



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Meera Ganesh	Project Number 35356
Project Title Targeted Therapeutical Mutation for Prevention of Melanoma through Favorable Allele Selection	
Abstract Objectives/Goals The objective was to determine the combination of the alleles of genes responsible for the production of pigment Eumelanin and their role in preventing skin cancer or albinism. Results By using various genetic databases the candidate genes that are responsible for eumelanin production were narrowed down to TYR, OCA2, SLC24A5, SLC45A2. The alleles of each gene was narrowed down after determining each gene. The alleles Rs1126809(G;G), Rs1426654(G;G), Rs1426654(A;G), Rs1426654(G;G) and Rs1800414(A;A) create darker pigmentation, which indicates higher levels of eumelanin production and better prevention of skin cancer. Conclusions/Discussion Eumelanin is responsible for the darker skin colors. It is made of polymers of dihydroxyindole carboxylic acids. Eumelanin can protect the cells against radiation in two ways: by absorbing or scattering UVR rays. Eumelanin is made up of tiny crystals each with various absorption capabilities. A larger range of crystals gives the skin more absorption capabilities by allowing the pigment to absorb a broader spectrum of light. In melanoma (skin cancer), UVB rays are able to penetrate the walls of melanocytes and cause structural damage to DNA. Penetration of UVA rays can induce the generation of reactive oxygen species which also can greatly inhibit proper cell function. By introducing the alleles discovered through genetic mutations, the bodies chances of getting skin cancer go down.	
Summary Statement This project determines an optimal combination of alleles that reduce the bodies risk of getting skin cancer.	
Help Received	