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Executive Summary

The Synthetic Biology Special Interest Group (SynBio SIG) was a 2-year program (March 2017 - March 2019) funded by Innovate UK and Biotechnology and Biological Sciences Research Council (BBRC), aiming to support commercialisation from synthetic biology through network building and engagement with industry and research base operating in the space.

During the 2 years, the SIG delivered networking events attended by over 100 delegates. The team supported 64 companies, built a network of 875 interested people and made 24 introductions.

The Synbio Landscape map was published, providing an overview of current UK capabilities and activities in the field, listing companies and synthetic biology research centres.

KTN’s Chemistry and Industrial Biotechnology Showcase event which was held in York in September 2017 provided an opportunity for synbio companies to showcase their technologies and products in the engineering biology session.

The Synbio SIG activities will continue under KTN core as business as usual and the team will continue to support researchers and companies to bring their technologies and products to market.
Synthetic Biology SIG

Background

Scope

In 2012, the UK roadmap for synthetic biology was published, highlighting synbio as an emerging and enabling technology, capable of providing solutions for current day problems where traditional technologies have failed. This led to the recognition of synthetic biology as one of the “eight great technologies” in 2013, followed by an investment of more than £300m of public funding into synthetic biology research and capability in the UK. The research councils established six Synthetic Biology Research Centres (SBRCs), five DNA synthesis facilities, two centres for doctoral training and a dedicated Innovation and Knowledge Centre (IKC), ensuring the education and maintenance of a skilled synbio research base.

While funding of the research base provides the UK with the capability to be a global leader in synthetic biology, a lined-up approach involving industry is needed to maximise its full potential and return on investment. In 2016, the ‘Biodesign for the Bioeconomy,’ a strategic plan for UK synthetic biology, authored by the Synthetic Biology Leadership Council (SBLC) was launched to realise synbio opportunities.

The plan points out five recommendations:
- accelerating industrialisation and commercialisation;
- maximising the capability of the innovation pipeline;
- building an expert workforce;
- developing a supportive business environment;
- and building value from national and international partnerships.

KTN is well placed to facilitate the focused industrial engagement needed to translate world-class synthetic biology science into commercial outcomes, which will improve people’s lives and contribute to the growth of the UK economy.

Aims and Objectives

The aims and objectives for the Synbio SIG were divided into three overarching themes:

**Theme 1: Engage and enhance the UK Synthetic Biology community; catalyse new collaborations**

1.1. Interact & connect with Industry, the UK Bioindustry Association Engineering Biology Advisory Committee (BIA EBAC), Networks in Industrial Biotechnology and Bioenergy (NIBBs) & link to research-base

1.2. Interface with Innovation and Knowledge Centre (IKC), Synthetic Biology Research Centres (SBRCs) & other academic centres of excellence; connect to industrial partners

1.3. Interface with the international synthetic biology community

1.4. Maintain SIG content on KTN’s website; signpost relevant funding & events

1.5. With the support private capital to the UK synthetic biology sector; educate investors; highlight investment and partnering opportunities (working with support of KTN’s A2FF team)

**Theme 2: Support UK Research and Innovation (UKRI) activities relevant to the synthetic biology community and help deliver & monitor their impact**

2.1. Promote and support relevant UKRI funding calls and strategies; provide an information portal to synthetic biology community

2.2. Support the development of UKRI strategy formation for synthetic biology

**Theme 3: Support for implementation of the UK Strategy and Policies for Synthetic Biology**

3.1. Secretariat to the Synthetic Biology Leadership Council (SBLC)

3.2. Support stakeholders to implement and deliver the 2016 strategic plan
## Deliverables

The Deliverables for the Synbio SIG were set out as following:

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<tr>
<th>Deliverables</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Workshops</td>
<td>Hold 2-3 technology and/or challenge workshops, providing networking and collaboration opportunities</td>
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<tr>
<td>Landscape Tool</td>
<td>Publication of a UK synthetic biology landscape map. The map will summarise UK capabilities and activities in the field, highlighting companies, research centres of excellence in synthetic biology and networks operating in the synbio area.</td>
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<tr>
<td>Communication</td>
<td>Publication of relevant Synthetic Biology news via the Synbio Twitter account and the LinkedIn group. Distribution of a regular Synbio Newsletter giving an overview of the latest UK developments in synbio, relevant funding opportunities and KTN events.</td>
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<tr>
<td>SBLC</td>
<td>Organise and support the delivery of 3 SBLC meetings per year, of which one is an open meeting. The open meeting can be attended by members from the wider Synthetic Biology community and will provide participants with an opportunity to understand how the SBLC operates, take part in breakout sessions to influence the SBLC and to pose questions to the members. The open meeting also provides a useful networking opportunity with others in the field.</td>
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In 2017 KTN’s Chemistry and Industrial Biotechnology team organised a Showcase event, which featured a synthetic biology session. Companies operating in the space demonstrated how synbio contributes to different aspects of the bioeconomy, from waste management to the textile industry and high-value chemical manufacturing. Further companies showcased their use of synbio to create functional materials with specific properties, innovation in the growing personal care market and opportunities in medicines. The pitch session was won by Colorifix, who has developed a textile dyeing process using a natural biological process to produce, deposit and fix pigments onto a wide variety of fabrics. Their revolutionary technology reduces the environmental impact significantly, avoiding toxic and non-renewable petrochemicals.

One of the workshops delivered focused on the use of ‘Synthetic Biology for Bioprocessing of Next Generation’ Biologics. The event, which was organized in collaboration with KTN’s Health team and in partnership with the Centre of Excellence in Biopharmaceuticals (CoEBP), attracted more than 100 registrations with over 40 attendees from industry. Participants discussed the needs and challenges in the design of next-generation biologics; future expression factories for the production of biologics; and underpinning technologies driving innovative changes.

Further workshops took place with a focus on commercialisation. Over 40 representatives from academia, industry, government and relevant stakeholders discussed synbio success studies, the barriers and need to accelerate the commercialisation process and identified UK’s unique selling point.

The Synbio Landscape map, published in 2017, lists companies and synthetic biology research centres within the UK.
KPIs and Outcomes

- 64 company engagements
- 30 research base engagements
- 24 introductions
- A broad audience was reached using KTN communication tools:
  - 875 people signed up to the Synthetic Biology SIG newsletter, receiving regular updates about synthetic biology relevant news and developments.
  - 156 members in the LinkedIn Group
  - 1454 followers on the SynbioSIG Twitter account.
- Support of the SBLC with six meetings delivered, of which, 2 open meetings were held at the Royal Academy of Engineering.

Learnings and Recommendations

1. Synthetic Biology is still an emerging technology. While there have been commercial success stories, mostly in healthcare & pharmaceutical, many UK start-ups and spin-out companies, especially those operating in the tool development and service providing area, are not yet ready for large scale commercialisation.

2. Dedicated investment is needed for start-up and spin-out companies to support early-stage R&D

3. There is a clear need to understand the market opportunities and market pull, which will enable synbio companies to focus on technology and product development beneficial to society.

4. Continued delivery of networking events are needed to bring end-users (market pull) and synbio technology providers together.

Next Steps

Synthetic biology is a platform technology, being recognised as an important driver of productivity and a key enabler to grow the bioeconomy as outlined in the 2018 published document ‘Growing the Bioeconomy: A National Bioeconomy Strategy to 2030’. To ensure continued support for the Synthetic Biology community the SIG will be incorporated into KTNs business as usual.
plans, with follow on activities such as:

- Supporting companies and research base in the Synbio space to commercialise their technologies and products
- Networking events and workshop showcasing the potential of SynBio
- Providing Information on grants, investment opportunities and upcoming events (Newsletter, articles on KTN webpage, etc)

Resources and Further Reading

1. KTN Synbio webpage ktn-uk.co.uk/interests/synthetic-biology
2. Synbio Landscape Map synbio.ktnlandscapes.com
4. SBLC webpage, ktn-uk.co.uk/programmes/synthetic-biology-leadership-council

Contacts

The Synbio SIG was delivered by:

- Amy Taylor (April 2017 - November 2017)
- Yvonne Armitage (December 2017- February 2018)
- Dana Heldt (March 2018 – March 2019)

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The Knowledge Transfer Network (KTN) helps businesses get the best out of creativity, ideas and the latest discoveries, to strengthen the UK economy and improve people’s lives.

As a network partner of Innovate UK, KTN links new ideas and opportunities with expertise, markets and finance through our network of businesses, universities, funders and investors. From materials to energy and from manufacturing to healthcare, KTN combines in-depth knowledge in all sectors with the ability to cross boundaries.

Connecting with KTN can lead you to potential partners, horizon-expanding events, bespoke support and innovation insights relevant to your needs.