BIS | Department for Business Innovation & Skills

The Rt Hon David Willetts MP
Minister for Universities and Science

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2 November 2012

Dear Lionel,

RESPONSE TO 'A SYNTHETIC BIOLOGY ROADMAP FOR THE UK'

This open letter is to convey the Government's response to the findings and recommendations of the Synthetic Biology Roadmap Coordinating Group that you chaired. I am most grateful to you and all of the Roadmap Coordinating Group members for producing such an excellent and well-researched Roadmap.

The Roadmap highlights a number of possible measures that complement the strategic view I expressed at the University of East Anglia, when I stated that: "Synthetic biology could provide solutions to many of humanity's most pressing issues and at the same time presents significant growth opportunities." I trust that you will find the following a constructive response towards achieving the aims of your Roadmap and one which we will be able to effectively deliver through the Leadership Council that we have both agreed to jointly Chair.

Taking your Group's five recommendations in turn:-

1. **Invest in a network of multidisciplinary centres to establish an outstanding UK synthetic biology resource and**
2. **Build a skilled, energised and well-funded UK-wide synthetic biology community**

The Government agrees that for synthetic biology to become a successful industry sector in the UK it will be important to facilitate communications and learning, and the networking of experts across disciplines with customers, the public and private interest groups. The Leadership Council will provide a strategic forum for considered discussion of these issues.

The Research Councils began in 2007 to establish a network for a synthetic biology research community. The University of Bristol, Durham University, the University of Edinburgh, University College London & Birkbeck College, the University of Nottingham, the University of Oxford and the University of Sheffield were beneficiaries of a £900,000 investment. The network have used this funding to build multidisciplinary links between the UK's leading laboratories and to begin to develop the tools required for synthetic biology research. The UK continues to invest in support for networking through the Synthetic Biology Special Interest Group (SIG) established in the TSB's Biosciences Knowledge Transfer Network (KTN).

The Research Councils have also been investing, since 2008, in strengthening the UK synthetic biology research community's capability. Notable past investments beyond individual basic research grants include:

- Biotechnology and Biological Sciences Research Council's (BBSRC's) 'Engineering Photosynthesis' ideas laboratory workshop and £6M research grant funding (jointly with the US National Science Foundation (NSF)).

- Engineering and Physical Sciences Research Council's (EPSRC's) £4.7M investment in Imperial College's Centre for Synthetic Biology and Innovation.

- EPSRC/NSF's joint IDEAs Factory sandpit workshop on 'New Directions in Synthetic Biology' and the co-award of £6M research funding to five projects.

- BBSRC and EPSRC investment in the application of synthetic biology research to industrial sectors including energy, industrial biotechnology and healthcare.

Recent boosts to investment in 2012:

- BBSRC's £4M investment in the Universities of Oxford and Southampton to develop a new platform technology for producing synthetic DNA and RNA.

- EPSRC's £5M of funding to 'The Flowers Consortium', (the universities of Cambridge, Edinburgh, Imperial and King's Colleges London and Newcastle) to help establish platform technologies that will be crucial for the next step necessary for applications to be produced and commercialised.

The Roadmap and the activities that will flow from it will build on this groundwork; facilitating further research but also enabling the commercialisation of research. We will ensure that academics and industry can realise the full potential of this exciting area of science.

3. Invest to accelerate technology responsibly to market

The Government recognises that it is too early to predict in which industries synthetic biology will have the greatest impact. We must allow industry to see the commercial opportunities of utilising this technology as its relevance to particular markets emerges. Government's role will be to continue to create the climate in which the research and initiatives described above may flourish.

Work has already begun. In May 2012 the Government boosted innovation to stimulate growth in synthetic biology by investing some £6.5M to encourage businesses to explore new industrial applications for synthetic biology. Through grants for feasibility studies, the funding aims to demonstrate the feasibility of using synthetic biology in a commercial setting and highlight the opportunities for UK industry. The initiative is funded by the Technology Strategy Board (TSB), the BBSRC, the EPSRC and the Economic and Social Research Council (ESRC), and is part of the TSB's programme for emerging technologies and industries.

Clearly, the UK has some good groundwork in place, but, the Government acknowledges that synthetic biology is so important a technology that we need to build on this foundation further. As a next step in that process, I am delighted to inform you today that the BBSRC will now be funding, to the sum of over £20M, several large synthetic biology related projects in the UK research community.

Furthermore, I am pleased that collaboration has been continuing between the Research Councils and the TSB to take forward the Roadmap's recommendations. The Research Councils and TSB will shortly be announcing a public call for expressions of interest to deliver an Innovation and Knowledge Centre (IKC) for Synthetic Biology, as called for in the Roadmap. This will allow pre-market collaboration between academia and industry to help ensure alignment between basic science and industry need. The IKC will complement other TSB-led investments such as its collaborative Research and Development programmes and the recently launched Synthetic Biology Feasibility Studies.

We have begun the strategically important process of addressing the technology infrastructure requirements identified by the Roadmap, but we recognise that we will need to address the 'softer' issues as well. Understanding how society at large views the potential benefits, but also the perceived risks, of synthetic biology is important. For this reason the Research Councils undertook a dialogue on synthetic biology, published in June 2010. The Roadmap's recognition of the importance of ethics and continued social

responsibility towards the safe development of synthetic biology is an approach that the Government welcomes. For the first time the TSB has introduced the use of a Responsible Innovation Framework to help assess the ethical, societal and legal issues as part of the above mentioned call for £6.5M.

4. Assume a leading international role

The Government's investment through the TSB and Research Councils has allowed the UK to develop an internationally recognised world leading synthetic biology research base. This was demonstrated by the UK's leading role in the recent series of six academies' symposia on synthetic biology, which started in London and moved to the other two global leaders: China and the U.S.. Collaboration with the EU will also become an increasingly important aspect to developing this field. The BBSRC is leading the UK's involvement in ERA-NET in Synthetic Biology (ERASynBio), launched in January this year. This three year project is funded by the 7th Framework Programme and aims to enhance synthetic biology across Europe by coordinating national funding, community building, training, and addressing ethical, legal, social and infrastructural needs.

Other recent developments include supporting UK–US research partnership by developing 'majority funder rules' between the Research Councils (EPSRC, BBSRC) and the NSF. This process will support follow-on collaborative projects and is being piloted on the five projects funded from the EPSRC / NSF IDEAs Factory in synthetic biology.

Future international opportunities will reinforce the UK's strong interest and leading role in the development of synthetic biology including, at the appropriate time, the formulation of international standards and safeguards.

5. Establish a Leadership Council

As I mentioned at the outset, the Government, as announced by the Chancellor at Imperial College, will establish a Leadership Council and it will be jointly chaired by you, as Chairman of the former Roadmap Coordinating Group, and me. A first meeting of the Leadership Council is expected before 2013. As recommended, the Leadership Council will provide a visible point for strategic coordination between the funding agencies, the research community, industry and other stakeholders including societal and ethical representatives.

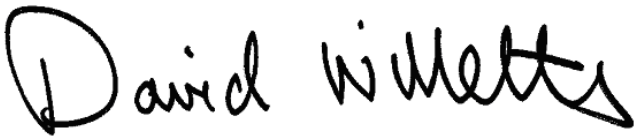
The Leadership Council will be able to consider the case for establishing a number of networked additional centres to boost the national research capacity and diversify our expertise, stimulate innovation and facilitate interfaces with industry and other key stakeholders. This will include their relationship to the IKC, which may act as a 'hub' to help forge the necessary interface between academia and industry during the early stages of development of the technology.

As stated above, the Roadmap rightly defines the development of responsible innovation in this field as a key component. Although, there are ‘grass roots’ drivers of this approach such as iGEM, there is a need for co-ordinated activity to ensure that responsible innovation becomes embedded; therefore, the Leadership Council will need to establish this as one of it priority areas.

In summary, the Government will be pleased to work with the Leadership Council to continue this important work, and to ensure that the UK plays a leading role in key international areas such as international standards, intellectual property and regulations.

I will be personally pleased to work closely with you to take this important agenda forward, since I know how much you believe in its strategic importance as well.

Yours truly,



THE RT HON DAVID WILLETTS MP