

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.

- 1 How would you define an 'emerging technology' and an 'emerging biotechnology'? How have these terms been used by others?
- 2 Do you think that there are there features that are essential or common to emerging biotechnologies? (If so, please indicate what you think these are.)
- 3 What currently emerging biotechnologies do you consider have the most important implications ethically, socially and legally?

My response :

1. Whilst I would generally agree with the definition of Emerging Technology (ET) and its differentiation from Emerging Biotechnology (EBT) as mentioned in Pg 4 of the consultation paper (CP), in the absence of something better, it may be too simplistic a distinction as lines get increasingly blurred given some 'new biological insights' that have emerged in recent years.
However, I would think in addition to "with a biological basis or use", one should also consider including 'biological impact' when defining EBTs. The myriad types of EBT that impact on the environment in which biological lifeforms. e.g. microbes that clean up oil spills, bio-remediation, devices/techs thought to be separate from biology in the past but which we now know to be able to influence biological systems in a significant way i.e. prolonged use of mobile phones and cancer risk, etc.
2. Some features are common, some are unique. It depends on which EBT /system one refers to. The science usually moves ahead of the policy framework, legislation and public understanding.
3. From my experience as a educator, geneticist, mother, nature lover, domestic manager, traveller, urban dweller, patient, etc. I would think that the EBTs that may have most important implications ethically, socially and legally are those that impact on the way we perceive ourselves as a distinct species from yet synergistic with other biological life-forms, as drivers of progress / betterment, health & wellbeing, human evolution / reproductive fitness, and spirituality.

- 4 Are there examples where social, cultural and geographical factors have influenced the development of emerging biotechnologies (either in the past or currently)?
- 5 Are there examples where social, cultural and geographical factors have influenced public acceptance or rejection of emerging biotechnologies?
- 6 Are there examples where internationalisation or globalisation of research, markets and regulation have influenced the development of emerging biotechnologies?
- 7 How have political traditions (such as liberal democracy) and political conditions (e.g. war) influenced the emergence of biotechnologies?

My response :

4. There are numerous examples where EBT have been influenced by these 3 factors. E.g. GMO created to withstand high salinity, droughts, pests (geography, socio-economics),
5. Yes, for example :
People in countries that are blessed with high biodiversity and ecosystems may view some EBTs as detrimental to the 'natural order of things'. The GMOs story is well known.
People with strong religious beliefs may to reject EBT therapies derived from sources they may consider 'unclean/forbidden' i.e. xenotransplants, reproductive & therapeutic cloning, certain vaccines, etc. Also there is the cost factor and affordability
6. Yes. e.g. Clinical trials, agricultural produce/ products, pharmaceuticals, etc.
7. Yes, both have influenced the emergence of BTs

- 8 Are there ethical or policy issues that are common to most or many emerging biotechnologies? Are there ethical or policy issues that are specific to emerging biotechnologies? Which of these, if any, are the most important?
- 9 Do you think that some social and ethical themes are commonly overlooked in discussions about emerging biotechnologies? If so, what are they?
- 10 What evidence is there that ethical, social and policy issues have affected decisions in (i) setting research priorities, (ii) setting priorities for technological development, and (iii) deploying emerging biotechnologies, in either the public or private sector?

My response :

8. The world is indeed 'flatter' than it used to be given progress in transportation, IT, logistics, etc. Humanity is more connected and perhaps better informed about world events. People are more empowered to make choices.

Ethics is neither static nor predictive. As new knowledge emerges and as more challenges arise, new ethical issues will have to be considered and policy decisions taken.

We will constantly as we go along have to ask of ourselves and of society, "What would be the right thing to do"? I think it would be extremely difficult, if not impossible to 'pre-empt' the next ethical question to ponder or the 'most important' issues.

9. Yes.
I have often felt that discussions about EBT in developing countries, such as Malaysia and elsewhere, usually involve technical experts, govt agencies, politicians, industrial players and funding organizations. They rarely include sociologists, ethicists, relevant NGOs, representatives of civil society, who may be able to provide additional social and ethical insight.

10. I have not researched this area.

Ethics

- 11 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?
- 12 Who should bear responsibility for decision making at each stage of the development of an emerging biotechnology? Is there a clear chain of accountability if a risk of adverse effects is realised?

My response :

11. I refer to the mid-level principles and advocate that all of them be taken into account when EBT decisions are to be made.

a) **Autonomy** with Responsibility & Accountability to Society (Communitarianism)

b) **Beneficence** : esp. benefits sharing amongst all stakeholders, significantly reducing/eliminating exploitation and **Non- maleficence**

c) **Justice**

12. This is a joint responsibility amongst all parties concerned in the various stages of development both locally and internationally. Responsibilities for decision making depends on which country you are in, which industry it is, and whether or not provisions have been put in place to safeguard the interest of providers/developers/users of EBTs.

Given that there are differences in various countries, industries, internationally binding agreements/ policies and governance mechanisms, clear chains of accountability may not be in place, when adverse effects occur.

There is much in the literature and several bioethics organization websites about heinous practices of dumping of sub-standard drugs, banned 'therapeutics', radioactive and chemical wastes, dirty polluting industries, etc into developing countries,

I think it is the responsibility and business of good government in any country to have an EBT policy framework and governance mechanisms in place that is in line with developmental and nation building aspirations. It is also the responsibility of any company, industry, organization,

developer, relevant party to ensure they meet local and international GLP, GCP, and other relevant regulations.

Public engagement

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

16 What public engagement activities are, or are not, particularly valuable with respect to emerging biotechnologies? How should we evaluate public engagement activities?

15. EBT policies & decisions taken should reflect elements of public engagement / consultation.

16. A well planned and coordinated public broadcast via suitable media, by the relevant ministries, authorities, industries, etc, on a particular EBT issue inviting public feedback/opinion is valuable. Professional bodies where relevant, also need to get involved, i.e. the institute of engineers, IT professional, medical councils, etc.

The approach used by the Nuffield Council and similar consultative councils/committees may have been effective.

17 Is there something unique about emerging biotechnologies, relative to other complex areas of government policy making, that requires special kinds of public engagement outside the normal democratic channels?

My gut feeling is that where specialized knowledge is concerned and large gaps in understanding exist, where a significant amount of a national budget is involved, where urgent decisions are required, etc., normal democratic channels may not suffice. Special kinds of public engagement may be necessary.

