



Political science

UK Synthetic Biology Centres tasked with addressing public concerns

An extra £40m for synthetic biology research in the UK comes with support to encourage responsible innovation. Social media analysis offers a heads up on new research ideas and potential public concerns

Philip Shapira & Abdullah Gök

Fri 30 Jan 2015 10.00 GMT

UK's business secretary Vince Cable was at the University of Manchester on Thursday to **announce £40m in new research funding** for synthetic biology, including £32m for Synthetic Biology Research Centres (SBRCs) in Manchester, Edinburgh, and Warwick.

This is another major boost for synthetic biology research, joining three other SBRCs in Bristol, Cambridge, and Nottingham and a Synthetic **Biology** Innovation and Knowledge Centre at Imperial College London set up in 2014.

The UK's substantial public investment in synthetic biology - about £200m - largely fulfils the recommendation of the **2012 roadmap for synthetic biology** to establish a network of centres and to build a critical mass of research. There is evidence that this research strategy is delivering outputs: the UK produces about 12% of the world's scientific papers in synthetic biology, second only to the US and significantly ahead of Germany and, for the time being, China.

This funding is a big step along the way to building the knowledge base that can lead to commercially valuable new processes and products. Champions of synthetic biology expect the field to radically restructure many existing industries and create significant new ones. The potential applications of synthetic biology span many sectors: from engineered plants in agriculture and synthetic biofuels in energy to synthetically designed natural fragrances in fine chemicals and rapid synthesis to speed up vaccine development in healthcare.

However, there are also concerns over the ethical implications of scientific techniques - redesigning biological components and systems found in the natural world or making new ones from scratch - used in synthetic biology. These include the ethics of engineering nature, potential environmental, health and safety risks associated with synthetically-engineered organisms, concerns about ownership and control, and effects on existing sectors and workforces.

Responding to public concerns about synthetic biology

Recognising that synthetic biology raises a series of societal issues, the Biotechnology and Biological Sciences Research Council (BBSRC) has required that considerations of responsible research and innovation be embedded in each of the new SBRCs it funds. This builds on recent work by **scholars**, the **European Union**, and other organisations including the **BBSRC** and **other UK research councils**, to establish dialogue about, and frameworks for responsibility in synthetic biology and other emerging

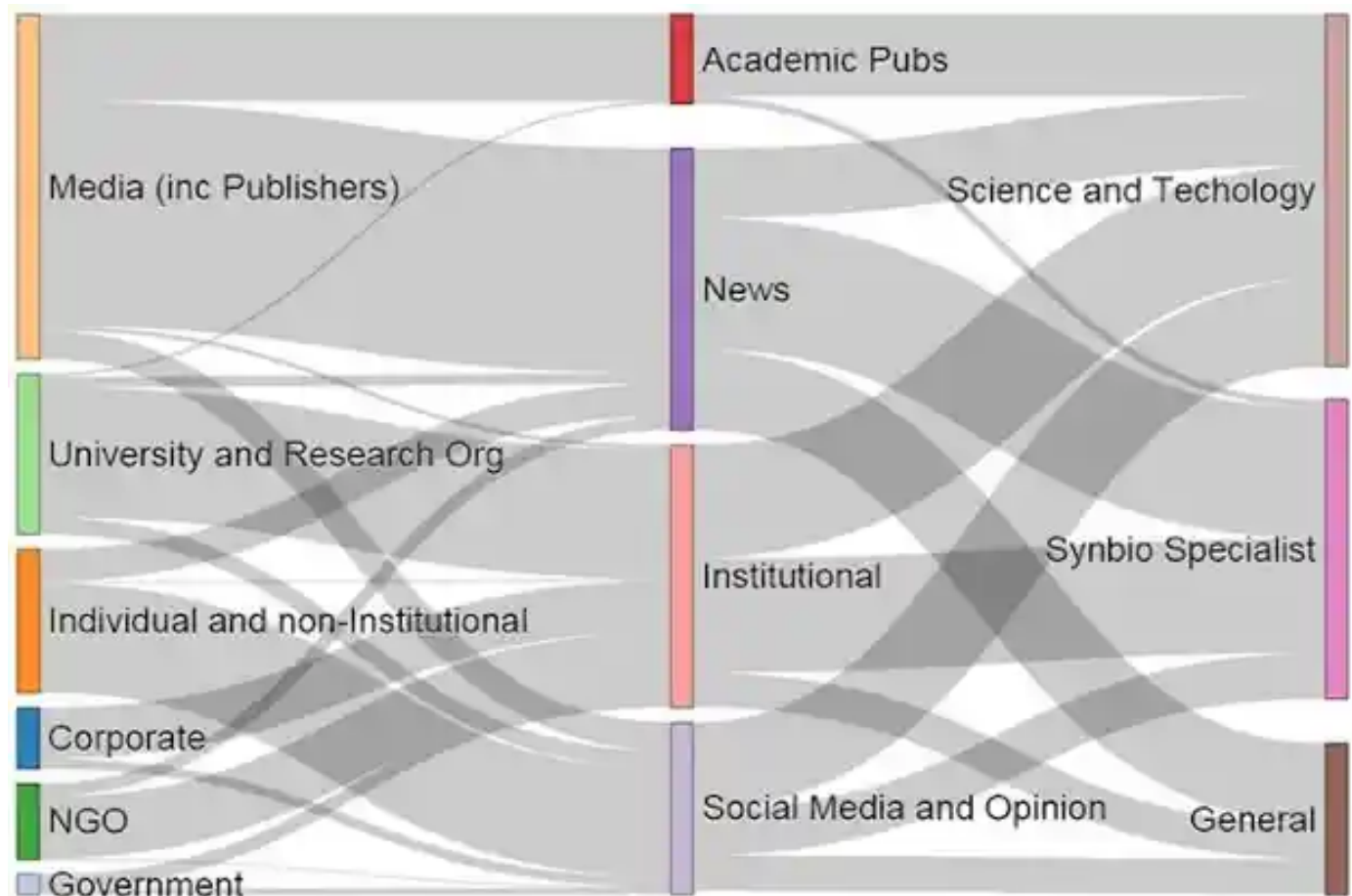
technologies. Responsible research and innovation must involve scientists, as they design and develop their research. Engagement must also extend outside the lab to companies, policy makers and regulators, interest and non-profit groups, and to the public.

We are social scientists embedded in Manchester's SBRC - the Centre for Synthetic Biology of Fine and Speciality Chemicals - and will take part in initiatives to highlight concerns in upstream research and development phases, as well as in downstream innovation. This will involve engaging with and understanding the perspectives of many different organisations and citizens who could be affected by the ongoing progress in synthetic biology.

In [recent research](#) we have sought to get a "heads up" on the nature of discussion about synthetic biology through analysing social media discussions and related web sites. In this pilot, we analysed nearly 21,000 tweets on the topic of synthetic biology posted by more than 8,200 unique users worldwide (in English) between January and May 2014. Since nearly nine in 10 tweets about synthetic biology refer to a web page, we also looked at the detailed information on those pages. Using text mining methods, we were able to categorise the internet resources people refer to in their social media conversations.

What social media says about synthetic biology

Much discussion to date about synthetic biology (in about two-thirds of the webpages we analysed) is posted on specialist science, technology or synthetic biology websites. About half of all websites provide institutional and scientific information related to synthetic biology, the other half present news and opinion. Most websites discussing synthetic biology belong to universities, academic publishers and government organisations.



Categories of website discussing synthetic biology Illustration: A. Gok/University of Manchester

As yet, we cannot say that public social media discussion about synthetic biology is widespread. Still, around one-third of the sites that we analysed are operated by individuals, non-governmental organisations, and companies. As commercial applications of synthetic biology emerge, we might anticipate more presentation related to synthetic biology on corporate sites, even though there are likely to be companies that may not publicly disclose all details.

The potential applications discussed in social media (predominantly by specialists in the field) extend broadly. Medical and healthcare applications (about one-fifth of all application references) slightly edge out others, followed by applications related to energy and environment, food and agriculture, and consumer products.

Discussion about synthetic biology in resource, intermediate, and consumer sectors surely suggests policymakers and other stakeholders will need to consider how regulatory systems deal with the variety and diversity of applications. Military and non-peaceful applications of synthetic biology are discussed in only about five percent of webpages.

The safety of synthetic biology is a prominent issue, highlighted in about two-fifths of webpages linked to synthetic biology tweets. Ethical concerns and issues related to fairness and social justice are each discussed in around 20% of webpages. About one-tenth of webpages raise other issues including concerns related to hubris and religion. Again, there is a signal here to scientists and policymakers - and to companies seeking to commercialise synthetic biology - don't just talk over safety, ethical, and other concerns, but also act to address the issues raised early on so that innovations can be shaped to ensure responsible approaches and solutions.

Philip Shapira is professor of innovation, management and policy at the [Manchester Institute of Innovation Research](#), Manchester Business School, University of Manchester, and a professor of public policy at Georgia Institute of Technology. He is a director of the Manchester-Atlanta-Beijing Innovation Co-Lab and a co-investigator with the BBSRC [Centre for Synthetic Biology of Fine and Speciality Chemicals](#) at the University of Manchester. He tweets as [@philipshapira](#).

Abdullah Gök is a research fellow at the [Manchester Institute of Innovation Research](#), Manchester Business School, University of Manchester. He is also affiliated with the BBSRC [Centre for Synthetic Biology of Fine and Speciality Chemicals](#) at the University of Manchester. He tweets as [@abgok](#).

Article count [on](#)

You've read 13 articles in the last year

... as 2023 gathers pace, we have a small favour to ask. A new year means new opportunities, and we're hoping this year gives rise to some much-needed stability and progress. Whatever happens, the Guardian will be there, providing clarity and fearless, independent reporting from around the world, 24/7.

Times are tough, and we know not everyone is in a position to pay for news. But as we're reader-funded, we rely on the ongoing generosity of those who can afford it. This vital support means millions can continue to read reliable reporting on the events shaping our world. [Will you invest in the Guardian this year?](#)

Unlike many others, we have no billionaire owner, meaning we can fearlessly chase the truth and report it with integrity. 2023 will be no different; we will work with trademark determination and passion to bring you journalism that's always free from commercial or political interference. No one edits our editor or diverts our attention from what's most important.

With your support, we'll continue to keep Guardian journalism open and free for everyone to read. When access to information is made equal, greater numbers of people can understand global events and their impact on people and communities. Together, we can demand better from the powerful and fight for democracy.

Whether you give a little or a lot, your funding will power our reporting for the years to come. **Support the Guardian once from just £1. If you can, please support us with a regular amount each month. When you give a little more on a regular basis, you'll unlock exclusive extras, including full access to our app and ad-free reading. Thank you.**

Single	Monthly	Annual
£3 per month	£5 per month	Other

Continue →

Remind me in March

VISA



Political science



Why is populism suddenly all the rage?

20 Nov 2018



From diet pills to driverless cars: why we need to debate the politics of science and technology

3 Sept 2018 34



A no-deal Brexit will betray British science

28 Aug 2018 1,369



Is UK science and innovation up for the climate challenge?

16 Jul 2018



It's time for biomedical research

12 Jul 2018

More from Headlines



Live / No 10 rejects claims from Nadhim Zahawi allies that inquiry that led to his sacking was rushed

33m ago 5,093



Exclusive / Tory peer accused of 'racially charged' attack on BBC Modi documentary

2h ago



Pakistan / Dozens killed in mosque blast in Peshawar

5h ago



Marie Kondo / Queen of clean says she has 'kind of given up' on tidying at home

2h ago



Teachers' strike: minute to avert s and Wales

2h ago

comments (2)

This discussion is now closed for comments but you can still [sign in](#) or [create your Guardian account](#) to join the discussion next time

Sort by Oldest Per page 100 Display threads Collapsed



Holmer 31 Jan 2015 16.52

0 ↑

"As yet, we cannot say that public social media discussion about synthetic biology is widespread."

This is the first I've heard of it, and I think (thought) I'm knowledgeable and well-informed about science and ethics!

We need more discussion in the main media rather than among scientists and their Twitterati friends

[Report](#)



User569852 2 Feb 2015 9.54

0 ↑

There have been attempts to deal with anticipated security concerns related to synthetic biology for over 10 years. How well have we done? <http://biochemsec2030.org/2014/08/04/taking-stock-of-security-concerns-related-to-synthetic-biology-in-an-age-of-responsible-innovation-2/>

[Report](#)

Most viewed