

## The Daily Science News

*Genetic Modification...  
Could we? Should we?*

16<sup>th</sup> May 2013

### The Facts...

Genetically modified cotton has been grown commercially in Australia since 1996.

Cottonseed from genetically modified cotton is crushed to make cotton seed oil, used for cooking.

Genetically modified canola was modified for herbicide tolerance and was approved for usage in Australia in 2003.

Canola is used in margarine spreads and as an ingredient in tinned and snack foods.

<http://www.sbs.com.au/news/article/1216977/Factbox-GM-foods-in-Australia>



### The Genetic Dilemma

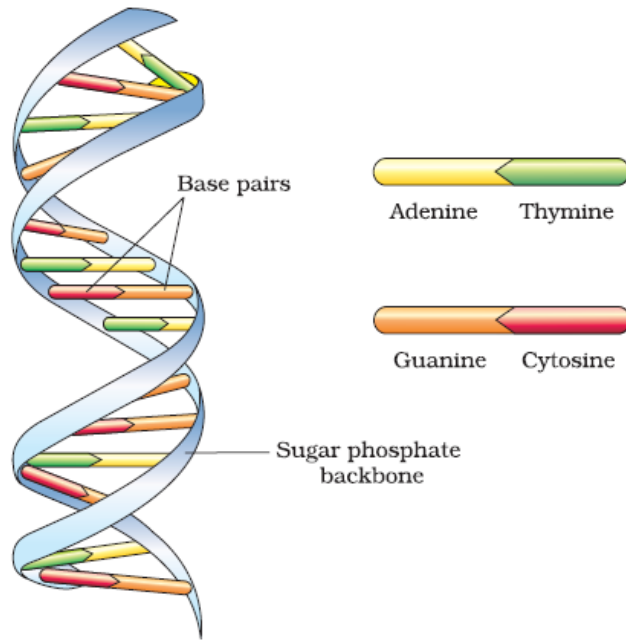
Young artist Natalie Elliott has created controversy with her latest piece of work “Beastly Instincts” which she has used to challenge the latest revolutions in genetic engineering and human GMO’s.

Ms. Elliott argues that the creations of GMO’s represent an unnatural world, but it can be argued that GMO’s are helping to increase the potential of humans. Can you imagine running as fast as a cheetah? Or having the strength of a bull?

With the help of gene technology, an animals DNA can potentially be transferred into a human, in order to create both physical and mental advantages.

To understand the process of creating GMO’s, it is important to first look at the scientific theory.





**Figure 6.3** DNA double helix



## DNA. What is it? How does it affect GMO's?

DNA stands for Deoxyribonucleic Acid. DNA can be found in the nucleus (the brain) of cells in all living things. The building blocks of DNA are known as nucleotides. They are made up of a phosphate group, a deoxyribose sugar and one of four nitrogen rich bases. The four nitrogen rich bases are Adenine, Thymine, Cytosine and Guanine. With these bases comes the rule of complementary base pairing. This means that only Adenine can pair with Thymine and Cytosine can only pair with Guanine. The order that these bases pair with each other will determine the genetic code.

There are two strands in DNA. One strand contains the code while the other is complementary. So structurally, a DNA molecule looks like a twisted ladder with the two strands and the bases connecting them, this is referred to as a double helix structure.

The second factor of GMO's are the genes found in DNA. They are responsible for making a protein, which will determine the characteristics an organism may have. An example of this is eye colour.

The third is chromosomes. Chromosomes are long, thin thread-like structures that are made up of DNA. Human cells contain 23 pairs of chromosomes and have about 4000 genes across them.

DNA is the component that is placed into an organism for it to become a GMO.





## Gene technologies And how they are being used today

### Mad Science... The Genetic Modifications

#### Venomous Cabbage:

Scientists have recently taken the gene that programs poison in scorpion tails and combined it with cabbages. Why would they create such a thing? They created it to limit the pesticide use in the vegetables and to keep caterpillars from eating them. The toxin however, has been modified so it isn't harmful to humans.

<http://www.mnn.com/green-tech/research-innovations/photos/12-bizarre-examples-of-genetic-engineering/venomous-cabbage>

Gene technology is the term given to a range of activities concerned with modifying genes and transferring genes to new hosts. It offers vast benefits for human health and disease prevention. This is the topic being portrayed in Ms. Elliott's artwork. She has shown the things that could potentially go wrong if we use gene technologies to implant animal DNA into humans. Although at this point in time scientists are only able to implant one animal DNA sample into a human, in the future with new technologies we could be able to implant multiple samples.

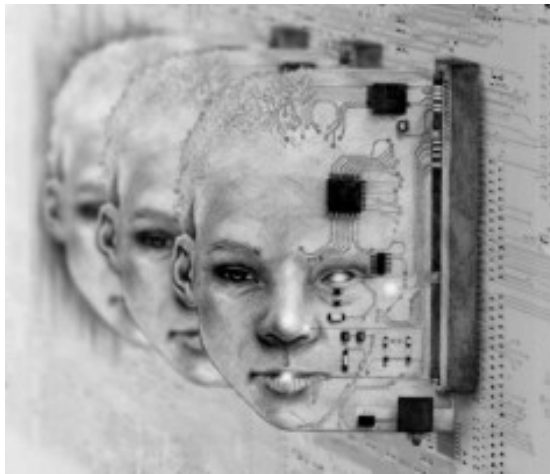
Scientific research shows that GMO's can benefit humans, and not just with the implanting of animal DNA. We all find and buy GMO's in the supermarkets everyday, even if we are unaware of it. Canola Oil and other crops for example, have been genetically modified so farmers no longer have to use pesticides to protect them from bug infestations, therefore not leaving poisoning or harming residues from the pesticides in our food. The question is should those products be labeled? Should people have the right to know what they are putting into their bodies? Ms. Elliott believes so.

In other cases GMO's are not beneficial to society. In 2007, South Korean scientists altered a cat's DNA to make it glow in the dark. This, people believe was just a case of doing it because the scientists could, not because it would benefit either humans or the cats.

Many believe that even though there are benefits to genetically modified organisms, it being used in humans is inhumane and unnatural.

On the other hand it must be considered that genetic engineering in humans could have a positive affect in society. With new technology we can eliminate all genetic problems in humans, the kind of things that cause disease and disability. Also we could have the chance to make ourselves smarter, stronger and healthier.

In Ms. Elliott's opinion genetic modification on humans can be both good and bad, it just depends on the



circumstances. If it can cure disease and make someone's life happier and healthier, then people should use the technology! But if it used to modify someone just to make them smarter or prettier, a parent modifying a child for example,

then Ms. Elliott believes that it shows how self-conscious people are, how they want to "play god" and make their children and themselves perfect. How would this affect the people who aren't genetically modified? Would they feel smaller against someone who was made to be flawless? She believes that it should be used, but for reasons that make people equal to each other, not superhuman and more advanced than the unaltered people of society.

<http://teenink.com/opinion/all/article/71522/Genetic-Engineering/>

## Quotes about GMO's

"The position I took at the time was that we hadn't really examined any of the potential environmental consequences of introducing genetically modified organisms."

***Jeremy Rifkin,  
American economist,  
activist and political  
advisor.***

"There's almost no food that isn't genetically modified. Genetic modification is the basis of all evolution."

***Nina Fedoroff,  
American professor  
in biotechnology.***

"As a scientist, actively working in the field of GMO's, I find that it is very, very unfair to use our fellow citizens as guinea pigs."

***Arpad Pusztai, PhD***

"If you put a label on genetically engineered food you might as well put a skull and crossbones on it."

***Norman Braksick,  
president of Asgrow  
Seed Co. March 7<sup>th</sup>,  
1994.***

<http://www.brainyquote.com/quotes/keywords/genetically.html>

<http://www.thedoctorwithin.com/gmo/genetically-modified-foods-alert/>