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*Polymerase Chain Reaction Analysis on Gene GLI3, Causing Polydactyly, in 3 DNA Generations*

The purpose of this project was to determine how the gene that causes polydactyly, GLI3, changes from generation to generation. I hypothesized that if I collect cheek samples from four individuals with polydactyly and two individuals without the genetic condition and analyze them with restriction enzymes specific to sites within the GLI3 gene, then I would be able to detect differences among these individuals from one generation to the next. This experiment involved isolating the DNA from cheek cells in order to prepare it for later use. After I isolated the DNA, I put the samples into the Absorbance Spectrophotometer to look at the DNA concentration. I made and ran an electrophoresis gel with the sample to ensure that I had DNA. I amplified the DNA using PCR to see if the enzymes would cut the DNA in the intended places. The data collected did not support my hypothesis. The restriction enzymes that I chose did not cut the DNA in the intended places. They digested the DNA, but I do not think that they digested long enough in order to see the intended results. These findings led me to believe the two enzymes I chose do not cut the DNA in the intended places. In next year's project, I will use different restriction enzymes and a longer digestion period.