Towards Imperfection: Science Communication, Dialogue and Interdisciplinarity in Synthetic Biology

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This paper is concerned with the form that collective reflection on synthetic biology should take. It draws on our experiences working with natural scientists and project managers in synthetic biology to develop an interactive, dialogic – but also informative – installation in order to reflect on the challenges and opportunities that such interdisciplinary work presents.

We take as our starting point for this paper the understanding that synthetic biology is an exciting field of research, but that there are a diverse set of imaginaries of how this field can and should be used to make a better society (Balmer and Wood 2008; Yearley 2009). In order to develop the field in a robust way, we need to make sure that all of these imaginaries are heard and taken into consideration.

We therefore take for granted that synthetic biology, in its practice and policy, should be ‘opened up’ to broad societal debate (Stirling 2008). It should be interrogated from a wide range of perspectives, including those from lay publics, diverse stakeholders, the humanities and social sciences, and the natural sciences themselves (Balmer et al 2012).

Such an integrative agenda is, however, highly costly for all involved, with regard to finances, time, personal comfort, and intellectual autonomy. It places significant demands on individuals and research projects, may be read as intrusive by natural scientists and uninteresting by lay publics, and calls into question the very nature of interdisciplinary engagement (Fitzgerald et al 2014; Rabinow and Bennett 2012). Previous experience – with synthetic biology and other emerging technologies, as well as with European moves towards the use of frameworks for ‘Responsible Research and Innovation’ (Koops et al in press) – indicates that such integration will be difficult to establish top-down.

Our central argument is that we need to acknowledge the challenges that integration presents. It is important for ‘us’ (here: social researchers and policy makers) to take into account that we are working under conditions that preclude ideal-type deliberation, or collaboration. We need to embrace the imperfections of the systems we work within.

Our experience has been that integration agendas are most productively implemented on the small scale, through seemingly mundane things such as personal friendships, moments of patience and generosity, and the shared experience of institutional or organisational demands (such as communication activities or reporting; cf Fitzgerald et al 2014). Rather than seeking to impose reflection and dialogue through top-down frameworks or projects, the other option is thus to support it from the bottom-up, performing and collecting various smaller-scale experiments that contribute to this integrative agenda. None of these experiments will be ideal: they may involve misimaginations of publics, the dominance of traditionally powerful actors, or simple failure to meet their aims. But such imperfect engagements may still open up spaces for shared reflection and for change.
As an example we want to reflect on practices of science communication. STS scholarship has tended to focus on public and stakeholder engagement that seeks to inform, as directly as possible, scientific practice or policy (PitlikZillig and Tomkins 2011); science communication, on the other hand, is often informal, small-scale, and *ad-hoc*. Its practice – as part of a process of engaged and reflective research – raises a number of interesting questions as to how synthetic biology may be productively ‘opened up’ at the local level.

It demands, for instance, that we find forms of communication that make scientists and other scholars work together. The tendency to establish a division of labour such that scientists are in charge of the science, and scholars for social science and humanities are in charge of the ‘other stuff’ (ethics, societal implications, public views, communication…), is detrimental for integrated public discussion of how we want to develop synthetic biology. We therefore need to take seriously the needs and desires of our natural science partners as well as questions of how best to open up their science to integrative debate. We will also need to develop new methods of science communication which integrate what has traditionally been seen as divided: dissemination, diffusion and other one-way communication formats with dialogue, engagement, democratic discussion and openness.

We also need to think of science communication as something that is not just about communication, but which concerns the practice of science itself. Public communication shapes expectations of what types of research society should invest in: in this sense, science communication is part of the big business of science and should be acknowledged as such. Communication is performative, and will change how synthetic biology is imagined by ourselves and others. Similarly, science communication is an identity-shaping activity. Synthetic biology, because of its potentially controversial nature, has the potential to be exemplary of discussions of what type of activity science is – and of what type of actors scientists are. Again, communication of synthetic biology will perform diverse identities, including the nature of scientific citizenship, scientific organisations and scientific nations.

Finally, science communication teaches us that non-scientists have a diverse set of reasons for engaging with science, and use and re-shape scientific knowledge in a variety of ways. We will therefore need to think about public communication about synthetic biology in a way that acknowledges and meets these reasons, taking seriously, for instance, the thrill of spectacle, a hunger for usable knowledge, or the co-option of communication for individuals’ own identity-forming practices.

Science communication, in our experience, offers opportunities to build long-term collaborative relationships between scholars from different disciplines, as well as to enable space for diverse forms of public debate. Its practice requires some level of comfort with the imperfect – flawed public dialogue, dubious motives, or the ‘selling’ of science. But our point has been that it is better to thoughtfully work with the imperfect than attempt to impose an idealised model of integration that is ultimately unrealisable.

See english.breaking-entering.dk for an account of one experiment in communicating synthetic biology.