



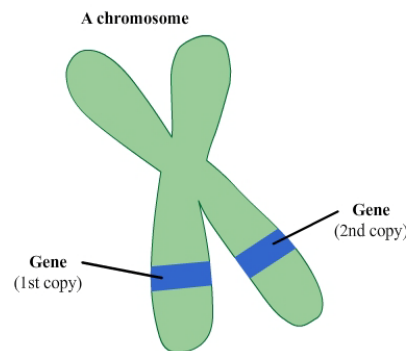
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## Dominant Inheritance

A handful of concepts

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We have 22 pairs of chromosomes and a pair of sex chromosomes (XX for female and XY for males). Genes are located in a specific position in a chromosome. There are two copies of each gene, one is inherited from the mother, and the other copy is inherited from the father.



Sometimes a gene can be altered by a genetic change (also known as a **mutation**). This can cause a disease or a particular genetic condition.

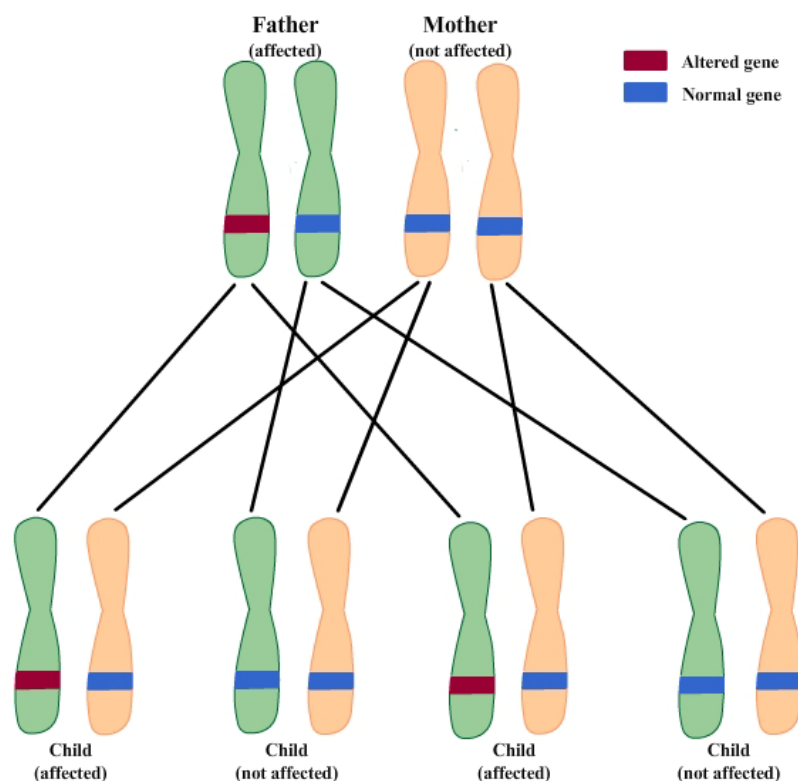
“**Dominant**” means that a mutation in only ONE copy of the gene is enough for a person to have a disease or a genetic disorder.

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### What happens when having children?

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When a parent has a genetic change in a dominant gene, there is a 50% chance that any child of that parent will also inherit the genetic change, and therefore at sometime in their life may develop the condition. Males and females are equally likely to inherit the genetic change from a dominant gene NOT on the sex chromosome.



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### *What is reduced penetrance?*

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Penetrance refers to the chance of you developing a known condition when you have a genetic change. This will be different for each known genetic change. Your geneticist can explain this in relation to your condition.

A condition is said to have **reduced** (or incomplete) **penetrance** when the symptoms of the condition are not evident in a person known to have the genetic change. For example, some individuals have an increased risk of developing breast and/or ovarian cancer. This is due to a genetic change in a particular gene. Some people carry the genetic change but never develop any of the associated cancers. The fact that a person carries a genetic change means that this person may develop cancer during his/her lifetime. Doctors cannot predict if and when this will happen.

Environmental and lifestyle factors can influence the expression of a genetic disease or condition. For example people that carry a genetic change for lung cancer are more likely to develop the condition if they smoke.

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### *What does variable expressivity means?*

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A disorder caused by a genetic change can have a range of different symptoms, and these symptoms can be mild or more severe. Variable expressivity refers to the fact that a mutation in the same gene can express differently in each individual.

For example the Marfan syndrome, a condition caused by a genetic change in a particular gene, can have several kinds of symptoms with different features. Some people can only show mild symptoms, like long arms, fingers and legs, other people can have more severe symptoms like defects of the heart.

As well as penetrance, variable expressivity is influenced by lifestyle and environmental factors.