Family-based analysis of *TYRP1* gene polymorphisms in vitiligo

Catherine Rayburn[1], Hua Li PhD[1], Margaret R. Wallace PhD[1,2]

[1]Department of Molecular Genetics and Microbiology, [2]UF Genetics Institute, University of Florida, Gainesville, FL

Introduction

Vitiligo occurs when the immune system attacks melanocytes in the skin, causing loss of pigment ("white" spots). The main areas affected are the hands, knees, feet, elbows, mouth and eyes. There is no cure, just light therapy that must be maintained and is rarely completely effective. Vitiligo has profound psychosocial effects, but minimal physical problems. Our lab is working to identify susceptibility genes, based on the observation that vitiligo can run in families. Tyrosinase-related protein 1 (TYRP1), an enzyme involved in melanin synthesis, is a candidate vitiligo gene. This project involves genotyping three single-nucleotide polymorphisms (SNPs) in *TYRP1* (rs 2733832, rs 2762462, and rs 1408799) in affected families to look for co-segregation of one allele with the presence of vitiligo. This will provides evidence about whether TYRP1may be a vitiligo susceptibility gene.

Methods

PCR primers were designed to amplify fragments containing SNPs rs2733832, rs2762462, and rs1408799. After PCR amplification, Sanger sequencing of the PCR products is used to genotype SNPs rs2733832 & rs2762462. For rs1408799, a restriction enzyme digest will be used for genotyping. DNA samples from seven families with vitiligo are being genotyped for all three SNPs.

Results

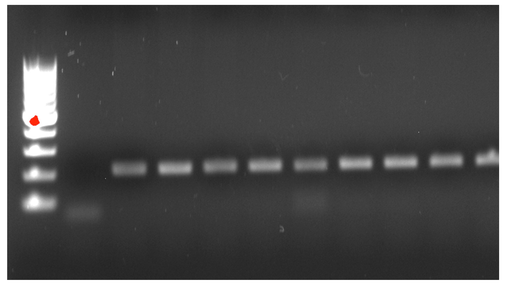

Figure 1. Photo of quality control agarose gel electrophoresis checking PCR products from some family DNAs (lanes 3-11). Lane 1 shows the molecular weight ladder. Lane 2 shows the negative control. PCR products that pass quality control are subjected to genotyping.

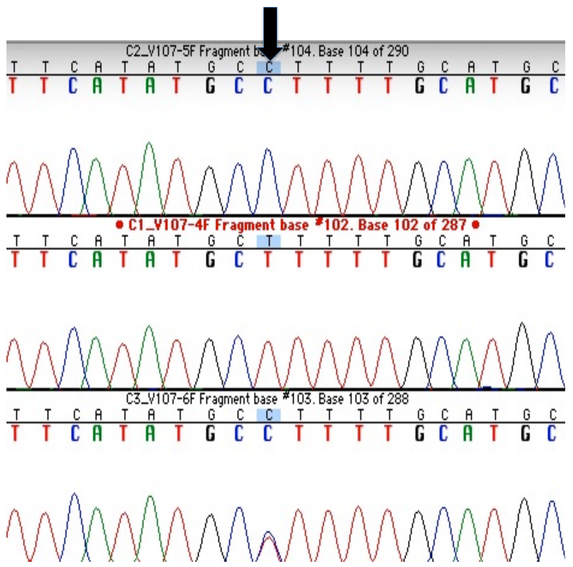

Figure 2. Sequencing chromatograms from rs2733832 for three members of family 107. The arrow indicates the polymorphic base. The top line shows a CC homozygote, the 2nd line shows a homozygote for the T allele (TT), and the bottom line shows a CT heterozygote.

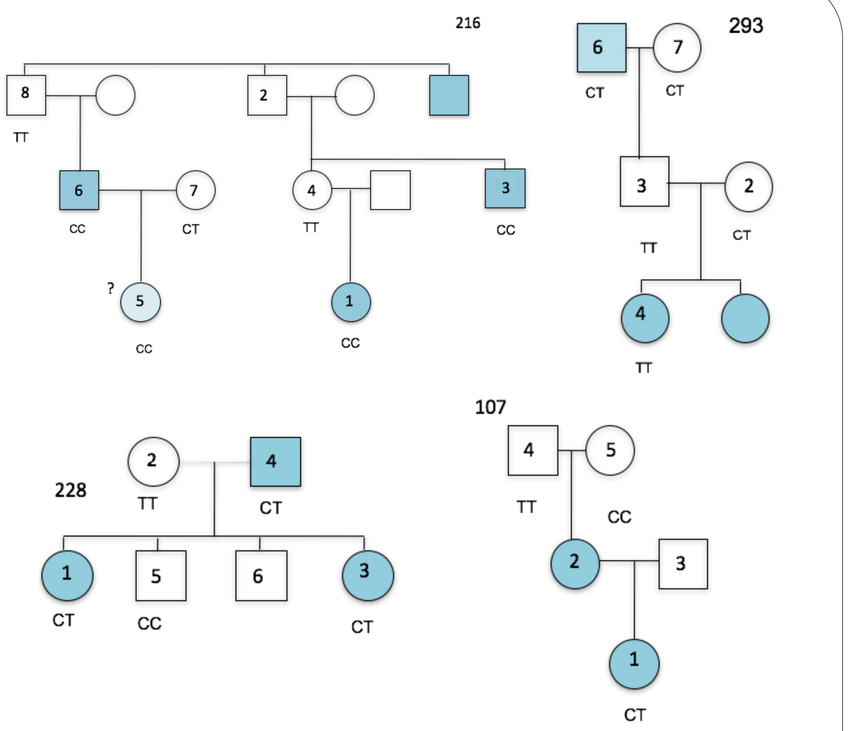

Figure 3. Pedigrees of four of the families under study. Blue filled symbols represent individuals who have vitiligo, unfilled is unaffected. Symbols with a number indicate those for whom we have DNA. The genotypes observed are for rs2733832.

Conclusions

These families have been genotyped for rs2733832, with rs2762462 and rs 1408799 still in progress. After all three polymorphisms have been genotyped, genotypes will be placed on the pedigrees and evaluated for whether there are any alleles or haplotypes that are segregating with vitiligo in one or more families. This will evaluate *TYRP1* as a potential vitiligo susceptibility gene.