

This response was submitted to the consultation held by the Nuffield Council on Bioethics on Emerging biotechnologies between April 2011 and June 2011. The views expressed are solely those of the respondent(s) and not those of the Council.

## **GROUP 11 5 YEAR COURSE**

### **What ethical principles should be taken into account when considering emerging biotechnologies? Are any of these specific to emerging biotechnologies? Which are the most important?**

When any new biotechnologies are being released, or developed, there are a variety of ethical issues that can be raised and should be acknowledged. These can differ greatly and it can be argued that all are equally important; however we must have ways of arriving at a conclusion. This essay will aim to establish the ethical issues surrounding biotechnologies and what principles should be taken into consideration during their development and use.

Ethical issues are subject to individual beliefs and are often influenced by a person's cultural background. This means members of the population often prioritise issues differently and therefore a common stance cannot be taken or assumed- decisions are taken in accordance with the law.

The Oxford Dictionary defines ethics as "*moral principles that govern a person's behaviour or the conducting of an activity*". In the case of new biotechnologies, these may prevent some members of society from agreeing with the methods of developing technologies, or even from agreeing to the method of administration and use.

One area of concern is the potential danger to the environment from the development of biotechnology, both in respect to the sourcing of its materials and the impact of its use. Some groups are concerned that big organisations will be so profit driven that they neglect to consider their ethical obligations to prevent extensive environmental damage. A current example is the development of genetically modified crops that are pesticide resistant. These plants have genes that result in the pesticide having no effect on them meaning the farmer can spray vast quantities indiscriminately. These chemicals not only kill the pest, but could potentially leak into the soil and the water system affecting many other organisms. This could have devastating consequences on the entire ecosystem. Is it wrong to cause the extinction of a species to allow gain for the human race? Who is to blame should the damage to the ecosystem result in detrimental effects?

A further issue appears to be the worrying lack of knowledge we have regarding the possible side effects of GM crops and gene modification. The reasoning follows if we do not understand the full implications are we able to make a balanced and rational decision regarding the matter? However at which point is there sufficient evidence to act? We have no idea how these biotechnologies will affect the human body in the long-term, so is it ethical to provide food we are not sure is safe? Or is it even more unethical to deny food to a population that has a shortage?

Similarly, it is thought by some, that these profit driven companies are unlikely to invest in variants of their products, thereby reducing genetic diversity and restricting that species' gene pool. If all these plants are identical then if a certain pathogen were to emerge, all crop of that species could be wiped out completely. Could we agree to this biotechnology knowing this could be an outcome? How else could we finance the research to prevent this?

The above raises a question that can be applied to any sort of new technology - who is financing the research? What are their motives? It would be unethical for a company not to investigate where funds were being obtained and the reasons for those donations, but would the researchers risk possibly losing the donation? This is an important issue regarding biotechnology because of the ramifications of possible misuse of the research. Stem cell research, for example, is a controversial area because it could be used in eugenics but it also has the potential to vastly improve medical care.

In many populations, there is not only a difference in wealth and resources but also a drastic difference in cultural and religious beliefs. This diversity is widely celebrated however it does raise important ethical questions and differing opinions. IVF (in-vitro fertilisation) is one biotechnology that has been scrutinised particularly in regard to this. It is deemed by some to be "playing with life", something that should only be left to the powers of God. However is it ethically sound to subject all to one group's beliefs? Furthermore, multiple oocytes can be fertilised and these may be destroyed afterwards. This would be classed as murder by some, depending on where their definition of life begins. For others, who are unable to conceive, they believe they should be allowed to have a child if the technology exists. The child would likely be cared for and, if we utilise other technologies in all other aspects of our lives, why not with conception?

Another significant ethical issue which arises from biotechnology is in relation to the testing and trials involved in improving and perfecting the product. It is therefore important to ensure that a company does not take advantage of a particular socio-economic or ethnic group. The product should also only be tested on the groups of people likely to benefit from the product after its development and only when fully informed consent has been obtained. During development many companies test products on animals; this can sometimes mean animals suffer as a result of adverse side-effects from the trials. Many animal rights activists feel that this is cruel and immoral.

A variety of ethical principles have been presented in this essay some with both positive and negative connotations. These have been reinforced by illustrating how they are applicable to certain biotechnologies such as gene modification and stem cells. However which principles are most important can only be determined for one individual, because independent thoughts and beliefs are the basis for interpretation of what is ethical. It is unlikely that a total agreement will ever be made on an issue; nevertheless it is only through debate and exploration of others beliefs that this may be attained.

### **What role should public opinion play in the development of policy around emerging biotechnologies?**

With the emergence of new biotechnologies, the public often feel they should have greater involvement in governmental decisions regulating this industry. Modern society currently has shifting opinions, with many people becoming more accepting of new technologies as they become more integrated into society. However there are still large groups of people who are strongly opposed to these technologies due to moral, ethical or religious reasons.

It is important to consider the public's opinion as ultimately they will be using the service. When a new technology is introduced the public are subject to it even if they do not directly access it and may be affected by it. Also, if there is strong opposition from the public towards the technology there may be no market for it. Advisory bodies and the government should take this into account when reaching decisions regarding policies.

The public's opinion will always influence governmental decisions as any policies passed will need to cast the current government in a favourable light. Pressure groups organise campaigns to express public opinion and these can have a large impact on policy making, especially when backed by a significant proportion of the population. Considering the influence which pressure groups already have on policy making, this begs the question as to why the public cannot play a larger part.

Involving the public seems ethically correct; however this may be difficult logistically. The public may be disinterested or not well informed. General public opinion can also be greatly influenced by the media. This could be detrimental to emerging biotechnologies as most reports of biotechnology are very sensationalist. This can be illustrated by the controversy surrounding the MMR vaccine, when the findings of an unsubstantiated study were widely reported to the public. If public opinion had been taken into account when developing policy about this, a lifesaving vaccine that was later proved to be harmless could have been removed from circulation.

The public's lack of knowledge could also be a problem if they were involved in policy decision. Sources of information used by the public vary widely and can be unreliable. Understanding of biotechnology can be partially determined by the level of education a person has. Biotechnology is a relatively new development and so there may be an inherent fear of it due to lack of familiarity. For example, there is a general perception that genetically modified foods have the potential to be harmful as they are 'unnatural'. Many people are strongly opposed to these foods although the basis for this is unconfirmed by scientific evidence. This echoes a common reluctance to accept new biotechnologies.

It can be difficult to take everyone's opinion into account as there are many conflicting views. These may be due to religious, cultural or social beliefs. There will always be extremes of opinion within society, which cannot be accommodated within government policy.

Ultimately, after considering the above arguments, we believe that public opinion should be taken into account throughout the policy making procedure. Ethically the public should have a right to be able to influence the government's decisions about emerging biotechnologies as they could be affected by them. However, there should be a limit to the extent of this influence as they are not necessarily fully informed about the new technology.