

Emerging biotechnologies

Joint reply by HEAL/CELS

HEAL UoS (Health, Ethics And Law, University of Southampton) is an interdisciplinary network of academics and clinicians interested in exploring the nature of law, its processes of production and impact on society through examining specific examples in Health Care Law and Ethics.

CELS (Clinical Ethics and Law at Southampton) is a multi-disciplinary group within the Faculty of Medicine at Southampton. The membership of the group includes clinicians, social scientists, academic lawyers and philosophers. The aim of the group is to harness the diverse activity involving ethics and law that already takes place within the Faculty of Medicine and create a group where mutual interests support and interaction will promote both research and research-led teaching in the field.

This is not a formal response from the University as an institution, but rather reflects the views of members of the networks - although as one might expect, not everyone is of the same view.

Questions

1 How would you define an ‘emerging technology’ and an ‘emerging biotechnology’? How have these terms been used by others?

We agree with definition of ‘emerging technology’ used in the consultation (Harper, 2010). However, the definition of *biotechnology* as “a technology with a biological basis or use” raised some concerns, not least that the use of such an expansive definition – one that potentially includes *any* (emerging) technology with a biological use – may be too broad. While the expansion of the term might have some benefits, i.e. the consultation can consider bio-defence as an emerging biotechnology, it simultaneously runs the risk of being too broad and therefore meaningless. By way of example, a microscope is a technology which can have a biological use, but is unlikely to be categorised as a ‘biotechnology’ within the traditional meaning of this term.

We concur with the view on page 4 that technologies are also techniques. However, we would caution against taking a linear, deterministic view of technology development (i.e. the push or pull view of technology development). For example, care should be taken when simplifying the case study of the ‘Qwerty’ keyboard as an example of ‘lock in’ (as highlighted in Liebowitz, 1995); and research within the Science and Technology Studies field illustrates how technology development relies on a complex set of forces rather than a linear pathway or pathways. As a result we agree with Ursula Franklin’s view that “technology involves organization, procedures, symbols, new words, equations, and, most of all, a mindset” Franklin (2009 p.12).

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.)

It is difficult to posit – in the abstract - ‘essential’ or ‘common’ features across such a broad category; although as the consultation paper notes on page 5, one factor that is often present is the ability to ‘generate controversy’, howsoever caused or defined, irrespective of the real, hypothetical or imagined risks. Further research would be beneficial, especially comparative research, examining the contexts in which emerging biotechnologies are developing and the legal, policy and social responses to them.

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

A number of recent and current emerging biotechnologies are in fields that are highly regulated in the UK, e.g. assisted conception. Therefore, whilst some such developments might have particularly salient ethical, social and legal considerations, there are clear frameworks in place to address emerging issues and developments (and though some might query those frameworks, we do not seek to do so here). Further, it might be argued, as mentioned in the consultation, that the impact of biotechnology upon human identity (i.e. hybrid embryos, xenotransplantation) raises questions about what it means to be human. However, similar challenges are also posed by the growing knowledge of the “natural” world; for example, it is estimated that the “human” body is also comprised of 1000 - 2000 other species (Sears, 2005; Grice et al, 2009), therefore such questions are not the preserve of 'emerging' biotechnologies per se.

In light of these observations, a number of our network members considered that the most pressing ethical, social and legal implications, in terms of scale and quality/impact, are those raised by food and biofuel related biotechnologies on the world’s poorest nations and populations.

4 Are there examples where social, cultural and geographical factors have influenced the development of emerging biotechnologies (either in the past or currently)?

Yes, as noted in the consultation document, and there is a solid body of academic literature surrounding this issue; see for example the development of biotechnology and social and physical locations (Höyssä et al, 2004) and nanotechnology (Wiek et al, 2007).

5 Are there examples where social, cultural and geographical factors have influenced public acceptance or rejection of emerging biotechnologies?

Again, as noted in the consultation, this seems to be the case. However, the example of GM crops outlined in the consultation misses certain key points and particular nuances need to be carefully considered. For example, the supermarkets in the UK

were active players in the early PUS engagement, and traceability of food also became a marketing feature between the UK supermarkets (Nunn, 2000). The growth of the “organics” section in the supermarket was one unexpected result, in monetary terms, this was valued in the UK at £1.84 billion in 2009 (Business link, 2011). Further, in the early stages, the organisation Greenpeace supported certain GM technologies, whereas they had expressed specific concerns over the “terminator seeds” which prevented farmers from retaining seed for use the following year. Hence, it is important to consider these examples closely, and to avoid, for example, typifying genetically modified crops/food as a homogeneous category - indeed Quorn serves as an example where a biotechnological food item has been successfully introduced in the UK, yet was met with resistance in the USA.

6 Are there examples where internationalisation or globalisation of research, markets and regulation have influenced the development of emerging biotechnologies?

Yes, one such example is GM food, as noted in the consultation. There is also concern over the international market in reproductive biotechnologies, ie. surrogacy, import/export of gametes, and cross-border care (see for example “Global infertility and the globalization of new reproductive technologies: illustrations from Egypt” by Marcia C Inhorn (2003)). What is currently less clear is the extent and ways in which the internationalisation or globalisation of research, markets and regulation influences and impacts the *development* (rather than use) of emerging biotechnologies in this or indeed other fields.

7 How have political traditions (such as liberal democracy) and political conditions (e.g. war) influenced the emergence of biotechnologies?

These influences clearly depend on the specificities of the technologies/examples under consideration. Historical examples, such as the development of the contraceptive pill, abortion and IVF, highlight the importance of political contexts and wider influences. Whilst some examples that emerged under war-time political conditions are well known and documented accordingly (e.g. eugenics under Nazi ideology), others are perhaps less so; including the policy regarding forced sterilisation in Sweden, which began in 1936 and continued to 1976. This policy was shown to connect to the ideology of the welfare state – 90 percent of the 63000 people sterilized were women - and sterilization was linked to the social status and role of women (Runcis, 1988). Further research is required in order to examine whether neoliberalism and the internalisation of eugenic principles has the potential to result in the same population outcome as these government policies.

One current example cited during the discussion is the continued development of reproductive biotechnologies, e.g. under the “RAPID” programme, which is developing non-invasive pre-natal genetic testing, funded by the NIHR (www.rapid.nhs.uk).

A second example concerns biofuels and current and future political/war situations. Biofuels, promoted in the US context as having “the potential to reduce U.S.

dependence on foreign oil”, is a claim which has prompted an immense funding drive to support this emerging technology (<http://www.bio.org/ind/advbio/>).

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?

In our view these are highlighted in detail in the consultation document. As noted above, it is difficult in the abstract to distil a single principle or set of principles that are more important than others due to the nuances raised by specific technologies/scenarios.

9 Do you think that some social and ethical themes are commonly overlooked in discussions about emerging biotechnologies? If so, what are they?

No comment.

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?

No comment.

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?

See above, question 8.

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?

It is unclear what the purpose of the chain of accountability is here – accountability for decision-making or for liabilities in law for adverse outcomes? If it is the latter, modern technologies often involve a number of companies which undertake specific steps in research, development, production and marketing, coupled with limited legal responsibility. When GM crops have been illegally released, the legal response has been limited, as highlighted by Jennifer Clapp (2008):

“While Corporate Social Responsibility and the Global Compact encourage internalization of environmental costs and application of the precautionary principle amongst firms, in the case of illegal GMO releases these measures have proven extremely weak. In the case of illegal GMO releases, external, state-based regulation which places liability squarely on firms is likely to be much more successful as a means to prevent future occurrences of this problem.”

13 What roles have ‘risk’ and ‘precaution’ played in policy decisions concerning emerging biotechnologies?

No comment

14 To what extent is it possible or desirable to regulate emerging biotechnologies via a single framework as opposed to individually or in small clusters?

We consider that it would be impossible to regulate biotechnology (defined by the consultation as a technology that has a biological basis or use) using a single framework.

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

There are significant difficulties in determining the role of public opinion (and indeed perhaps even the purpose of public consultation) in the development of policy in contested areas, evidenced not least by the selective use of some respondents' views and subjugation of others in deliberations on developments in assisted conception re the Draft Human Tissues and Embryos Bill, 2007-8. See further Jones, C 'Exploring the Route(s) from Consultation to Public Policy Making', in M.Freeman, (ed), Current Legal Issues: Law and Bioethics, OUP, 2008, 257-285. How, and in what ways, if at all, is it possible to take into account the views of members of the public who oppose emerging biotechnologies? Is it legitimate to simply ignore their views in toto? Or are there ways in which their opinions might be more usefully engaged with?

See also response to question 16.

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

The consultation seemed to indicate that public engagement is aimed at fostering understanding, trust and acceptance. However, the “GM Nation” in 2002 is an example of a failed public engagement exercise (see for example Rowe et al, 2005). It is clear that if policy makers do seek to engage with the public then they must do so in a meaningful way, without presupposing the outcome.

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?

This question assumes that public engagement occurs within “normal democratic channels” for other complex areas of government policy making. However, we do not believe that emerging *biotechnologies* require special kinds of public engagement, but rather that *all* emerging technologies and complex areas of policy require such activities.

References

- Business link (2011) "Converting to organic farming, Key features of the organic market" Available on-line <http://www.businesslink.gov.uk/bdotg/action/detail?itemId=1082248283&type=RESOURCES> Accessed 12/06/2011
- Clapp J (2008) Illegal GMO releases and corporate responsibility: Questioning the effectiveness of voluntary measures. *Ecological Economics*, 66(2-3), 348-358
- Franklin U (1990) "The Real World of Technology" CBC Massey Lectures Series. Toronto: CBC Enterprises
- Grice EA, Kong HH, Conlan S. (2009). Topographical and Temporal Diversity of the Human Skin Microbiome, *Science*, 324, 1190-1192.
- Liebowitz SJ, Margolis SE (1995) "Path dependence, lock-in, and history" *JLEO* 11 (1): 205-226
- Hoyssa M, Bruun H, Hukkinen J. (2004) The co-evolution of social and physical infrastructure for biotechnology innovation in Turku, Finland. *Research Policy* (33), 5, 769-785
- Inhorn MC (2003) Global infertility and the globalization of new reproductive technologies: illustrations from Egypt. *Social Science & Medicine* 56(9), 1837-1851
- Nunn, J. (2000) What lies behind the GM label on UK foods. *AgBioForum* 3(4), 250-254. Available on the World Wide Web: <http://www.agbioforum.org>.
- Rowe G, Horlick-Jones T, Walls J., Pidgeon N., (2005) Difficulties in evaluating public engagement initiatives: reflections on an evaluation of the UK GM Nation? public debate about transgenic crops. *Public Understand. Sci.* 14,331–352
- Runcis M (1998) *Steriliseringar i folkhemmet. [Sterilization in the Swedish Welfare State]*. Stockholm: Ordfront. 1998
- Sears CL (2005). "A dynamic partnership: celebrating our gut flora". *Anaerobe* 5, 247-51.
- Wiek A, Zempa S, Siegrista M, Waltera AI (2007) Sustainable governance of emerging technologies—Critical constellations in the agent network of nanotechnology *Technology in Society* 29(4), 388-406