



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Allison P. Reed</b>	<b>Project Number</b> <b>J0418</b>
<b>Project Title</b> <b>Can I Clone the Normal GM-CSF Gene Out of My Dog's Tumor?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Last year I found multiple DNA mutations in my dogs tumor p53 growth control gene. This year I looked for mutations in the critical GM-CSF immune cancer fighting gene in my dogs tumor RNA. If my dogs tumor GM-CSF gene was mutated, perhaps her immune system was weakened and could not fight her cancer. If her tumor GM-CSF gene was normal, maybe it was expressed at low levels.</p> <p><b>Methods/Materials</b> A) Genomic Dog tumor DNA/RNA isolation. B) The Dog GM-CSF gene was amplified using polymerase chain reaction (PCR) and ligated into a sequencing plasmid. C) The Dog GM-CSF PCR amplified gene was sequenced. D) The sequence data was analyzed using Sequencher software and electronically compared to the normal dog GM-CSF gene sequence.</p> <p><b>Results</b> I was able to use RT-PCR to amplify the Dog tumor GM-CSF gene and clone it into a sequencing plasmid. The sequence data for my cloned Dog GMCSF gene is clear and strong and shows no mutations.</p> <p><b>Conclusions/Discussion</b> Last year I found multiple DNA mutations in my dogs tumor p53 growth control gene which explained her tumor growth. This year I find no mutations in her tumor immune cancer fighting GM-CSF gene. Her immune system must have been fighting her cancer since GM-CSF was expressed, but maybe not expressed high enough. Perhaps I can put the normal GM-CSF in a high expression plasmid and use it as a cancer fighting vaccine for other Dogs Cancer in the future.</p>	
<b>Summary Statement</b> Clone a cancer fighting gene from my dogs tumor.	
<b>Help Received</b> My Science Advisor, Science Supervisor and Mother all provided useful and appropriate guidance.	