



## **Synthetic Biology Leadership Council – Meeting 21 (6<sup>th</sup> Open Meeting)**

**Wednesday 21st November 2018**

**Royal Academy of Engineering, Prince Phillip House, 3 Carlton Terrace, London SW1Y 5DG.**

### **Attendees (SBLC members):**

Lord Henley, Prof Lionel Clarke, Prof Richard Kitney, Prof Joyce Tait, Prof Janet Bainbridge, Dr Tim Fell, Dr Lee Beniston (on behalf of Dr Rowan McKibbin), Prof Tim Dafforn, Dr Yvonne Armitage, Prof Petra Oyston, Dr Joe Adams (on behalf of Dr David Tew), Dr Dana Heldt, Paul Henderson, Gillian Whitworth

### **Apologies:**

Dr Louise Ball, Dr David Tew, Dr Amanda Collis, Dr Jo Bray, Prof Dale Sanders, Dr Jason Vincent, Jonathan Hoare

### **1. Welcome**

- Lionel Clarke welcomed SBLC members and attendees of the open meeting. He explained the role of the SBLC as it is unique in the world and involves the government, with Lord Henley attending the meeting.
- The SBLC members introduced themselves.

### **2. Internal Business**

- Alastair Kent has stepped down from SBLC and the Governance subgroup. Lionel has thanked him in a personalised email for all the work and input into the SBLC.
- Apologies from absent SBLC members were noted
- The minutes from SBLC 20 were approved and actions reviewed. All actions have been completed.
- The agenda for the meeting was outlined and the meetings focus on commercialisation emphasised.
- The establishment of a commercialisation 'subgroup' - or other form of extended representation - has been suggested. There has been a significant growth in start-ups and spin out companies working in cross sector areas with various industrial applications. SBLC needs to ensure their views are considered and represented. Challenge is how to coordinate those and collect their views.
- Key points & suggestions for the commercial 'subgroup' activity were noted:
  - Sectoral organisation, eg agriculture, chemicals, pharmaceuticals...
  - Identify stakeholders and customers
  - Consider innovation infrastructure. Differentiate between disruptive and incremental innovation. Clarify how to support & govern the technologies accordingly.
  - Map out future markets and products. Where is the market pull? Identify potential flagships and shared challenges.
  - Compare and learn from other sector business models
  - Make distinction between large company and start-up issues and needs

### 3. Preparation for discussion with Lord Henley

- The key points for the discussion with Lord Henley were identified
- 1. Commercialisation – as discussed above
- 2. Governance subgroup:
  - Joyce Tait gave update and pointed out the importance of regulation. Concern was raised that companies will move away from the UK if regulation is more disproportionate than elsewhere.
  - Joyce Tait and Lionel Clarke had drafted a letter to Lord Henley on the ECJ ruling on the regulatory status of gene edited crop plants. Gene editing is a worldwide regulatory issue not only affecting the UK.
  - A Ministerial Working Group on Future Regulation has been established by the Government. Need to ensure the SBLC & Governance subgroup have an input to this.
  - Need to develop a standard for responsible innovation with industrial focus.
- 3. Science and Technology Subgroup
  - Richard Kitney gave update on the future synthetic biology strategy document. The document, to be published early next year, addresses:
    - 1) people - right education needed and important for the UK to attract high skilled people.
    - 2) business models - distinction between large companies, start-ups, SMEs.
    - 3) finances – public vs private funding. Funding difference need to be made as current strategy is focused on the larger companies
    - 4) Synbio integration – requirement for the government to recognise importance of synbio
    - 5) Industrial Translation
- 4. Importance of Synbio
  - Continued need to ensure Synbio is recognised by government as driving part of the Bioeconomy. It's a cross sector technology, translating into creation of jobs. Need to re-energise synbio and its status, building upon the original Eight Great Technologies vision and policy.

### 4. Discussion with Lord Henley

- Lionel welcomed the minister. He explained there were 3-4 key points the SBLC would like to discuss.
- The minister reflected upon his recent visit to Bristol and the impressive work carried out at [BrisSynbio](#)
- The minister addressed the letter received from Joyce Tait and Lionel Clarke on the EJC ruling on gene editing. Ruling cannot be changed, and he agrees with concerns raised.
- The unsuccessful ISCF wave 3 EOI application was addressed. The minister hoped the feedback was positive and will help further proposal applications.
- Roadmap discussion: The 2012 & 2016 documents captured the moment of time and focused on jobs and innovation. A new Roadmap is being proposed to act as a sector deal to ensure commercialisation. Synbio will play a key role in transforming the bioeconomy and the recognition of synbio as one of the 8 Great Technologies by the government was crucial.
- Richard Kitney explained the Science and Technology Subgroup. Synbio is similar in a number of ways to the IT revolution. He highlighted the differences between small/SME/Start-ups and large companies and the requirement for a separate

funding model for each. He gave SynbioBeta as an example: vibrant conference environment with large and small companies and private investors present.

- Role of the government was emphasised:
  - Government backup, support and leadership is important.
  - Crucial for the government to understand the broad commercialisation landscape and to apply public funding to leverage increasingly substantial private investment (positive influence).
  - Previous recognition of Synbio as one of the 8 Great Technologies was highlighted and the continuing need for the government to help get the message across. Synbio is a disruptive technology advancing the bioeconomy, but requires consistency of support over the longer term to match research, translation and commercialisation timescales.
  - Government needs to help build credibility nationally and internationally and it's important to refresh the long term vision for synbio.
- Current synbio sector is difficult to define with about 100+ companies working cross sector. Need to segment and categorise the areas & clusters. Need to identify what each requires for growth and commercialisation, considering there is no 'one size fits all' approach.
- Need to articulate UK's take on Synbio and decide the areas to promote. It's crucial to make precise decision and identify areas to focus on, enabling growth of UK's bioeconomy.
- Lord Henley recognised the importance of commercialisation and asks for continued discussion to ensure the government is kept up to date and the correct decisions are made.
- Regulation:
  - Joyce Tait gave update to the minister, highlighting the research carried out by Universities. A research program in collaboration with BSI was set up, looking at regulation and responsible research & innovation.
  - The Ministerial Working Group on Future Regulation was discussed. Regulation is a world-wide problem and UK could be a leader in the area with Brexit creating an opportunity. The next meeting will take place January 2019. The Letter on the ECJ gene editing ruling could be addressed in this upcoming meeting.  
**Action 21-1: Lord Henley proposed a meeting on this subject with Joyce and Lionel before Christmas.**
  - Speed of regulatory decisions was discussed with Oxitec's 10 year journey given as example. Considering how we can deal with regulatory approvals more efficiently, the requirement for more relevant standards, sets of rules and the establishment of a new regulatory framework were proposed.
- Entrepreneurial/iGEM:
  - Lionel gave a general update on the iGEM competition, highlighting UK's success: 14 teams from UK have entered with 11 winning gold this year. There is an increased number of entries from China, showing China's progress in synbio. The Oxford Undergraduate iGEM team introduced themselves and gave a short introduction on their project which won the 2018 Best Therapeutic Project award.
  - Lord Henley addressed a number of questions to the team relating to project/ideas development. Lord Henley asked for a Paper on the project. **(Action 21-2)** and note on previous winners **(Action 21-3)**.

- Lionel mentions iGEM wanted to set up an office in Europe which was unsuccessful when assessed last year, but the option should be revisited in the future
- Photo of Lord Henley with the iGEM team was taken.

## 5. Scene setting presentations

- 3 scene setting presentations took place on the topics synbio entrepreneur and Commercialisation, Disruption and the Bioeconomy
  - Oxford Undergraduate iGEM Team
  - EUSynBio - Adam Amara
  - IBioIC – Ian Archer

## 6. Breakout sessions

- The SBLC members agreed to three ‘world cafe’ style breakout sessions, which were discussed in rotations for 30 minutes. The summaries of the sessions are provided below.

- 1) What are the key strengths the UK can offer to - but also gain from - international partners? How to reach out? Where are we heading? Can we envision a radically transformed future 2030+? Tech push vs Market pull? Do we need ‘Moonshots’?
  - Key strengths: UK infrastructure, KTN, SIG, SynbiCITE, SBRCs, good academic base, strong talent pool, cost in UK for doing R&D is relatively low, iGEM success in UK synbio, start-ups out of iGEM, collaborative networks
  - Concerns: European Partners post Brexit? Make sure government does not undermine access to vital international talent (visas)
  - There is demand from international communities and leaders to collaborate with the UK, especially from US and Canada. UK provides multidisciplinary teams, innovative approaches and excellent value for money.
  - Need for more smaller grants allowing PoC funding.
  - Where are we heading: Media plays negative role, Plastic, food waste, beginning to affect other areas for funding, sustainable solutions, Develop synbio commercially is needed, Need to be more relaxed going after money,
  - Remain aligned with government plan
  - Recognise where “fashionable topics” are taking us.
- 2) What skills and systems could be usefully modified to streamline the translation of ideas into valuable commercial options?
  - University outputs need to be more flexible and commercially transferable. Improvement of tech transfer required, considering:
    - Slow turnaround
    - Speed to patents
    - Cost/money
    - Processes unclear to students
    - Splitting of TTO activities into areas eg Licensing, Spin outs
    - Standardised Contracts
    - Commercialisation oriented T & C’s defined in grants
  - Need for cultural change in Universities and integrate business/entrepreneurial aspects. Student acceleration space to support and encourage undergraduates.

University self-select → same providing iGEM teams others are not. Better communication required, eg articles in student union newsletters explaining /highlighting opportunities for students.

- Opportunities after iGEM, company spin outs (example: Customem)
- Skills/Skill gap: mathematics, statistics, computer science, engineers need to be trained in bio. Not enough engineers, why is this? Do they not exist? Integrating biological aspect into the engineering course
- Advice service needed on different subjects: e.g. regulatory, Revisit Synbio SIG as advice body
- Manchester cross translation example (?)

3) What are the main common industrial challenges facing such a diversity of SMEs and start-ups? How to collate and represent a unified view? What would a 'sector deal' look like?

#### SMEs and Markets

- 2 types of SMEs- Incremental, disruptive
- Focus issues: improvement of service/product vs keep doing what company is doing. Tech development vs business development.
- Mentorship from Businesses and better collaboration between companies
- Understanding the emerging market. Start-ups need to identify the primary customer. Are start-up clear what they are doing and why? How to translate solutions to unmet needs

#### Funding

- Access to early scale up challenging
- Private partnership funding needed
- Companies have bright ideas, but are they commercial?
- Niche markets worth £2-3mio, need to map out those markets

#### Universities

- Confusion around university spin outs and the process → Education needed
- American Universities do not take cuts from spin outs.
- Academics have to publish as part of their job, how success is measured → coordinate publication process with IP protection.
- Academics do not the understand the market
- Universities not aware of development costs.

#### Sector deal

- Synbio not a sector but underpinning technology. Is sector deal the right way forward?
- Sector deal will emphasise government support and ensure integrity of synbio community.
- Emphasis the synbio contribution to the 4 grand challenges. What is the value?
- Incorporate synbio in other sector deals, cross sector application
- Leadership needed (larger companies)

## 7. AOB

- A number of upcoming conferences were highlighted
  - UK Synbio conference ([SBUK 2019](#)) on December 9<sup>th</sup>/10<sup>th</sup> in Warwick. Registrations are open

- [SynbiTECH](#), organised by SynBiCITE is taking place 24-25<sup>th</sup> June in London. SynbiTECH 2019 will address how to grow the Bioeconomy by building a global multi-billion dollar synthetic biology industry. The event will provide a forum to drive innovative thinking and international collaboration – to determine how science and engineering – leveraged by industry, finance and policy – can create a sustainable economy through synthetic biology/engineering biology.

## 8. Actions

The actions from SBLC 21 are summarised in the table below

Actions	Description	Responsibility	Due date	Progress /outcome
21 – 1	Meeting between Lord Henley, Joyce Tait and Lionel Clarke on regulatory matters	Joyce Tait, Lionel Clarke, Paul Henderson	By next meeting	Discussion have been taking place.
21 – 2	Provide summary of Oxford iGEM team project for Lord Henley	Dana Heldt	By next meeting	Summary was not made available by iGEM Team
21 – 3	Summary on UKs iGEM success (for Lord Henley)	Dick Kitney	By next meeting	done
21 – 4	Draft 'Commercialising UK SynBio' report	Lionel Clarke, Dana Heldt	By next meeting or sooner as required	in discussion