research this plant mutation to give it an identity and know its purpose in the plant, and also to locate it on the chromosome.</p> <p>Methods/Materials To reach this goal I used the methods of a new field of science called Bioinformatics to compare and contrast this mutation with other genes in the Arabidopsis genome. This field of bioinformatics is done mostly on the computer using internet sites with databases of genomes. All of the lab work consisted of extracting DNA through buffers and washes, and using a PCR to duplicate the region of interest.</p> <p>Results My results showed that, from the plants whose DNA registered on the gel, all but one had the DNA of the mutant plant. The one other plant showed a normal plant. My results from comparing the gene sequence of the mutant gene to others in the genome were impressive. I only found one other gene that was closely related, but it was located on chromosome 2, not the chromosome in focus.</p> <p>Conclusions/Discussion From my results, it may have seemed as if the one plant whose results were not expected would turn my hypothesis of the region where the gene is encoded around, but after running plant 16 again the results were the same. What this tells me is that the gene does not lie south of where my specific primers ended, which only improves hypotheses about the genes locations. My results from the genome searches showed that there are other f-box proteins in the genome, and only a few are similar to the mutant that was found.</p>	
Summary Statement My project was the work in further identifying a mutant which nothing is known about in the plant Arabidopsis	
Help Received Mother proof-read project and helped assemble board. Used lab equipment at Harvey Mudd College under the supervision of Dr. Mary Williams	