

Genetic Engineering

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Genetic Engineering is the quickly developing field that involves modifying DNA. By isolating, manipulating, and reintroducing DNA into cells, scientists are finding ways to create new physiological and physical characteristics.

To carry out this “gene splicing”, first the section of the DNA containing the gene must be isolated and then cut out. The sequence is then modified as needed. Then it is spliced into a different DNA segment or into a vector (organism that doesn’t cause disease itself but rather spreads it) to transform the living cells. Ligases, which are enzymes that form a new chemical bond to join two molecules, and restriction enzymes, which can cut double-stranded DNA, can be very useful in the gene splicing process as well.

The ability to modify DNA has great potential benefits. It could give humans the ability to cure disease, increase immunity of people to virus, introduce new traits, enhance existing traits, create different ways to produce crops, and much more. Already it has been used to develop human insulin, hepatitis B vaccine, and crops. We may not even realize it, but many foods that we eat on a regularly basis are made with genetically modified crops.

There are several different categories of genetic engineering. Somatic cell gene therapy involves modifying genes of a person without affecting the next generation. An example of this would be modifying the genes of a diabetes sufferer. Germ-line therapy is much more extreme and involves modifying the DNA of eggs and sperm, meaning the genes would pass down to future generations. Eugenic genetic engineering is by far the most radical and involves changing germ-lines to improve

racess of people. (Is this so different from Hitler’s vision of the perfect world?).

The idea of genetic engineering raises many ethical questions. It is going against what is natural, and many claim it is “doing the work of God”. With regards to medical care, who is to say who deserves this kind of treatment and who doesn’t? If a couple cannot afford to pay to “modify” their embryos, is it fair for their child to have to compete with the child of a wealthy couple that has been “modified” to be superior? Will this technology be used to transform warfare? There are also many health risks. Germ-line gene therapy has the potential to contaminate future generations and the effects could be irreversible. Genetically engineered crops are dangerous because since they are designed to withstand herbicides, their pollen and seeds could contaminate wilderness, creating “superweeds”, “superbugs”, and cause pollution. Many manufacturing companies don’t even label products that are genetically engineered so consumers are unaware.

The possibilities of genetic engineering technologies are mind-boggling, and though it will undoubtedly be very powerful, scientists must tread with caution for the good of the human race.

References

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