Your Name (List all student names if multiple authors.)

Jonathan R. Deans

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Arabidopsis thaliana: Data-mining a genome

Preferred Category (See page 5 for descriptions.)

16 - Plant Biology

Abstract (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.

I went to several internet sites that contained the recently finished genome for Arabidopsis thaliana. I then searched for the aminopeptidase genes. I compiled them into a list and began to research them. I did a BLAST search to each to make sure that none of them were the same gene with a different name, and to find any genes the search may not have found. With all of these genes and their information I compiled them into groups based upon their function, or rather, what proteins they cut at the amino end terminal. I chose to further research the Aspartyl Aminopeptidases by submitting their gene sequences and tracing them in the plant to find if they were functionally redundant. To do this Fran Holzer helped me submit them into a Primer3 site which then sent me back their genomic DNA(gDNA). I isolated several parts of the plant and extracted RNA from flowers, siliques(seedpods), stems, cauline leaves, rosette leaves, and roots. Using the RNA i made cDNA, and using the cDNA I was able to anneal the gDNA to each cDNA for each part of the plant. By running this on a gel i was able to find that these two genes were not functionally redundant because they were not located in the same parts of the plant. Many of the families of genes were different sizes, I'm not quite sure if that means that some may be more dependant for the plant yet. I plan to do further testing to see if the plant mutates when grown without the Aspartyl Aminopeptidase.

Summary Statement (In one sentence, state what your project is about.)

I searched the Arabidopsis genome for aminopeptidases and used one family of them to discover whether or not they were functionally redundant.

Help Received in Doing Project (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.

Used lab equipment and University of California Riverside under the supervision of Fran Holzer. Sonya Zarate helped me with the procedures.