

Genetic engineering 10213

Engineering



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Genetic engineering is a laboratory technique used by scientists to change the DNA of living organisms.

DNA is the blueprint for the individuality of an organism. The organism relies upon the information stored in its DNA for the management of every biochemical process. The life, growth and unique features of the organism depend on its DNA. The segments of DNA which have been associated with specific features or functions of an organism are called genes. Molecular biologists have discovered many enzymes which change the structure of DNA in living organisms. Some of these enzymes can cut and join strands of DNA. Using such enzymes, scientists learned to cut specific genes from DNA and to build customized DNA using these genes. They also learned about vectors, strands of DNA like viruses, which can infect a cell and insert themselves into its DNA. With this knowledge, scientists started to build vectors which incorporated genes of their choosing and used the new vectors to insert these genes into the DNA of living organisms. Genetic engineers believe they can improve the foods we eat by doing this. For example, tomatoes are sensitive to frost. This shortens their growing season. Fish, on the other hand, survive in very cold water. Scientists identified a particular gene which enables a flounder to resist cold and used the technology of genetic engineering to insert this 'anti-freeze' gene into a tomato. This makes it possible to extend the growing season of the tomato.

The marketing of genetic engineering inspires visions of perfect health, long life, and miracle foods.

The reality is that these claims are often completely unsubstantiated and sometimes simply wrong.

Claim: Genetic engineering is necessary to feed the world.

Fact: Hunger in the world is caused by war, drought, and poverty, not by lack of supply.

Claim: Genetic engineering will help developing countries.

Fact: Biotech companies plan to protect their seed patents through the terminator technology. A terminator seed will grow, but the seeds it produces are sterile. Any nation that buys these seeds will swiftly lose any vestige of agricultural self sufficiency. The lives of the people will then be in the hands of the biotech companies, for they alone will have seeds that can grow.

Claim: Genetic engineering will reduce the use of herbicides.

Fact: Genetic engineering promotes herbicide resistant crops. This allows the farmer to use more herbicide. The development of Roundup Ready(tm) crops is a vehicle for building sales of Roundup(tm).

Claim: Genetic engineering will reduce the use of pesticides.

Fact: Genetic engineers create crops that produce their own pesticides. The outcome is a persistent concentration of pesticides over vast acreages. Some of these crops are actually classified as pesticides by the EPA.

Claim: Genetic engineering is environmentally friendly.

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Fact: The increased quantities of herbicides and pesticides noted above is one strike against this claim. Pollen from genetically engineered crops can be transferred to cultivated and wild relatives up to a mile away. This threatens the future of organic crops. It can pass herbicide resistance genes from GE crops to weedy relatives, necessitating the development of more herbicides. Also, the huge areas of genetically identical crops will influence the evolution of local pests and wildlife, and through the food chain, the whole ecology.

Claim: Genetically engineered foods are just like natural foods.

Fact: There is no natural mechanism for getting insect DNA into potatoes or flounder DNA into tomatoes. Genetically engineered foods are engineered to be different from natural foods. Why else all the patents? This claim is empty sales talk.

Claim: Genetic engineering is simply an extension of traditional crossbreeding.

Fact: Crossbreeding cannot transfer genes across species barriers. Genetic engineering transfers genes between species that could never be crossbred. Also, crossbreeding lets nature manage the delicate activity of combining the DNA of the parents to form the DNA of the child. Genetic engineering shoots the new gene into the host organism without reference to any holistic principle at all.

Claim: Genetic engineering is safe.

Fact: Safety comes from accumulated experience. In the case of genetic engineering, there has not been the time or the public debate essential for accumulating sufficient experience to justify any broad claim to safety.

The technique for inserting a DNA fragment is sloppy, unpredictable and imprecise. The effect of the insertion on the biochemistry of the host organism is unknown. The effect of the genetically engineered organism on the environment is unknown. The effect of eating genetically engineered foods is unknown. There is no basis for meaningful risk assessment. There is no recovery plan in case of disaster. It is not even clear who, if anyone, will be legally liable for negative consequences.