Synthetic Biology Leadership Council
Draft minutes of the meeting held on Thursday 13th December
Ministerial Conference Room B, BIS,
1 Victoria Street, London, SW1H 0ET

In attendance:

Co-chairs: Dr Lionel Clarke (Shell Global Solutions); Rt Hon David Willetts (BIS)

Leadership Council: Prof. Janet Bainbridge (UKTI); Carol Boyer-Spooner (Chemistry Innovation Knowledge Transfer Network); Dr Amanda Collis (RCUK); Dr Belinda Clarke (Technology Strategy Board); Dr Simon Dolan (GlaxoSmithKline); Prof. Richard Kitney (Imperial College London); Dr Sarah O'Connor (John Innes Centre); Prof. Joyce Tait (ESRC Innogen Centre, University of Edinburgh); Dr Martin Taylor (Association of Medical Research Charities)

Observers: Mike Edbury (BIS); Ron Egginton (BIS); Jessica Ward (BIS)

Secretariat: Dr Aurélie Bovi (Biosciences Knowledge Transfer Network); Dr Tom Jenkins (Biosciences Knowledge Transfer Network); Chris Warkup (Biosciences Knowledge Transfer Network)

Apologies: Prof. Janet Thornton (European Bioinformatics Institute)

1. Welcome and introductions

This was the first Leadership Council Meeting. The Rt Hon David Willets welcomed everyone to the meeting and thanked them for agreeing to join the Synthetic Biology Leadership Council, and to Lionel Clarke for agreeing to co-chair the Leadership Council and providing his business experience to the Council. A round table of introductions then followed to allow Leadership Council members to introduce themselves and the organisations they represent.

A brief overview was then provided to highlight that the Leadership Council has now been established and the publication of the Synthetic Biology Roadmap provides Government with a framework to see where investment is required to support specific actions and activities. There has been a recent commitment of £20m by BBSRC in synthetic biology and a further £50m in extra funding has been allocated to help deliver recommendations highlighted in the roadmap. The Leadership Council can help to make recommendations of how to invest funding and to support the academic and business communities in working together and to encourage the boards of commercial enterprises to co-invest in synthetic biology with Government.

2. Review of Synthetic Biology Roadmap and recommendations – issues arising

Lionel Clarke provided a summary of the Synthetic Biology Roadmap recommendations and the top 3 issues that had been solicited from each of the Leadership council members ahead of the meeting.

In summary:

The UK has a strong academic base in synthetic biology. To translate this into growth, resources will need to be pooled for the UK to be competitive at a global scale. We shall also have to maintain a clear focus, to direct efforts effectively in directions consistent with the Roadmap. We need to build a skilled and expert community. There is a need to establish best practice in responsible innovation in synthetic biology to underpin the ambition which has been driving forward recent initiatives and investments. It is important to reinforce the strong position that the UK has in synthetic biology not only in what it does, but also in terms of how it does it.

Recipients of funding should be aware of their responsibility when developing new technology/innovation. Increased public understanding of synthetic biology and noting potential concerns arising about the technology would be useful to help address these issues and should be considered at future Leadership Council meetings.

Lionel Clarke thanked Leadership Council members for their input into the 'Driving Forward – addressing the issues' agenda item by highlighting their top three issues ahead of the meeting to help structure these discussions. The feedback received has been summarised and clustered around a series of headings to capture the main themes emerging from Leadership Council member input and include:

1. Regulatory, IP
2. Public perceptions, stakeholder engagement
3. Progressing the science / engineering
4. Commercialisation
5. Training

3. Terms of Reference

The Terms of Reference (TOR) were discussed in relation to how the Leadership Council could measure or define success.

Specific activities highlighted for the Leadership Council were discussed and it was considered that an additional activity, to establish and monitor/maintain a leading UK global position in synthetic biology, should be added to this section of the TOR.

The TOR state that Leadership Council meetings will take place three times per year, with one open meeting. Leadership Council members discussed the open meeting and agreed they were very supportive of the spirit of operating in this way. It was highlighted that the FSA operate open meetings and this would represent an opportunity to identify best-practice format for future open meetings.

The TOR were approved in principle by Leadership Council members subject to the additional activity highlighted above being included. The revised TOR will be circulated to Leadership Council members for approval.

4. Update on Research Council and Technology Strategy Board investments and future plans in Synthetic Biology

Amanda Collis and Belinda Clarke provided a joint presentation from Research Councils and Technology Strategy Board (TSB) to update on recent investments since the publication of the Roadmap in June, and also to highlight relevant Synthetic Biology investment since 2006.

The £20m BBSRC investment in six large strategic grants was highlighted with projects focussing on a range of application areas from biofuels and high value chemicals to sustainable agriculture. EPSRC have also invested £5m in infrastructure platform technology through the Flowers consortium, which will help to develop an important new resource between the research-base and industry and includes Imperial College London, Cambridge, Edinburgh, Newcastle and King's College London as partners.

EPSRC will also be launching a call for Centres for Doctoral Training, which will represent a funding partnership with the BBSRC and includes Synthetic Biology as a priority topic. The training should cover industrial, economical and ethical issues associated with Synthetic Biology and industrial internships are encouraged as part of the Doctoral Training experience.

The Synthetic Biology Special Interest Group (SynBio SIG) was highlighted as a jointly funded TSB, BBSRC and EPSRC activity, which is coordinated and managed by the Biosciences KTN. The SynBio SIG was established in May 2012 and brings together a community of more than 500 research-based experts in synthetic biology with industry partners to catalyse the translation of new innovation towards commercial applications to help establish a competitive UK Synthetic Biology industry. Five SPARK awards have also been funded through the SynBio SIG which have successfully created new collaborative partnerships between the UK research-base and SMEs.

The £6.5m TSB-led Feasibility Studies competition in synthetic biology, with co-funding from BBSRC and EPSRC, has recently concluded and has helped to encourage UK businesses to explore industrial applications for Synthetic Biology. Funding will help companies to demonstrate the feasibility of using Synthetic Biology approaches in the creation of new or improved products and processes. Projects will also need to consider responsible innovation and this will be included in the assessment criteria – successful projects will be announced on January 25th 2013.

EPSRC are leading a £10m Innovation and Knowledge Centre (IKC) in Synthetic Biology, in partnership with BBSRC, ESRC and TSB. The IKC will help to accelerate the commercialisation of new technologies developed in the field of Synthetic Biology and will help to create new collaborations between the research-base and industry. The deadline for Expressions of Interest in the IKC is 20th December 2012, invitations to submit full proposals

will be announced on January 18th 2013 and the final submission date for full proposals is anticipated to be towards the end of March 2013.

Future activities and investments include the £50m announcement on December 10th to develop a network of new multi-disciplinary research and training centres as a foundation for commercial success. International activities include the SynBio ERA-Net, which brings together SynBio funders across member states to develop trans-national funding calls and small pilot projects.

The UK also recently led a mission to the US to better understand the activities of funders such as the NSF, who have indicated they are committed to partner with the UK, which will enable UK scientists to collaborate with their US counterparts. Activity to explore UK-China research collaborations is also being taken forward through links with the SIN-FCO in China and is focussing on bottom-up partnerships with the science-base.

Leadership Council members also highlighted that it will be important to include UK industry in international collaborative activities wherever possible, to help ensure that research-based innovation can also be commercialised by UK companies. Public-sector funding can also be used to catalyse private-sector investment by giving confidence that the UK is serious about developing a competitive industry sector. This has been seen recently in the Industrial Biotechnology sector and will be important to maximise the impact of UK investment in Synthetic Biology.

The ongoing activity between the six academies is another example of international collaboration between the UK, US and China. This is something which can also be included in future international activities – the next six academies meeting will take place at Imperial College, London in July 2013.

5. Driving forward – addressing the issues, actions arising

Lionel Clarke introduced the agenda item and thanked Leadership Council members for their input. The issues that have been identified by Council members have been collated and summarised into five theme areas to help structure discussions.

It was recognised that the Leadership Council does not have SME representation, although there was an acknowledged need to keep representation to a manageable size. The TOR highlights that the Council can establish sub-groups as and when necessary, which could include relevant external stakeholders such as SMEs. The Synthetic Biology Special Interest Group also serves as a mechanism to reach all SMEs and key groups that are interested in taking forward recommendations from the Roadmap and priorities identified by the Leadership Council.

Discussions on the main themes are summarised below.

1. Regulatory, IP

   The UK has a recognised strength in plant sciences and understanding how future plant and crop science R&D would fit into this regulatory landscape would also be beneficial to

inform future direction of Synthetic Biology applications in plants. Improving the speed and effectiveness of communication between those involved in leading-edge science and those engaged in ongoing review of regulatory frameworks could be a distinct advantage. New data and understanding arising in this developing field could then be assimilated more rapidly and effectively, to ensure sufficient rigour and caution is applied without introducing unnecessary constraints. Including representatives to help join-up thinking across other committees, such as HSE, could be beneficial in this respect.

Discussions relating to IP were introduced by Lionel Clarke, with reference to a recent letter from Prof. David Castle (Innogen). Leadership Council members agreed it was desirable to maintain an environment where there is access to open source material (e.g. bioparts) and information whilst also enabling commercial areas to be protected to help ensure the industry develops. The next six academies meeting will take place at Imperial College, London on 15th-16th July 2013, and will include representatives from the US and China. It could be possible to include a session on IP management during the six academies meeting to help inform the Leadership Council on strategies to address challenges arising from IP and innovation in Synthetic Biology.

2. Public perceptions, Stakeholder engagement

This activity has already been established through a variety of activities, including the Research Council Public Dialogue on Synthetic Biology. In considering how the Leadership Council ensures this activity continues it is useful to consider two questions:

i. How do we engage the public?

ii. What mechanisms do we use to do this?

Synthetic Biology is maturing as a technology area and market products are starting to emerge. Engagement with the public can therefore now start to be taken forward to help share understanding of how the technology can benefit society. Drawing upon best practice from other activities (e.g. Forum for the Future, which has highlighted public benefits from Industrial Biotechnology) will also be important to help ensure a consistent message and language is used for public engagement.

3. Progressing the Science/Engineering

The presentation and discussions taken forward under agenda item 4 gave a good overview of current activities and investments to progress the science from RCs and TSB. The recent announcement by Government on 10th December to invest £50m in Synthetic Biology is good news, however we will need to ensure the investment is used wisely for the benefit of UK Plc.

The earmarked £50m will require a business case to be developed before the funds can be released and this is currently being taken forward by RCs, with BBSRC leading this activity.

4. Commercialisation

Leadership Council members discussed opportunities to leverage other relevant activities, such as the Industrial Biotechnology Leadership Forum (IBLF), to benefit the emerging Synthetic Biology sector. Lionel Clarke will be involved in the IBLF panel discussions at the 'Leading IB: A UK Showcase event' on 22nd-23rd January 2013.

Leadership Council members agreed that further discussions should be taken forward around commercialisation, relevant activities from the IBLF and industrial translation models at the next meeting.

5. Training

There was a recognised need for specifically trained scientists to support the emerging Synthetic Biology industry and to enable the recommendations and ambitions detailed in the Roadmap to be realised. The Doctoral Training Centres announcement was considered as a positive step towards realising this ambition. Leadership Council members highlighted that there was already training being undertaken in the UK relevant to Synthetic Biology, and consultation with relevant academic groups involved in delivering this training would be beneficial in helping to direct the Doctoral Training Centres, and learning from this experience will help ensure best-practice is followed. Amanda Collis offered to provide Council members with an update on progress with Doctoral Training Centres at the next meeting.

Actions required before the next Leadership Council meeting were agreed.

6. AOB

Due to limited time no further items were discussed under AOB.

7. Dates for 2013 meetings

Leadership Council meetings in 2013 have been organised to enable the Rt Hon David Willetts to join for the first part of the discussions, with future meetings taking place on 14 March, 18 July and 24 October. These meetings will have a morning start (09.30) and Leadership Council members suggested there would be value in extending the duration of future meetings to allow time for greater discussions to address issues, and suggested a meeting close time of 15.00.

8. End of meeting

Lionel Clarke thanked Leadership Council members for their time and contributions today and closed the meeting.

Synthetic Biology Leadership Council – Summary of actions 13th December 2012

Action No.	Activity description	Person
1	Secretariat to work with Richard Kitney and Belinda Clarke to include an additional specific activity in TOR to establish and monitor / maintain a leading UK global position in Synthetic Biology and circulate to Leadership Council members for approval.	SBLC secretariat, Richard Kitney, Belinda Clarke
2	Belinda Clarke to update Leadership Council members on project applications to the current Feasibility Studies competition and to work with Amanda Collis to provide a breakdown of the Universities and research institutes that have been awarded significant funding through the RC investment in Synthetic Biology.	Belinda Clarke, Amanda Collis
3	Joyce Tait to summarise current position in relation to the Cartagena Protocol on Biosafety and circulate to Leadership Council members. *Ron Egginton to take forward discussions with relevant contacts at Defra.*	Joyce Tait, Ron Egginton
4	Leadership Council members to establish a regulatory sub-group and take forward discussions ahead of the next Council meeting in March. Joyce Tait to lead on these activities, with support of interested Council members.	Joyce Tait, supported by interested Leadership Council members
5	Lionel Clarke to take forward further discussions with David Castle and Dick Kitney about potential to include IP session at the next 6 academies meeting at Imperial College.	Lionel Clarke, Dick Kitney
6	Secretariat to work with Lionel Clarke and contact Joanne Hodges at the BIS Science Media Centre to introduce the Leadership Council and to indicate that public engagement has been identified as an important area for future UK Synthetic Biology activities. Leadership Council is kept informed (via Lionel Clarke) of future social engagement activities by the Science Media Centre relevant to Synthetic Biology.	Secretariat, Lionel Clarke
7	Establish a sub-group to provide effective dialogue between the Leadership Council and the Research Councils on the multidisciplinary research centres strategy being led by BBSRC. Council members expressing interest included Amanda Collis; Dick Kitney; Simon Dolan; Sarah O'Connor.	Amanda Collis; Dick Kitney; Simon Dolan; Sarah O'Connor
8	Belinda Clarke to report back outcomes from the Emerging Technologies and Industries meeting on discussions relating to public engagement and communication at the next Leadership Council meeting.	Belinda Clarke
9	To look at areas of excellence and potential leadership activities within the UK based on the emerging technology assessment methodology used at the Institute for Manufacturing and report back to the Council at the next meeting	Belinda Clarke
10	To include an agenda item to discuss Synthetic Biology commercialisation, relevant activities from the IBLF and industrial translation models at the next Leadership Council meeting.	Secretariat
11	Amanda Collis to provide an update on progress with Doctoral training Centres at the next meeting.	Amanda Collis