

Task: Write an essay on legal and ethical issues in the matter of genetic engineering.

Topic: Legal and Ethical Issues in Genetic Engineering

Type: Exploratory Essay

Length: 10 pages

Formatting: N/A

Requirements: Explore the legal and ethical boundaries that are threatened by experiments in genetic engineering.

Legal And Ethical Issues in Genetic Engineering.

Name:

Institution:

Legal and Ethical Issues in Genetic Engineering

Introduction

Genetic engineering is also known as genetic modification. It is the process by which a new type of DNA is manually added to an organism, or the manipulation or modification of the genome of an organism by use of biotechnology. The main goal of genetic engineering is to add a new gene into the target organism, to enable it to mimic the trait encoded by the inserted gene. Genetic engineering involves finding an organism that naturally contains the desired trait and extracting the DNA from which the desired gene is located and copying it. This process is known as gene cloning (Council for Responsible Genetics). The extracted gene may be slightly modified before insertion into the target organism. The new gene is known as transgene. The transgene is inserted into the cells of the recipient organism, a process known as transformation. Genetic engineering is different from traditional breeding because genetic engineering involves manually moving genes from one organism to another, while in traditional breeding genes move through crossing or mating. This essay discusses human genetic engineering, and the legal and ethical issues surrounding human genetic engineering (Isasi, Knoppers, & Nguyen, 2006).

Human genetic engineering

Association of Reproductive Health Professionals defines Human genetic engineering (HEG) or Human Genetic Modification (HGM) as a process through which medical professionals and scientists alter the DNA or genetic makeup of a living human cell. HGE is used to fix genetic complications and genetic genes that cause diseases. In order to alter the genes, a new gene is inserted into an organism resembling a virus, which penetrates a cell and inserts a new gene into the targeted genome (Council for Responsible Genetics). HGM utilizes two applications to alter genes: germline and somatic. Germline engineering targets the genes in

embryos, sperm, and eggs, in early developmental stages. The human genetic modifications affect every cell created in the developing embryo. Germline modifications are passed from generation to generation. Somatic engineering targets certain genes in specific tissues or organs without any interference with the genes in sperms or eggs. The aim for somatic engineering is to cure or treat an existing condition, and does not alter genetic makeup (Haga & Willard, 2006). Compared to somatic, germline engineering is more controversial since it affects the future of reproduction, because germline modifications are passed from generation to generation (Isasi et al., 2006).

Cloning is considered a third method of HGE (Annas, Andrews, & Isasi, 2002). The US Department of Energy genomics divides cloning into three: therapeutic cloning, reproductive cloning, and DNA cloning or recombinant DNA technology (Bledrzycki, 2005). Therapeutic cloning or embryo cloning involves producing human embryos to be utilized in scientific research. Reproductive cloning is the generation of an organism possessing similar nuclear DNA as another organism. DNA cloning involves transferring a DNA part from an organism to a genetic element with self-replicating abilities to enable the DNA to undergo self-replication in a foreign host cell (Annas et al., 2002).

HGE has various advantages. It has the capacity to eradicate the development of disease processes. The gene mutations can arrest diseases like cystic fibrosis, cardiac diseases, and Alzheimer's disease. Genetic Engineering could lead to detection of people that are genetically prone to certain hereditary diseases, and prepare them to deal with the expected outcomes (Bledrzycki, 2005). More informed knowledge and understanding of genetics aids in the discovery of better pharmacological or pharmaceutical products. Genetic Engineering can increase the life span of the human population. Scientists argue that by use of genetic

modification, the average range of human life span could be increased to anywhere from 100 and 150 years because the modifications can lead to a deceleration in aging process (Bledrzycki, 2005).

One major setback of using HGE, is that the after-effects or consequences are not yet known. Scientists in the effort to cure one disease can inadvertently facilitate another disease to flourish (Haga & Willard, 2006). Genetic Engineering has borderline issues on many moral practices, particularly involving religion, which questions whether human beings have the right to manipulate the laws or course of nature. If all the defective genes are altered with better functional genes, genetic diversity will fade away due to the fact that all humans will have the same genome or traits (Annas et al., 2002). As a result, the human population may be susceptible to unknown forms of diseases or even viruses, and this may lead to the extinction of the human population on earth (Simmons, 2008).

Legal Issues in Genetic Engineering

The laws regulating and governing human genetic engineering differ from one country to another. In 2013, the United States debated whether they should ban prenatal engineering. The Australian government prohibits germline therapy through the “Prohibition of Human Cloning Act” (Rosario, Knooppers, & Nguyen, 2006). Countries that have developed laws prohibiting human gene engineering include Canada, Germany, and the United States. Countries like France, China, and Japan have set up guidelines that monitor gene therapy in clinical trials. The rest of the world has no laws for or against gene therapy. For example, in India, the Indian Council of Medical Research (ICMR) considers gene therapy a matter of ethical considerations, as it involves humans as ‘subjects’ in the research process. ICMR also supports gene therapy as it believes that it will alleviate the human suffering (Rosario et al., 2006).

The human genome project is a scientific project that was funded by the United States government. The project lasted thirteen years. During the project, several legal issues were raised concerning human genetics. In criminal law, lawyers argued that genetic engineering causes antisocial conduct and disorders which affects society at large. Lawyers also stated that the “Free will” of the participants was violated, since most of the participants were either tricked or coerced into the project (Rosario et al., 2006).

Lawyers pointed out the issue of privacy and confidentiality, which is a basic right for patients, based on the Hippocratic Oath. In cases of genetic characteristics disorder, the question as to whether the patient is treated individually or as the entire family emerges as they all suffer from the same condition of genetic characteristics. Another issue is whether the family is allowed access to the data about the patient’s genes since the family shares genetic features with the patient, which is relevant to the whole family (Bledrzycki, 2005)

Another legal issue concerning human genetic engineering is intellectual property rights. Will the law permit patentability of the human genome for use in therapeutics? Lawyers argued that the human genome is a common heritage of all humanity, and it is possessed by human species as a whole. Others argued that it is possessed by God and not corporate organizations involved in scientific research (Haga & Willard, 2006).

The issue of human rights is also considered. Human genetic engineering provides an avenue to reconcile the human genome with development of genetic technology. This infringes on human dignity and human rights (Annas et al., 2002). The UNESCO declaration, in article 6, states that, “No one shall be subjected to discrimination based on genetic characteristics that is intended to infringe or has the effect of infringing human rights, fundamental freedoms and human dignity”. Since HGE involves altering of a person’s genes, a legal issue arises when

parents manipulate a child's genes without the child's consent. This is a violation of the rights and dignity of the unborn child. Scientists discovered that genes that trigger genetic diseases constitute a great part of the inherited causes of human suffering (Haga & Willard, 2006).

Human genetic allows identification of people who carry such genes. This knowledge would lead to abortions, and allow future elimination of people who are carriers of heritable diseases. The lawyers question if this is a desirable step. The process of medical elimination has no set boundaries. Elimination of people living with the genetic conditions is a form of discrimination and disrespect to life as there is no lesser life than the other (Haga & Willard, 2006).

There has been a public policy debate over the years over the use of Genetic Engineering. The debate has been steered by the spiritual leaders, who question the use of genetic engineering in cloning. Genetic cloning is used as a new form of procreation, which differs with the biblical knowledge of how procreation should take place. The clergy consider cloning as a deviation from the spiritual laws, hence the opposition. No human should alter the process of procreation (Anna et al., 2002).

The technology of genetic engineering is expensive. Therefore, only the privileged members of the society will have the ability to afford it and have 'designer babies', who possess greater physical attractiveness and intelligence (Haga & Willard, 2006). In the end, this will lead to new forms of inequality and discrimination due to the creation of aristocracy. It could also lead to the emergence of marginalized individuals who will be unable to have a family, insurance, job, or healthcare. Insurance companies might use genetic information of these individuals for risk assessment process which may cause declining of their application for insurance as they are associated with increased health risks. The available genetic information could also be used by employers in screening out workers with specific undesired genes

(Bledrzycki, 2005). Bioethicists have also called for a ban on some of the species altering technologies recommended and enforced by any international tribunal. This is because of the concern that such genetic engineering could be used to make a slave race (Bledrzycki, 2005).

Cloning is mainly applied in reproductive failure or in couples that are both sterile or couples where both partners are carriers of an autosomal recessive genetic disorder. Cloning is used to provide a genetically linked offspring to the couple. Scientists argue that the right to clone children who are genetically related should only be denied if there is great harm (Haga & Willard, 2006). There has equally been a debate on the differing child parentage in genetic engineering. Some people believe that the father and the mother who contributed most of the child's genome should be the true parents of the child, while others believe that the donor should also have a part to play in the child's life. This leads to emergence of the legal question on who is to get the full custody of the child (Bledrzycki, 2005).

Another legal issue arising from Genetic Engineering is whether there are adequate resources for the genetic technologies. Some people believe that there are more important areas of medical practice that need to be invested in, rather than genetic modification. There are people who argue that the alternative options of having children, for example, adoption and egg donation, are more rational and cheap compared to gene cloning. The funds used for HGE can be better put to use in other medical issues (Haga & Willard, 2006).

Another legal question that arises concerning human genetic engineering is whether the law should intervene in cases where human genome is altered. There is rising concern about what Genetic modification will do to society. Some think that there will be an overdependence on genetic engineering, which may allow more dangerous biological technologies to be legalized in the future (Haga & Willard, 2006).

References

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Overall Impression

You know, I haven't noticed anything too horrible about this paper. Unlike all the crap I have to read through every day, this one is relatively well-written, with attention to grammar and punctuation. The author needs to be more attentive to avoid ridiculous mistakes such as "genetic genes" (page two of this paper). Also, sometimes the author didn't seem to bother too much with trying to convey their thoughts to the audience: "The clergy consider cloning as a deviation from the spiritual laws, hence the opposition." Looks more like a quick memo recorded during a boring lecture, rather than a thoroughly written paper. And the essay is full of such small shortcomings: an incomplete sentence here, a run-on sentence there, a small grammatical mistake here, awkward syntax there, and so on. That's not good.