

# Introduction: a guide for the reader

## What is the aim of this report, in a nutshell?

1. Biotechnologies of many forms present some of the most important sources of transformation and disruption in the world today. The potentialities, uncertainties and ambiguities are enormous, yet the form and directions taken by emerging biotechnologies are not a given, nor are the benefits self-evident. In practice, only a fraction of the technologies that are possible can actually ever be fully realised. As particular developments take place, others are foreclosed; the particular technologies that are prioritised in research and development depend not only on the general societal benefits but also on historical chance and momentum, and the deliberate or inadvertent effects of vested interests and power. Important ethical and political issues are therefore raised, presenting significant challenges for governance. This report will explore these issues and challenges, and make recommendations to guide improved practice in policy making, in research and regulation. The aim is to help maximise the socially beneficial and democratically accountable governance of emerging biotechnologies.

## What kind of report is it?

2. This report is not focused on a particular historical development (for example, the ability to synthesise DNA) or even a particular sector (such as medicine, agriculture or industry). Nor is it addressed to a single professional role (research, policy making, business, etc.). Instead it addresses the shaping and selection of emerging biotechnologies (and of technological responses to social challenges more generally) through the way in which decisions and conditions in these various contexts are related. Indeed, it is one of the insights of the report that the segregation of decision contexts and the order in which they are prioritised constitutes a source of potential failure to maximise social value through biotechnologies.
3. Our subject is therefore not emerging biotechnologies as such, but how we think about emerging biotechnologies. The report is intended to stimulate thinking in a variety of different contexts where conditions that influence emerging biotechnologies are set. But it is a stimulus to thinking in a particular way, namely, thinking that is directed outside that immediate context and orientated by the shared interest in promoting the 'public good'. Its recommendations are therefore largely about the processes of reflection and decision making rather than their content. They are guided by a number of procedural and institutional virtues that underlie the 'public ethics' approach set out in the report.

## Why does the report focus on 'emerging biotechnologies'?

4. In the report we treat technologies as 'conjunctions of knowledges, practices, products and applications'. Biotechnologies involve biological processes, systems or elements within this conjunction. Despite the great diversity of biotechnologies, the conditions that lead to particular conjunctions coming into being in a particular social and historical context while other possible conjunctions do not, raise common sets of issues. These conditions include both natural constraints and voluntary choices (even if those choices are not always recognised or explicit). Such choices depend on complex judgments involving values, beliefs and expectations about the technologies and their uses. How these choices are made – how different values, beliefs and expectations are drawn in, evaluated, incorporated or excluded – just as much as the nature of the considerations involved, have important ethical and political dimensions. Just as choosing the conditions governing emergence is a common issue for biotechnologies it may be equally common to other, non-biological technologies. Several considerations, however, make biotechnologies a particularly appropriate and timely focus.

5. One is that biotechnologies, broadly defined, concern living systems as opposed to inanimate ones. Although this conceptual distinction has variable significance, there are many perspectives that are relevant to social choice and scientific decision making from which it is important.
6. A second reason is historical. The exploitation of the biological sciences is said to be about fifty years behind the exploitation of the physical sciences. Such comparisons have given rise to some ambitious predictions about the productivity of the biosciences, but they also raise questions about the relative complexity, openness and controllability of the systems with which physical and biological sciences deal.
7. A third reason is connected to the expectations that form around emerging biotechnologies, and the political investments that are placed in them. Biotechnology is held up as an important source of future remedies for current challenges and crises, from food and fuel security to environmentally sustainable production, healthcare and economic growth. It is a significant component in current UK industrial strategy and in advancing the UK as a knowledge economy. It is therefore already a significant social choice.
8. Finally, despite the wide range of questions about technology and social choice, as a bioethics council our interests are necessarily orientated towards the biological, although throughout this report we hold in mind the relationship of biotechnologies to other technological fields and, indeed, to alternative approaches to social objectives.

## What is the intended impact of this report?

9. The aim of the report is to cultivate a mode of thinking about and governing emerging biotechnologies that facilitates the balanced engagement between different kinds of norms and values appropriate to the nature of the technologies and the social choices involved, one that properly reflects the public interest in them. This is different from the reflection characteristic of usual ethical assessment of new technologies, which is incorporated as part of a decision process or as a separate initiative associated with major scientific research programmes – for example, in the well-known form of ‘ELSI’ assessments. In conventional ethical assessments, ethical reflection becomes an additional stage in the process, but one that may be already framed by other sorts of values, circumscribed by its place in the sequence of decisions. The kind of reflection this report intends to cultivate is not conceived as an element of the *process* of decision making in technology policy and governance. Instead, the objective is to cultivate ethical reflection as a characteristic of the *context* in which the process of technological research, development and innovation occurs.
10. The procedural virtues we identify are not, therefore, a matter of ‘biotechnology ethics’ but of ‘public ethics’. A public ethics involves a greater engagement with public values (which means determining values in the public sphere). This is not a novel prescription, but nor is it easy to fulfil – we acknowledge that ‘public engagement’ initiatives, for example, are fraught with dilemmas. It is not achieved by amending procedures but by altering behaviours, not just by more public engagement, but by engagement that is more ‘public’ in its nature, engagement that explores public values rather than engagement that expresses private interests.
11. One area in which public ethics can have impact is biotechnology policy. This has traditionally mixed two opposite elements: state intervention, where expert elites decide where to concentrate the resources available for technology development, and market mechanisms that select the technological ‘successes’ (while other approaches and other businesses are left to founder). Both extremes have limitations that are particularly pronounced with complex technologies and innovation systems, such as are typical of biotechnologies. In simple terms, picking winners is vulnerable to uncertainty and markets may fail to distribute resources to produce greatest social value. To a certain extent the hybrid innovation systems in existence for biotechnologies already represent a middle way, but they remain too ‘dirigiste’ in their practice and too ‘laissez faire’ in their values. Bringing public ethics into biotechnology governance is intended to foster a more socially responsible approach to biotechnology governance that introduces social value as a third element in the shaping and selection of the pathway of biotechnology development, alongside elite opinion and market forces.

## Who should read this report?

12. The report is addressed to all those who may participate in shaping the emergence of new biotechnologies. This includes those who have formal responsibility for decision making and those who influence or inform decisions, whether as decision makers, advisors, lobbyists, activists or interested non-specialists. Chapters of the report deal with the involvement in governance of researchers, policy makers, regulators, those working in industry and those with no professional involvement (often designated as 'the public'). The report is intended to help each of these to think beyond the decisions that they face within their immediate context and about how their decisions constrain or frame the decisions of others.
13. However, we hope also that the report reaches a wider readership. Although it is not an explicit objective or a likely outcome of the report to stimulate broader interest in the governance of emerging biotechnologies, it is part of the argument of the report that biotechnology governance is improved by a greater level of social engagement with technology choice. We hope that the report may also, therefore, provide a resource for a more engaged public.