

THE GENEOLOGY OF EYE COLOUR

I got interested in the biology of eye colour when I realised that my father, and both of my siblings have blue eyes, but my mother has brown eyes. I was surprised that none of us had brown eyes. I did a little bit of further family research, and discovered that my grandparents on my father's side had one set of blue eyes and one set of brown eyes; and on my mother's side, one set of blue eyes, and one set of green eyes. To make things even more mysterious, none of my mother's three siblings have brown eyes. So, my mother is the only person in three generations of her direct family to have brown eyes. I wanted to understand how it worked.

It turns out that the genetics of eye colour is relatively complicated. Most eyes are either brown or blue. In fact, it is estimated that somewhere between 55% and 80% of the world has brown eyes, around 8-10% have blue eyes, 5% have hazel or amber eyes, 2% have green, and 1% grey.



Your eye colour is determined by the amount of melanin in your iris. The more melanin you have, the darker your eyes will be. Blue eyes have the least amount of melanin (and can be quite sensitive to sun), while brown eyes have the most (and are the most resilient to light). Green and hazel eyes are somewhere in the middle. Melanin is a pigment that provides colour to your hair, skin and eyes. It's produced by cells called melanocytes. The amount of melanin in your iris comes from your genes, and your eye colour is usually passed down from your parents.

According to some scientists, it is believed that anyone with blue eyes can trace their roots back to an individual person who lived thousands of years ago. This person carried a gene mutation that resulted in the production of lower levels of melanin. As time went on, this mutation was passed down through the generations, and today we see it in people all over the world.



THE BIOLOGY OF EYE COLOUR

Whatever your eye colour is, it will be made up of two different genes, which make three different combinations:

- Bb | BB | bb

The upper case 'B' is brown, and is the dominant gene, and the lower case 'b' is blue, the recessive gene. As brown is a dominant gene, if you have just one B colour gene, your eyes are going to be brown (or versions of brown, like hazel or green). To get blue eyes, you have to have two b colour genes, because it is a recessive colour.

A child will inherit one of each of their parent's colour genes, and you never know which one, until the child is born. If both parent have blue eyes, the children will definitely have blue eyes, because you need two b colour genes to have blue eyes, and so whichever gene the child takes, it will always be blue.

MY FAMILY'S EYE COLOURS

So, in the case of my parents, we will all have taken a b gene from my father (with his blue eyes), and my mother must have had a b recessive gene (alongside her B), and she ended up giving all of us her b gene. Which is why all of our eyes are blue. Based on this, I have pulled together a family tree of eye colours.





Marnie R (bb)