

## Pedigree Project Analysis

### Successes and Problems

My family is probably one of the hardest family's to do a pedigree project on because they live all the way in India. India has a different timezone than the United States, so when I fall asleep it is the time they wake up and the time I wake up, they go to sleep. This was one of the most difficult problems I faced when making this pedigree. I have to find the correct time in order for me to talk to them. The success I had with this project is that I found one day to talk to my family on my mom's side. They had no trouble when I asked them "Can you roll your tongue, and can I see your chin, and.....". Even though my grandparents didn't really understand what I was saying, like what hitchhiker's thumb was, they tried to help as much as they could. Luckily my grandparents, my aunt, my uncle, and my cousins were all in the same place so I didn't need to call everyone one by one. That is one more success that occurred during the project.

### Surprises/Discoveries

During the creation of the pedigrees, I was very surprised with the results. I discovered many things about them. When I was interviewing my grandfather from my mom's side, he and I were the only ones that had a dimple chin, which is the most surprising trait I've discovered. When I was finding out the blood types for my dad's side, I was surprised that most of my family has blood type A rather than blood type O. For the tongue rolling on my mom's side, I didn't expect so many people to do it. I thought only 3 to 4 can do it, but it turns out 3 to 4 people can not do it. Lastly, for the hitchhiker's thumb, I wasn't so surprised but at the same time I was surprised. I did believe that more people in my family would have straight thumbs than hitchhiker thumbs, but not that many hitchhiker thumbs. I thought there would be 2 in my family but there were really four. This didn't really surprise me but it was a fun discovery.

### Analyzing the genetic traits on my mom's side

On my mom's side the traits I did were tongue rolling and dimple chin. For the tongue rolling, being able to tongue roll is dominant, and not being able to is recessive. Both my grandparents are able to roll. Both of my grandparents are heterozygous dominant ( $Rr$ ). It was passed on to my aunt and my mom. My aunt is able to roll her tongue but my mom is not able to. My mom is homozygous recessive ( $rr$ ). My aunt married my uncle who can not roll his tongue. Therefore my uncle is homozygous recessive ( $rr$ ). My aunt has a son who is not able to roll his tongue, but the daughter can. My aunt is heterozygous ( $Rr$ ) because it is the only possible option if one of her kids can roll and one cannot. The son of my aunt has to be homozygous recessive ( $rr$ ) and the daughter has to be heterozygous ( $Rr$ ). My mom married my dad who is able to tongue roll. I am able to roll my tongue and my brother is not able to. This means my dad has to be heterozygous ( $Rr$ ), I am heterozygous ( $Rr$ ), and my brother is homozygous recessive ( $rr$ ). Now, for the dimple chin, having a dimple chin is recessive while not having one is dominant. Only my grandfather has a dimple chin, not my grandma. Therefore my grandfather is homozygous recessive ( $dd$ ), and my grandmother is homozygous dominant ( $DD$ ). My aunt and my mom both don't have dimple chins. This means both have heterozygous ( $Dd$ ). My aunt married a man who has no history of cleft chins, so he must be homozygous dominant ( $DD$ ). Their kids both don't have dimple chins meaning one of them could have homozygous dominant ( $DD$ ) and one of them has heterozygous ( $Dd$ ). My mom and my dad both don't have dimple chins. I have a dimple chin while my brother doesn't. This means my dad has to be heterozygous ( $Dd$ ), I must be homozygous recessive ( $dd$ ) and my brother is homozygous dominant ( $DD$ ).

### Analyzing the genetic traits on my dad's side

On my dad's side, the traits I did were blood type and hitchhiker's thumb. For blood type, the most common blood type would be dominant, which is blood type A. My grandfather has blood type B and my grandmother has A. My dad has blood type A and my uncle has blood type AB. My mother has blood type O. I am blood type A and my brother is blood type O. Amrutha, my cousin, is blood type AB, and Harshita, my cousin, is blood type A. Therefore, my grandfather would be heterozygous B ( $I B i$ ), and my grandmother has to be heterozygous A ( $I A i$ ). Then my dad would be heterozygous A ( $I A i$ ), and my mom will be blood type O(ii). My uncle would be blood type AB ( $I A I B$ ) and my aunt would be heterozygous A ( $I A i$ ). Lastly, Amrutha would be blood type ( $I A I B$ ) and Harshitha would be heterozygous A ( $I A i$ ). For hitchhikers thumb, having a straight thumb is recessive, and hitchhikers thumb is dominant. My grandfather has a straight thumb, and my grandmother has a hitchhiker's thumb. My dad has a hitchhiker's thumb, and my uncle also. My mom has a straight thumb. I have a straight thumb, and my brother has a hitchhiker's thumb. My aunt has a straight thumb. Amrutha and my Harshita both have straight thumbs. My grandfather has to be homozygous recessive( $t t$ ), and my grandmother is heterozygous ( $T t$ ). My dad and my uncle are both heterozygous ( $T t$ ). My aunt and my mom are both homozygous recessive ( $t t$ ). I have homozygous recessive( $t t$ ), and my brother has heterozygous ( $T t$ ). Ending, Amrutha and Harshita both have homozygous recessive ( $t t$ ).

## Hypothesis/ Conclusion

I can conclude that a pedigree can help us notice what traits have been inherited or if they have been inherited. For example, you can see if you inherited a common blood type in your family or if you inherited a recessive blood type. You can also see who in your family has the same trait as you and how rare it is. For instance, only me and my grandfather have a dimple chin. The rest of the family don't have it, or they are carriers. Pedigrees are very useful in daily life if you need to know the possible traits you could have.

Work Cited:

- I interviewed my Grandfather: Only from my dad's side

Grandmother: Both sides

Aunt: Both sides

Uncle: Both sides

Cousins: Both sides

My mother

My father

My brother

- No photographs were taken.
- I used Mrs.Louidor's chart to find out if a trait is dominant or recessive