North East Thames
Regional Genetics Service

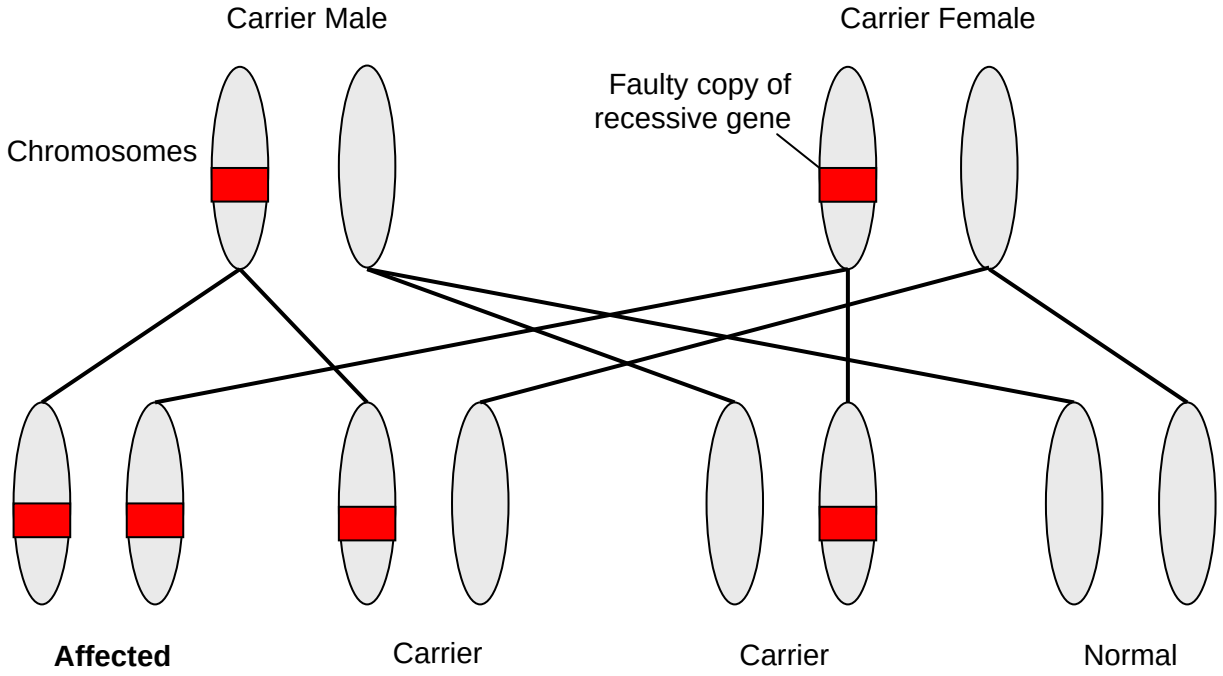
Recessive Inheritance

Genes consist of chemical 'instructions', which determine how our bodies develop and function. They are inherited from both of our parents. All the genes necessary for development (about 25,000 pairs in total) are arranged along thread-like particles called chromosomes and are contained within the single cell that is made when the egg and the sperm fuse at conception. We inherit an entire set of genes from our mother in the egg and an entire set from our father in the sperm so a baby therefore starts off life as a single cell containing 25,000 pairs of genes; one gene of each pair has come from the mother, and the other of the pair from the father.

In many cases, if one copy of a gene is altered (and encodes the 'wrong' instruction) there may be no effect as long as the other copy is normal. The change is therefore weak or 'recedes' into the background. The individual is said to be a 'carrier'.

We all carry four or five such recessive changes in our genes and this may only come to light if we have a child with a person who also carries an alteration in the same gene (for instance, cystic fibrosis gene or a gene for hearing). When two carriers of changes in the same gene have children together, each parent will either pass on their normal chromosome, containing their normal copy of the gene or the other chromosome, which contains the gene with the change in it. The outcome will depend on which genes the child inherits. If the child inherits two copies of the gene containing changes, then they will be affected but if they inherit at least one copy of the normal gene, they will be healthy.

Recessive Inheritance (both parents carriers)



Each time two carriers have a child, there is a 1:4 chance that the child will inherit two genetic changes and will be affected. There may be no family history (that is, the parents are normally healthy because they are both just carriers). People with recessive conditions usually have healthy parents and grandparents and may, or may not, have affected brothers and sisters.

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