

Genetic biotechnology

Technology



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Genetic Biotechnology

Genetic biotechnology is also known as gene technology, gene engineering, or genetic modification. It is form of biotechnology which involves the deliberate altering of the genetic material of living things so as to enhance or remove a particular trait of the parent organism. Biotechnology has a range of areas that are perceived controversial by certain groups of people while supported by others. These include gene therapy, cloning, prenatal selection, genetic tests, eugenics, and transgenics (Borem).

Genetic biotechnology involves cloning, which is production of one or more genetically identical individual plants or animals to the original organism (either in part or whole). It is potential of producing clone human beings that raised opposition to cloning because it brings into perspective the question of ethics in biotechnology.

The different takes on the whole issue of genetic biotechnology has been motivated by the background and moral or religious beliefs. This is because different communities, ethnic groups, and cultures have varied ethical issues. In addition, the adoption of scientific discoveries varies from communities and groups across the world because of different technological advances. As such there has being divided opinions on the whole issue from scientists, the clergy, potential parents, patients as well as politicians. For instance, President Bush expressed his opposition to the aspect of human cloning by terming it as “...allowing cloning would be taking a significant step toward society in which human beings are grown for spare body parts and children are engineered to custom specifications. This is unacceptable. ”

Countries all over the world are today faced with personal choices regarding the use of biotechnology with debates being on regulatory policies of the technology and choices (Becker).

The birth of Louis Brown in 1978 in England as the first vitro fertilized baby caused internal outrage. This was because her conceiving was done in a laboratory after her mother's egg was fertilized on a labdish by semen obtained a man. This is considered as the start of the genetic revolution that apparently has produced approximately a million such babies all over the world since then.

Therapeutic Cloning

This is also called Somatic cell nuclear transfer (SCNT) or Research cloning. It is a branch of regenerative medicine that specializes in the manufacture of human tissues as well as organ materials. It combines the principles of cellular biology, engineering and material manufacturing methods. It often targets to harvest stem cells that can be used to study human development and treatment of diseases.

There are two common types of cloning: Adult DNA cloning and Therapeutic cloning.

a) Adult DNA Cloning

This is also known as nuclear replacement. It entails the removing of the DNA from an embryo and then replacing it with the DNA gotten from a cell removed another individual. Thereafter the embryo is implanted in a

woman's womb and then let to develop into a new human. The DNA of the new human is often identical to that of the original individual.

b) Therapeutic cloning

Therapeutic cloning involves the removal of the DNA from a woman's ovum and adult cell. The DNA from the adult cell is then fused with the ovum, which is then given a mild electrical shock aimed at stimulating growth into a pre-embryo. Thereafter, the stem cells are harvested from the pre-embryo and can be used to grow almost any of the varied human cell types. The major cells that are composed using the harvested stem cells include those that make up kidneys and livers. Finally these organs can be implanted into patients that require them.

Proponents of therapeutic cloning have put forward of supportive arguments. In general, therapeutic cloning is regarded as the ultimate ways of wiping disease from human inheritance, bringing to existence a better human being who is almost immortal. Therapeutic cloning has been hailed for its capability to shape the collective humanity's genetic inheritance by the selection of embryos that to develop through pre-implantation genetic diagnosis.

Furthermore, it is also advocated for because of it avails human embryos upon which significant medical experiments can be carried out on. Thus it is believed that replacement organs would be available on demand unlike situations where patients have to wait for donations from other healthy individuals. Some patients die waiting or for lack of matching organs from donors.

Similarly, the creation of a brand new organ that has custom-grown eliminates the issue of a patient having to do with an old replacement organ which may have reduced functionality. However, the greatest advantage of the process that has been identified is the fact that both the organ and patient have identical DNA which then eliminates the danger of the implanted organ being rejected by the body of the recipient. Development of fetal organs and tissue is also said to provide a chance to eliminate such notorious conditions as diabetes, paralysis, heart disease, and Parkinson's disease.

In line with ethical issues associated with the therapeutic cloning, much opposition has been mounted against the process. Religious critics have termed therapeutic cloning as one going against or taking over the sole prerogative of creation of humans and animals. They contend the process brings about both human physiological or psychological problems besides the associated ethical issues. This is because the process is perceived to be targeted at producing a whole new species of human beings that are entirely perfect, devoid of diseases, deformities and custom-made with desired abilities. Besides being ungodly, therapeutic cloning is also opposed in the religious circles because it is aimed at economic gains without regard to human ethics. It is argued that life is a gift from God and deserves to be highly nurtured and cherished and not to be turned into a product that can be manipulated for profit.

Genetic biotechnology is not rejected in totality, however. It is suggested that there should be upholding of bioethics in the processes, including therapeutic cloning. As such formulation regulations have been strongly

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campaigns for. Three main principles have been proposed regarding biotechnology: Embryos should only be used if the aim of the research cannot be obtained through alternative means The embryos used in research or experimentation should not have reached gestation i. e. prior to 14 to 18 days of development, That those who use them must avoid owning them as their personal property, and Their ultimate destruction is accompanied by sense of sorrow or loss.

The debate on bioethics is bound to continue going into the future.