CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34406

Project Title
The Study of the Inheritance of Syndactyly

Abstract

Objectives/Goals
My project was to determine whether the gene for Syndactyly Type 1(cutaneous webbing of second and third digits of hands) to chromosome 2q34-2q36 can skip a generation of phenotypic inheritance by epigenetics.

Methods/Materials
Determination of who phenotypically had inherited Syndactyly Type 1 in my paternal family was conducted. I needed to find a primer for the 2q34-35 chromosome in which Syndactyly Type 1 is localized. Failing to do so, I focused on composing a pedigree chart of the last four generations of my paternal side by distinguishing who phenotypically inherited Syndactyly Type 1 or not. Research was then conducted to analyze the gene of Syndactyly Type 1 in regards to the autosomal dominate trait turning on or off allowing for two generations to be skipped on my paternal side of the family.

Results
Looking back four generations on my paternal pedigree, two generations were skipped showing no phenotypic signs of Syndactyly Type 1. My paternal great grandparents showed no phenotypic signs of any form of Syndactyly (first generation skipped). My paternal grandfather inherited Syndactyly Type 1, showing webbing phenotypically between his third and fourth finger of his left hand as well as my grandmother showing webbing phenotypically between her third and fourth toes of her left foot. My paternal grandfather had five male offspring through intermarriage (first cousin). All five sons showed no forms of Syndactyly phenotypically. My father being one of the sons got married in a non-inter marriage passing Syndactyly Type 1 to me and my sister on both of our hands.

Conclusions/Discussion
Syndactyly is an autosomal dominant limb malformation, characterized phenotypically by the webbing being either simple or complex and complete or incomplete. My research indicates that through epigenetics this autosomal dominate gene turned off for the generations in which it was skipped and subsequently turned on for the generations that showed Syndactyly phenotypically.

Summary Statement
My project is about my paternal family pedigree and how the inheritance of Syndactyly skipped two full generations due to epigentics and the gene linked to Syndactyly being an autosomal dominate trait.

Help Received
My older sister Sofhia Samimi mentored me throughout my entire project and my AP Biology teacher Mrs.Acquistapace