

Constructing and governing citizens in synthetic biology: Comparing the US and UK

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Setting the scene

Synthetic biology reflects a recent and explicit attempt to make biology easier to engineer, and through this to open up the design space of genetic engineering to a wider range of practitioners. So far, there are few commercial products or applications to illustrate this approach to engineering biology. But some transatlantic differences are emerging with respect to the governance of synthetic biology in the US and the UK.

This work explores national approaches to governing synthetic biology, and shows how concerns can become framed in relation to different past experiences with recombinant DNA technology. In the US, the governance of synthetic biology is often articulated in relation to the early days of recombinant DNA, and the self-governance mechanisms pioneered in response to the Asilomar deliberations. In the UK, more recent experiences with GM crops provide a frequent reference point against which governance initiatives are being proposed.

I suggest that these differing sociotechnical imaginaries¹ have implications for how core threats and 'groups of concern' are being defined around synthetic biology, and how measures to contain and govern citizens are being pursued in the US and Britain.

	United States	United Kingdom
Framing experience	Asilomar (success story)	GM crops (failure story)
Groups of concern	Non-biologist scientists; DIY & amateur biologists; rogue individuals	The public
Constitutional focus	Self-governance	Creating common vision
Boundary work	Defining synthetic biologists to make governable scientists	Defining the public to make governable subjects
Risks & policy focus	Biosafety - containing synthetic organisms Biosecurity - preventing rogue penetration of frontier science • Limiting access to materials ⁷ • Defining community norms ^{4,8}	Biosafety - containing synthetic organisms Pursuit of innovation - preventing rejection of normal science • Public engagement and dialogue ⁹ • Defining the 'public good' ¹⁰
Social contract	Safeguarding the ability of the research community to define scientific priorities	Growing pressure to integrate scientific and public values to guide scientific priorities

Comparison of early US and UK approaches to governing synthetic biology. These approaches are grounded in different past experiences that frame the identification of different 'groups of concern'. Superscripts denote example reports illustrating different governance strategies.

Summary

- In the US and the UK, different past experiences with recombinant DNA technology are framing the construction of different 'groups of concern'
- Different governance strategies are being pursued to contain the threat of amateur biologists (US) or a potentially unruly public (UK)
- Transatlantic differences in early governance strategies reflect broader negotiations of rights and responsibilities among scientists, citizens and the state

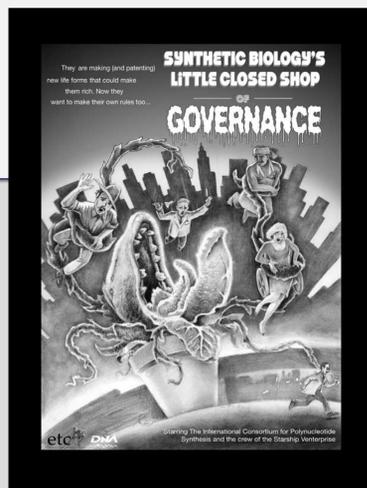
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US Case Study: Governing amateur biologists

In the US, the 1975 Asilomar meeting on recombinant DNA is often held up as a success story for how a group of responsible scientists identified potential risks associated with a new technology and took steps to implement self-governance mechanisms.² It has also become a key reference point for imagining how the promises of synthetic biology might be realized and its threats contained. Importantly, this framing grants the research community considerable authority in identifying potential benefits and threats associated with new technologies.

Neither the biosecurity dimensions nor the 'social and ethical implications' of genetic engineering were discussed at Asilomar. The risks addressed were limited to laboratory biohazards and the design of technical solutions for preventing escape of engineered organisms that might cause harm to researchers or the environment.³ However, the potential biosecurity and dual-use implications of synthetic biology have emerged as an important governance issue in the US.



Self-governance by scientists is something the ETC Group identified and objected to in a poster they displayed at the SB3.0 synthetic biology conference (Zurich, 2007)⁵

A key challenge is that synthetic biology is starting to expand beyond the traditional physical barriers of the laboratory, and beyond the academic molecular biology community. New actors (including engineers, computer scientists and amateur biologists) are entering the field of synthetic biology, and are challenging the Asilomar imaginary of a clearly bounded, self-governing community. Amateur biologists and citizen scientists are being identified as potential innovators with rights and 'freedom of inquiry'⁴, but also simultaneously as possible 'groups of concern' from a biosecurity perspective. Several early governance initiatives in the US involve trying to define and secure the boundaries around this evolving synthetic biology community, to make its 'legitimate' members fit within existing (self-)governance mechanisms while excluding 'rogue' actors.

UK Case Study: Governing an unruly public

Compared with the US, the threat of public rejection of synthetic biology is discussed more frequently than the prospect of biosecurity threats. The controversy over GM crops looms large in UK discussions of synthetic biology. Abstracting from the GM crop experience in the 1990s, UK policymakers consistently single out regulatory transparency, public engagement and dialogue as key requirements for maintaining public legitimacy and support for synthetic biology. In the UK, it is not amateur biologists or rogue individuals who have been identified as groups of concern, but the potentially unruly public-at-large that has become the target of early efforts at governance and containment.

Creating 'common vision'⁶ across scientists and 'the public' is seen as an important strategy to manage this threat associated with synthetic biology. The UK Research Councils are becoming increasingly active intermediaries in fostering dialogue and debate. They are pursuing strategies like sponsoring public dialogue activities that bring public views into deliberative channels further upstream in the scientific process. With such approaches, we see the deliberate construction of representative and 'legitimate' publics who are invited to participate in exercises framed by scientists and funders. Key tensions involve how to simultaneously elicit and contain public views about defining the risks of synthetic biology, and to manage this process so as to yield empowered citizens whose views align with the state and its scientists.

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