



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Kavita Renduchintala	Project Number S0420
Project Title The Insulin-like Growth Factor Pathway and Breast Cancer Risk in African-American Women	
Abstract Objectives/Goals This study investigated the association between single nucleotide polymorphisms (SNPs) in the Insulin-like Growth Factor Pathway and the increased susceptibility to breast cancer in African-American women. The Insulin-like Growth Factor pathway was chosen specifically because it is known to be associated with cancer risk due to two important phosphorylation cascades it contains: cell proliferation and apoptosis. Single Nucleotide Polymorphisms are variations that occur in the DNA sequence when there is a change of one single nucleotide. These SNPs must occur in at least 1% of an epidemiological population to be considered significant. Methods/Materials DNA Samples were obtained from the Northern CA Breast Cancer Family Registry. TaqMan Assay Plates of 171 DNA samples were created using a Beckman Coulter Robot. ABI and Epoch Probe Cocktails were created and used for the Polymerase Chain Reaction Process. The SNPs in the DNA were then genotyped using the ABI Prism 7900 HT Plate Reader. Gel Electrophoresis was used in cases where the ABI and Epoch probes didn't produce proper results. Linear regression analysis was then performed to determine if the data was statistically significant. Results The SNPs IGFBP5 12239, IGFBP2 33312, and IGFBP2 31341 in a DNA sequence are extremely significant in the increased susceptibility to breast cancer because of the high odds ratios with which they are associated. Odds Ratios represent the increased risk of developing the disease as compared to an African-American women without the SNP. There is a clear correlation between certain SNPs in the IGF Pathway and the development of breast cancer in African-American women. Conclusions/Discussion This study has established the fact that the percentage chance of an African-American woman's susceptibility to breast cancer can be determined by looking at the genotype of certain SNPs in their DNA. There are still questions as to whether certain SNPs are dependent on other SNPs in a gene and whether or not the combination of certain genotypes creates a higher odds ratio of developing breast cancer. Future research will involve the investigation of the full function of the SNPs and genes that are significantly associated with cancer risk. These results can provide clues for strategies to aid in the prevention and treatment of breast cancer.	
Summary Statement Single Nucleotide Polymorphisms in the Insulin-like Growth Factor Pathway are associated with the increased susceptibility to breast cancer in African-American women.	
Help Received Used lab equipment at UCI under the supervision of Dr. Neuhausen and Dr. Ding; Participant in the American Cancer Society High School Research Program	