



# The BBSRC's Synthetic Biology Dialogue and Newcastle University's 2017 iGEM Project

By Newcastle University iGEM Team





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## Introduction

In 2010 the Biotechnology and Biological Sciences Research Council (BBSRC) completed the Synthetic Biology Dialogue: a dialogue with the public and stakeholders discussing how they understand synthetic biology, its impact, and its applications. Telephone interviews with stakeholders and workshops with members of the public were used to gain diverse perspectives. A report detailing the outcomes of the dialogue, *Synthetic Biology Dialogue*, was compiled. This can be accessed at <http://www.bbsrc.ac.uk/documents/1006-synthetic-biology-dialogue-pdf/>, and will be referred to throughout this report.

As the Newcastle University 2017 iGEM team, before starting our human practises and education and public engagement activities, we wanted to gain an idea of previous work that had been done in understanding public and stakeholder attitudes to synthetic biology. This is important because these are the people who will be impacted by and benefit from our project. The BBSRC's Synthetic Biology Dialogue has therefore been incredibly important in informing our project. Synthetic Biology Dialogue has provided a foundation, so that at each stage of design and development we hold the existing opinions of the public and stakeholders in mind, and caused us to consider how our work can impact these opinions. The Synthetic Biology Dialogue also served as inspiration for the corpus linguistics research we completed (*A Corpus Based Investigation into Science Communication*), as this has been used to further investigate points raised during the dialogue.

This report provides an overview of how the Synthetic Biology Dialogue has impacted our work, and how particular points raised in the dialogue have been considered and furthered throughout the development of our project. Taking account of the concerns raised by the public and stakeholders in the Synthetic Biology Dialogue has helped us ensure our work truly is good for the world!

## The Dialogue

In *Synthetic Biology Dialogue*, it is noted that participants were aware of the role of the media in influencing opinions on new technology, with synthetic biology being no exception: '[participants] were concerned that the media would hijack any debate, and that potential benefits may be lost, with parallels highlighted in relation to media coverage of stem cell research' (BBSRC 2010: 36).

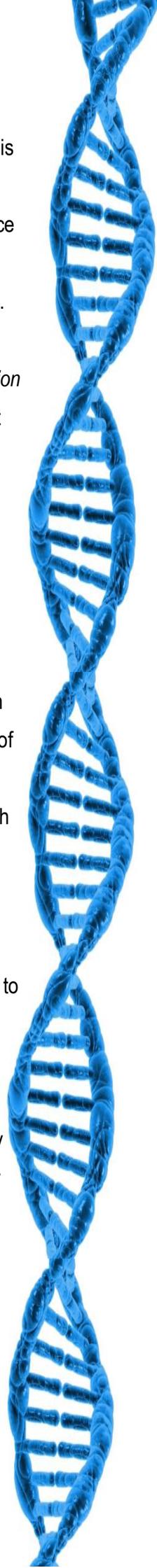
This quote inspired us to use corpus linguistics to investigate how the media does cover synthetic biology and related topics. By using a corpus which collects news stories which have been published

online, we could analyse and look for patterns in language use in a large collection of media texts. This corpus allows you to search for the occurrence of certain words and phrases, for example *synthetic biology*, in all of the texts which it contains. Consequently, an overview of how the media may influence debate around synthetic biology, with evidence from published texts, has been gained. Our report *A Corpus Based Investigation into Science Communication* covers the findings of this research in detail. Overall, this research showed that the media reports on synthetic biology in both a positive and negative light (see section 3.1.3, pp. 9-12 of *A Corpus Based Investigation into Science Communication* for more detail). The worldwide impact that synthetic biology can have is highlighted in the media, but this is often painted in a negative light. For example, the report features a quote which suggests synthetic biology could create a 'global pandemic'. This further verifies concerns the public may have about the role of the media in engagement with synthetic biology.

In section 4.2.2 of *Synthetic Biology Dialogue*, which focuses on agri-environmental applications of synthetic biology, food was the main point of discussion, specifically GM crops: 'GM crops were discussed in this context [of foods being tampered with]. Participants were broadly split as to the pros and cons of this technology' (BBSRC 2010: 30). Again, these viewpoints were found to be reflected in the corpus research. We also completed a search for *GMO* in the corpus (see section 3.2, pp. 12-14 of *A Corpus Based Investigation into Science Communication* for more detail). This search and analysis showed that most of the media reports featuring GMOs also centred on the use of GMOs in food. Both positive and negative evaluation was used in reporting on GMOs: words like *global* are included with discussion of whether GMOs could help solve food shortages, but *safe* and *human* were associated with GMOs because of questioning their impact on human health.

*Synthetic Biology Dialogue* also shows how the public will use concepts they are already familiar with to relate synthetic biology to, in order to understand it: 'when considering food/crop applications, participants related to this application in terms of GM foods and crops.' (BBSRC 2010: 61). This was also reflected in the corpus research. When searches for *Genetic Engineering* and *Synthetic Biology* were completed in the corpus, the analysis determined that genetic engineering, which is more widely understood than synthetic biology, was often referred to in order to define or explain synthetic biology (see section 3.1.3, pp. 9-12 of *A Corpus Based Investigation into Science Communication* for more detail).

A recurring point made by the public in the dialogue was a desire for transparency. In order to fully understand the new technology, the public felt scientists needed to be open and honest about their work and in how they engage with the public. Our investigation into science communication is





purposeful to increase the transparency in how our work is communicated, as we have gained a better understanding of how language is currently used in communicating synthetic biology to the public, and then used this to produce guidelines for communicating synthetic biology (see *Breaking down the barriers: How should we communicate SynBio to the public?*). In addition, the BBSRC report notes that 'participants also perceived a distance of scientists from public needs. They regarded scientists as so focused on the research and technical questions, that they miss the social significance of their work' (BBSRC 2010:35). By maintaining a focus on integrated human practises throughout (see discussions described on our Gold and Integrated Human Practises page), we are ensuring the social significance of our work is at the forefront of all design and progress in our project.

Some of the most prominent and frequent concerns emerging from the dialogue were surrounding regulation of synthetic biology. More specifically, the release of synthetic organisms into the environment, international regulation, and the practicalities of global standards were questioned. The report states that '[g]lobalised markets and the potential to source materials, equipment and know-how from many countries meant international controls and regulation were vital [...] many participants were sceptical as to whether effective global control could be achieved' (BBSRC 2010: 44). Referring back to the corpus research, *international* and *global* are words which frequently occur around *synthetic biology*. This further backs up how the control of synthetic biology across the globe is a key public concern, as it regularly features in media reports about synthetic biology (see section 3.1.3, p. 10-11 for more detail).

## Conclusion

A final quote from *Synthetic Biology Dialogue* is apt for summarising this report: 'future dialogue is not just about talking to the public in processes like this; it is also about embedding public views on synthetic biology in the cultures and practises of research' (BBSRC 2010: 89). The Synthetic Biology Dialogue showed that stakeholders and the public value not only their opinions being listened to, but more importantly them being integrated into research and developments. With the integrated human practises, and education and public engagement work in our iGEM project, we aim to ensure this is what happens.

## List of References

BBSRC. *Synthetic Biology Dialogue*. 2010. Accessed at: <http://www.bbsrc.ac.uk/documents/1006-synthetic-biology-dialogue-pdf/>