

DNA in the Garden – DNA: A Matter of Size and Sequence

One complete copy of the DNA of an organism, including bits that don't code for anything, is called its **genome**. Measuring the total amount of DNA in different genomes has revealed some big surprises

Quantity can have major consequences

The amount of DNA (or C-value) in plants differs dramatically between species. Some fritillaries and lilies have hundreds of times as much DNA in their genomes as *Arabidopsis* or the horse chestnut tree (*Aesculus hippocastanum*).

Large amounts of DNA carry high inherent biological costs. What do you think these are?

Do you think that there may be a limit to the size of a genome?

How can genome size help to predict plant behaviour?

Why might some genomes (e.g. the human one) contain fewer genes than expected?

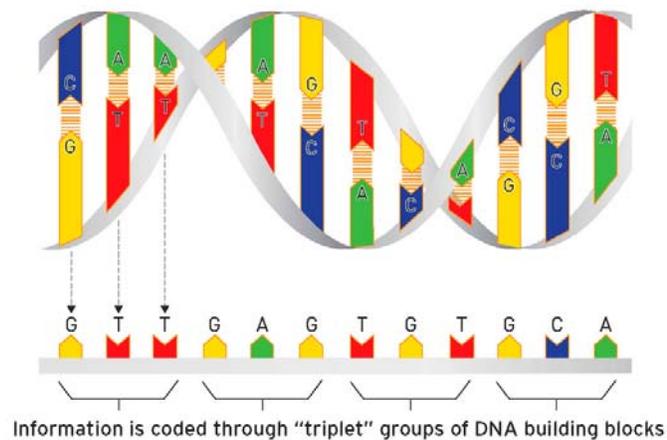
Is the amount of DNA always related to the number of genes, and if not what else is it related to?

DNA Structure and Function

Why was the discovery of the structure of DNA 50 years ago so important?

Relatively recently, researchers have found that there are tiny structural differences along the DNA double helix.

Why do you think that these are important?



Fascinating facts!

Some tobacco plants contain stretches of DNA from viruses, incorporated millions of years ago during evolution – a sort of natural genetic modification.

Some stretches of DNA can naturally hop from one place in the sequence to another. In doing so, they can disrupt the functions of genes, resulting in visible differences in the plant. This happens a lot in the snapdragon (*Antirrhinum*), where it can affect flower colour. The tea rose (*Rosa mundi*) gets its characteristic flecking from DNA jumping in to genes for petal colour and disrupting them. A similar effect can be seen in some corn cobs.



Antirrhinum sp.