



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title Do the Ends Fortell the End?	
Objectives/Goals Is a variation in the DNA sequence of telomerase, the enzyme that adds telomeres to the ends of chromosomes, responsible for longevity? Based on previous correlations between telomere length and aging, it can be hypothesized that a specific genetic variation in telomerase will be found more frequently in individuals reaching 90 years old.	
Abstract Methods/Materials The mutation was analyzed using Polymerase Chain Reaction (PCR), which makes many copies of the DNA of interest, coupled with DNA sequencing. Approximately 50 children and 50 Senior Citizens over 90 years of age were looked at for this project. General: micropipets, pipettors, microcentrifuge tubes, test tube racks, centrifuge, ice bucket/ice. Polymerase Chain Reaction: DNA, primers, DNA polymerase, deoxynucleotides, tris buffer, water, PE 9700 polymerase chain reaction machine. Gel Electrophoresis: Agarose, tracking dye, gel apparatus, power supply. Gel Staining: pyrex dishes, ethidium bromide stain, water. DNA Sequencing: PCR product, deoxynucleotides, terminator nucleotides, DNA polymerase, water, ABI 3100 DNA Sequencer.	
Results It was found in the over 90 population that there are fewer homozygous A/A and G/G individuals and more heterozygous A/G individuals than expected.	
Conclusions/Discussion When genetic results do not match the Hardy-Weinberg prediction, it can mean there is an advantage to one of the genetic combinations over the others. In this case, it appears that the heterozygous A/G genotype in telomerase is advantageous in some way and is enriched in individuals over ninety.	
Summary Statement A specific variation in the DNA sequence of telomerase, the enzyme that adds telomeres, is found more frequently in individuals reaching 90 years old.	
Help Received I used my parent's laboratory at the UCI School of Medicine. Simin Hakim ran my samples on the ABI 3100 DNA sequencing machine.	