GROUP 21 ETHICS WEEK ASSIGNMENT

Do you think that there are features that are essential or common to emerging biotechnologies?

It is essential that biotechnology gives benefit to the population and is superior to current technologies available, either by being more cost or time effective or improving the health of the population.

Some examples of biotechnologies that have been beneficial to the health of the population include stem cell research and Preimplantation Genetic Diagnosis (PGD). Stem cell research has the potential to directly help sufferers of lymphoma and cystic fibrosis. PGD allows us to select against medical conditions which could severely reduce quality of life. This not only prevents suffering in the potential child and their family but also decreases the defective allele's frequency in the population.

GM crops are also indirectly beneficial to populations as they can be fortified with vitamins. GM crops further benefit populations by giving the possibility of increased shelf life of products and they can improve farmers' livelihoods. For example, in third world countries crops can be designed to withstand harsh weather conditions and pests so ensuring adequate food supplies and wealth during drought and flood. GM crops have the potential to be cost effective by reducing crop loss.

The Polymerase Chain Reaction (PCR) is used to increase the speed at which you can replicate a sample of DNA, making it time effective. This technology is vital in many fields including genetic testing and forensic science. PCR is also sensitive to very small pieces of DNA which is useful on crime scenes with limited evidence. It is an improvement on past methods which are less reliable than PCR.

A common theme in emerging biotechnologies is that they are initially not suitable to be used on a large scale. The main reasons for this are a lack of available funding or resources. Cancer medication, when it is first used, is expensive and has to be rationed by NHS trusts so therefore is not available to the whole population. Biofuels are a relatively new technology but it would be impractical to use them on a global scale until the production process is made more efficient due to lack of space to grow the crops. Although initially developing biotechnology is expensive, it tends to result in a long term benefit. The initial investment that is necessary may be a deterrent for companies with potential for a new technology even though it may have a health or social benefit.

Biotechnologies have some common features. Often they involve going into unknown territory in the hope of gaining insight and solving problems. They usually integrate knowledge from many disciplines. Emerging biotechnologies are often controversial because fear of exploring the unknown. The full consequences of using emerging biotechnologies, such as harmful effects on the population, are often unpredictable. This is because their effect can only be measured and observed once they have been implemented and monitored over a long period of time. One tragic example of this is when the drug Thalidomide was first brought out causing many pregnant women to give birth to children with limb deformities. Knowledge about biotechnologies is always evolving as we learn more about

the long term effects that they can have. GM crops may have a harmful effect on the environment if cross contamination of genes were to happen across species.

Another feature of biotechnologies is that when they are first brought out, they challenge ideologies and traditions of the population. Treatments such as IVF and PGD can be seen as unnatural and "playing God" and for these reasons biotechnologies often face strong opposition from states or religions. There is a fear that groups or individuals may use this technology for ulterior motives such as Eugenics, whereby they would attempt to create a superior or master race. It may also lead to the production of "Designer Babies" where parents can select favourable characteristics for their offspring.

In conclusion, all new technologies are intended to benefit mankind although they will face opposition and hindrance in their development. The benefits that biotechnology can offer us are numerous, including improvement to health and enabling cost and time effective solutions to problems. However, they challenge current traditions and may be used for unethical purposes.

What currently emerging biotechnologies do you consider have the most important implications ethically, socially and legally?

Emerging biotechnologies raise some important ethical, social and legal implications. This essay will aim to highlight these implications in the context of In-Vitro Fertilisation and cloning.

Ethical implications of therapeutic cloning are largely derived from whether an embryo is considered as 'living', as during the process embryos are discarded. Some people feel this is the same as murder, whereas others feel that an embryo is simply a collection of cells. The difference in views is due to where people define the beginning of life, i.e is a collection of cells defined as a living person, or is it when the embryo is completely developed. To add to this, another issue is that there are alternative sources of stem cells other than those derived from embryos that can be used in therapeutic treatment, for example, from the bone marrow and umbilical cord. However, stem cells derived from an embryo are the most versatile meaning there are wider medical advantages.

Social implications are centred around the ability to cure diseases by replacing damaged tissues. Some people, such as the Catholic Church, believe the end of an action can never justify its means. For example, in the context of cloning, the destruction of embryos for a potential medical benefit does not make it morally correct. Despite this, many scientists would argue that the benefits of using cloning for future medical treatments majorly outweighs the implication of the destruction of embryos

On the other hand, there is a concern that this will eventually progress into reproductive cloning which is not currently legal. The legal implications of therapeutic cloning, limit where in the world it can take place. This is due to opposition from pro-life groups preventing legalization in certain countries.

In Vitro Fertilisation (IVF) was a major breakthrough in the treatment of Infertility. Ethical implications of IVF include who should have access to treatment on the NHS. For instance at what age should women be denied treatment and should IVF be available to same sex female couples? Some people feel that above a certain age, becoming pregnant is unnatural. A similar view may be held for same sex couples. Others feel that this is irrelevant as long as the child has a stable environment to grow up into, and no matter what the circumstances are it is always better to exist than not exist at all.

Social implications concern the progression of IVF to 'designer babies' creating a superior race where certain physical attributes are selected. This would have consequences where the disabled population

would be classed as lower status citizens. To add to this, there is a worry that in places like India and China, where having a boy is more favourable, couples would take advantage of choosing the sex of the child. IVF does however allow infertile women the opportunity to conceive a child and therefore be able to experience parenthood. On the other hand, can conceiving a child be classed as a Human Right? If so, this would have implications on how far the NHS would fund the treatment.

Currently, IVF is subject to regulation by the Human Fertilisation and Embryology Act which poses some important legal implications. For instance, there is a ban currently for selecting the sex of the offspring and requires that clinics take into account the child's welfare.
To conclude, the ethical, social, and legal implications of cloning and IVF are very complex with everyone having different views on the situations. Thus it is difficult to reach a final judgement.