

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”?

I think the report does a good job of defining these terms. As it points out, emerging technologies are not merely new. In addition, they are likely to have significant and long-lasting social, political, and economic effects. However, isn't this true of any new technology? Consider, for example, the printing press, railroads, or computers, all of which can fairly be said to have revolutionized society. So that feature does not seem to be unique to the conglomerate of technologies lumped under “emerging technologies.”

Interestingly, the report includes preimplantation genetic diagnosis under emerging biotechnologies. In the book I co-edit (with Alex London and John Arras), *Ethical Issues in Modern Medicine*, 7th edition (McGraw-Hill, 2008), we do not put PGD under “Emerging Technologies.” This is mostly because the technology is well established. It is not “emerging” in the sense of being new. In addition, PGD is primarily used to prevent the birth of children with genetic or chromosomal diseases. For this reason, it seems more akin to prenatal testing than to, say, genetic intervention into the embryo for enhancement purposes. As noted in the report, this points to a feature of emerging technologies that gives people concern: namely, that they seem to challenge our conception of what it means to be human, and what our relationship to “the natural” or “the given” ought to be. Reproductive cloning, genetic manipulation of the embryo, and enhancement technologies all raise these deep questions.

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

Yes and no. As indicated in the report, what makes emerging biotechnologies particularly controversial is the sense some people have that they will have a deleterious effect on human nature or human society. (No doubt people said this about books, railroads, and computers too -- an important thing to keep in mind. Nevertheless, what concerns many people is that these technologies will not only change the world in which we live; they will irreversibly change us, and not in a good way.) So this concern about changing human nature in a bad way is a common theme to the discussion of emerging biotechnologies. On the other side, John Harris has argued in *Enhancing Evolution: The Ethical Case for Making Better People* (Princeton University Press, 2007) that these technologies could change human nature in a good way, in which case we should pursue them. What matters, in my view, is not the technology. All technologies have the power to change the world and to change our human nature. Literacy, as Allen Buchanan points out in “Enhancement and the Ethics of

Development” (*Kennedy Institute of Ethics Journal*, Vol. 18, no. 1, 2008, pp. 1-34), undoubtedly affected the development of the human brain and the history of our species. What matters is not how changes are effected but what those changes will be, and whether they will ultimately benefit or harm humanity.

While the effect on human nature and society is a common feature to emerging biotechnologies, it would be a mistake to assume that all of them raise the same ethical issues. Some of the technologies raise primarily health and safety issues. This is the case, in my view, for genetically modified foods. By contrast, genetic enhancement to improve performance in athletes raises both safety and other issues, such as the ideals of sport, as discussed by Thomas Murray, “Enhancement” in Bonnie Steinbock, *The Oxford Handbook of Bioethics* (Oxford University Press, 2007, pp. 491-515). Equally, when we talk about lengthening the human life span, the issues aren’t simply the economic ones of supporting more people, but also questions of the meaningfulness of indefinitely extending life. A number of philosophers have argued that it is our mortality that makes us human, and therefore death -- when not premature -- is a positive good.

Because emerging biotechnologies tend to raise deep philosophical issues, it is important for people in different disciplines to think about them. At the same time, I think it would be a mistake to assume that there will be a set of principles unique to emerging technologies (I suspect that the underlying principles for emerging technologies will be those that ought to be applied to any technologies, new or existing) or that the same issues arise in all of them.

3. What currently emerging biotechnologies do you consider to have the most important ethical implications? [I’ve modified the question to fit my own area of expertise.]

There are at least two ways in which emerging biotechnologies have important ethical implications: theoretical and practical. One very interesting theoretical issue concerns the attempt to understand the nature and significant of “the natural.” (This is the subject of a recently published book edited by Gregory Kaebnick, *The Appeal to Nature* (Georgetown University Press, 2011), in which I have a chapter called “Legitimate and Illegitimate Appeals to Nature: Lessons from John Stuart Mill.”) Too often, people attack a technology as “unnatural” without any reflection on what makes a technology unnatural (they’re all unnatural in one sense of the word) or why that should be considered a defect.

Another theoretical issue concerns responsibility for harmful or less desirable outcomes. In “Genetic Interventions and the Ethics of Enhancement of Human Beings” (*Oxford Handbook of Bioethics*, pp. 516-535), Julian Savulescu argues in favor of an obligation to enhance by suggesting that if it would be negligent of parents to provide their unusually bright child with a diet that would prevent him or her from becoming merely average, then it would be just as blameworthy for parents to fail to give their child of average intelligence a diet that would make him or her really smart. The former is viewed as harming, the latter as enhancing but,

Savulescu argues, there really is no moral difference in the two cases. This is contrary to most people's intuitions, but it is not easy to say what the moral difference is.

In addition to raising vexing philosophical questions, emerging technologies may have important ethical implications for social values and institutions. In *The Case Against Perfection: Ethics in the Age of Genetic Engineering* (Harvard University Press, 2007), Michael Sandel writes movingly (if not always persuasively) about the effect on parent-child relations, and the tendency to "hyper-parent," if parents are capable of determining (to some degree) in advance what sorts of traits their children will or will not have. Others have focused on the justice implications: will genetic enhancement exacerbate the trend toward social inequality? Will it make us less tolerant of the imperfect, the unenhanced? Here I think it is extremely important to remember that a technology is only as good or as bad as the uses to which it is put, and that is something for human beings to decide. We could make enhancement of intelligence (assuming this is possible -- something about which I have great doubts) available only to those able to afford it, thus exacerbating the gap between haves and have nots. But we could also use the technology to give a head start to children already disadvantaged. That is a matter of social decision -- something Allen Buchanan nicely emphasizes in his new book, *Beyond Humanity: The Ethics of Biomedical Enhancement* (Oxford University Press, 2011).

I suspect that the emerging technologies with the greatest promise are embryonic stem cell research and genomic medicine. Here in particular "bans or over-restrictive regulation can lead to the delay or loss of valuable benefits," and this too is an important ethical issue.

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?

As I've indicated above, concerns about emerging biotechnologies tend to focus on harmful effects on human nature and society. Such concerns go beyond ordinary health and safety issues. In my view, it is important to air these concerns, because they are deeply meaningful to many people. At the same time, I also think it is important for philosophers to make a number of points. First, the very notion of "a human nature" is problematic. There are many ways to be human, and we should not forget that humanity is as much a cultural concept as it is a biological one. Second, ideas of what it means to be human are continually evolving. Undoubtedly, the ability to travel great distances in very little time and to get news of faraway places almost instantly has greatly affected the kinds of beings we are. For this reason, we should be suspicious of claims that this or that technology should be rejected because it will change "who we are." Third, sometimes change is a good thing. There is no reason to think that human beings are perfect as we are. Technological developments to make us kinder, smarter, healthier, and so forth are in principle welcome assets. Fourth, a decision

to ban a technology is as much subject to ethical evaluation as a decision to allow or encourage it.

Rather than saying that there are ethical issues common to most emerging biotechnologies, I would say that there are common ethical objections to emerging biotechnologies. Some of these objections are obviously salient, such as concerns about health and safety, including the impact on the environment. Others, such as the “playing God” objection, are pretty useless, in my opinion. As the late Chief Rabbi of Great Britain, Immanuel Jakobovitz, put it in a talk at Leeds University, “All human interventions are ‘playing God’ in that they change the course of nature. That doesn’t make them good or bad.” The morally important sense of the “playing God” objection is that we fallible human beings should not assume that we have the wisdom to know what will be the long-term effects of many technologies. We should avoid hubris and accept our limits. However, that seems merely to bring us back to the health and safety concerns. Moreover, it doesn’t tell us anything about how to interpret the precautionary principle. This is another huge area of both theoretical and practical concern.

No, I do not think that there are any ethical or policy issues specific to emerging biotechnologies. Virtually all technologies have the power to have significant and long-term effects, good and bad, on humanity, though we may not know now what those long-term effects will be.

11. What ethical principles should be taken into account when considering emerging biotechnologies?

I favor in general a “tempered consequentialism,” which I think is also helpful when thinking specifically about emerging biotechnologies. What are the likely effects of adopting (sponsoring, allowing, promoting) the technology? What are the likely effects of restricting (banning, not funding, criminalizing) the technology? The effects to be considered include considerations of social justice and the traits (virtues/vices) likely to be encouraged or discouraged. This version of consequentialism is not a hard-core utilitarianism, and it is compatible with Kantian and Rawlsian considerations, as well as virtue ethics.

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?

As I’ve indicated above, I think it would be a mistake to assume that all emerging biotechnologies raise the same theoretical and practical issues. I would also beware of overly simplistic and ill-defined terms of opprobrium, such as “unnatural,” “commodification,” and “playing God.”

It is possible that there could be a single agency in the UK, analogous to the HFEA, which served as an umbrella for differing technologies, so long as this did not lead to the mistake identified above.

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

This is a great question. On the one hand, it is always a good idea to invite public discussion and comment before making important policy decisions. Such transparency is essential to democracy, and avoids public suspicion. On the other hand, the public often has ideas that are not backed up by the evidence, such as the view that autism is caused by vaccination, and can have really harmful effects. So I would say that policy must take into consideration public opinion, but in the last analysis, it must be determined by accurate scientific information and sound philosophical arguments. If these depart from public opinion, then the public needs to be educated, not pandered to.