

Key messages

- Responsible research and innovation (RRI) is an experiment in reshaping the future
- Diverse meanings of RRI in policy and practice
- RRI challenges existing practices – makes science a site of politics
- In practice, RRI may ‘open up’ or ‘close down’ opportunities to reshape the future
- Struggle over meanings

Synthetic biology: Reshaping the future?

- Is synthetic biology reshaping the future?:
 - Innovations from synthetic biology are accompanied by environmental, social and ethical risks. How can we anticipate and manage these risks?
- In response to synthetic biology, should we reshape the future?:
 - How can this emerging technology be responsibly developed for the benefit of society?

So what is 'responsible research and innovation?'

Responsible research and innovation (RRI) is concerned with the **substance** and **direction** of research and innovation:

What it can do for society and **who gets to decide.**

It connects synthetic biology to current problems and priorities in society

Meanings of RRI in policy

RRI means that societal actors work together during the whole research and innovation process in order to better align both the process and its outcomes, with the values, needs and expectations of European society.

European Commission

RRI in UK policy

EPSRC

Engineering and Physical Sciences
Research Council



UK Trade
& Investment

Innovate UK

Technology Strategy Board



The University of
Nottingham

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Research	>
Framework for Responsible Innovation	>
Anticipate, reflect, engage and act (AREA)	
Support	
Expectations	
Acknowledgements and resources	

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Anticipate, reflect, engage and act (AREA)

A Responsible Innovation approach should be one that continuously seeks to:

Anticipate – describing and analysing the impacts, intended or otherwise, (for example economic, social, environmental) that might arise. This does not seek to predict but rather to support an exploration of possible impacts and implications that may otherwise remain uncovered and little discussed.

Reflect – reflecting on the purposes of, motivations for and potential implications of the research, and the associated uncertainties, areas of ignorance, assumptions, framings, questions, dilemmas and social transformations these may bring.

Engage – opening up such visions, impacts and questioning to broader deliberation, dialogue, engagement and debate in an inclusive way.

Act – using these processes to influence the direction and trajectory of the research and innovation process itself.

Some of the skill sets required to enact the **AREA** framework will be unfamiliar to some of our community and we have outlined [some further resources](#) that may be of use. For Responsible Innovation to take place in a meaningful way, it will be important that we and our researchers nurture and promote partnerships with other disciplines and spheres of expertise and facilitate training to enable these skills to be developed and taken forward. This might, for example, involve integrated approaches and collaborative research involving social and environmental scientists, ethicists and engagement practitioners.

Share:



RRI in SynbiCITE

SynbiCITE is the UK's national centre for the commercialisation of synthetic biology – (an Innovation and Knowledge Centre).

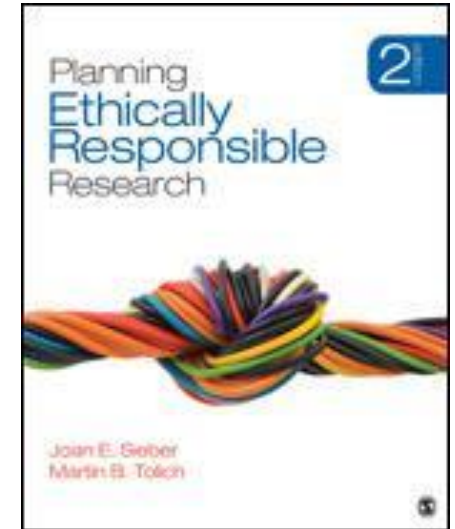
Engagement

We engage with the public to discuss synthetic biology, its applications, possibilities, benefits and potential. We encourage our partners to engage in public dialogue and stress the importance of explaining clearly: what they are doing, why they are doing it, what the potential public benefits are, what the potential risks are, and how these are being addressed. We stress the need to avoid overstatements as to the benefits and timescale of their work.

RRI in the Roadmap

Our vision is of a UK synthetic biology sector that is of clear public benefit: an exemplar of responsible innovation, incorporating the views of a range of stakeholders and addressing global societal and environmental challenges within an effective, appropriate and responsive regulatory framework.

What does RRI *look like* once transferred from policy into research?



Meanings of RRI in practice

1. Public outreach
 - Securing support or preparing for dialogue?
2. Interdisciplinary involvement
 - Outsourcing or integrating RRI?
3. Stakeholder involvement
 - Excluding or integrating stakeholders?
4. Training and education
 - Negotiating the new landscape or achieving cultural change?



What *should* RRI look like?

- **Public outreach**
 - Provides information as a foundation for public engagement
- **Interdisciplinary involvement**
 - Empowers SSH researchers to contribute to scientific research
- **Stakeholder involvement**
 - Engages stakeholders as experts with valuable knowledge to contribute to scientific research
- **Training and education**
 - Develops ‘social-leaning’ scientists over the long term

Challenges and tensions

- RRI harnessed to depoliticise science (to avoid repeat of GM crisis) and politicise it
- Role of universities (interdisciplinarity)
- Deficit model
- Stakeholder engagement (NGOs, identification, mechanisms)
- Privileging economic benefits (pressures to commercialise, bioeconomy)



Conclusions

- RRI is an experiment in reshaping the future
- Diverse meanings of RRI in policy and practice
- RRI challenges existing practices – makes science a site of politics
- In practice, RRI may ‘open up’ or ‘close down’ opportunities to reshape the future
- Struggle over meanings (and values)