



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Shantal N. Villalobos	Project Number S0429
Project Title The Effects of Calcium Regulation on Flower Timing in Arabidopsis	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals THERE HAS BEEN PREVIOUS ANALYSIS OF AN ACA2 MUTANT IN ARABIDOPSIS THALIANA, WHICH IS A MUSTARD PLANT WITH A CALCIUM-PUMP KNOCKED OUT. SINCE THE ACA2 MUTANT SHOWED A DELAY IN THE FLOWER TIMING, THERE IS A POSSIBILITY THAT THE REASON FOR THE DELAY WAS THE ABSENCE OF THE CALCIUM-PUMP. IN THIS PROJECT, A DIFFERENT ALLELE (ACA2-3), WAS CHOSEN AND TESTED FOR ITS ROLE IN CALCIUM REGULATION. THE PURPOSE OF THE PROJECT IS TO SHOW THAT THE ABSENCE OF THE PUMP IN THE ACA2-3 GENE CAUSES A DELAY IN THE FLOWER TIMING AS WELL. IF EXPERIMENTS SHOW THE PHENOTYPE OF DELAY IN FLOWERING IN BOTH CONDITIONS, THEN WE CAN BE REASONABLY SURE THAT THE CAUSE OF THE DELAY IS THE ABSENCE OF THE CALCIUM-PUMP.</p> <p>Methods/Materials PLANTS WERE GROWN UNDER SPECIAL CONDITIONS, SPECIFICALLY IN A CONVIRON PRODUCING 12 HOURS OF LIGHT AND 12 HOURS OF DARKNESS. AS WELL AS A SEPARATE PLANT ROOM UNDER CONSTANT CONITIONS OF LIGHT (24 HOURS OF LIGHT). THE PLANTS WERE SEPARATED ACORDING TO THE LIGHT CYCLE. 4 FLATS OF SEED WENT TO THE 12/12 CONVIRON, AND 4 FLATS WENT TO THE 24-HOUR PLANT ROOM. THE DATA SHOWS THAT THE ACA2-2 GENE DID INFACT SHOW A DELAYED PHENOTYPE UNDER 24 HOUR LIGHT CONDITIONS.</p> <p>Results THE ACA2-3 GENE SHOWED A DELAYED PHENOTYPE . UNFORTUNATELY, THE ACA2-2 GENE DID NOT SHOW THE SAME PHENOTYPE UNDER THE 12/12 HOUR CONDITIONS WHEN THE ACA2-3 GENE DID SHOW A DELAY.</p> <p>Conclusions/Discussion THESE RESULTS CONCLUDE THAT IT IS NOT THE MISSING CALCIUM PUMP THAT CAUSES A DIFFERENT PHENOTYPE. THEREFORE, I CAN SAY THAT IT IS BECAUSE OF ANOTHER MUTATION IN THE GENE THAT THE FLOWER TIMING IS DELAYED, AND THAT PREVIOUS BELIEFS OF THE ACA2 PUMP ARE INACCURATE IN THE SENSE THAT THE ACA2 PUMP ALWAYS SHOWS A DELAYING PHENOTYPE. FURTHER RESEARCH CAN DEVELOP TO FIND THE EXACT MUTATION CAUSING THE PHENOTYPES FOUND.</p>	
Summary Statement To see if the deletion of the calcium pump, aca2, is the cause of delayed flowering in Arabidopsis thaliana plants.	
Help Received Used some planting equipment at The Scripps Research Institute	