

Case studies

Synthetic Biology in practice

We work collaborating with industry to solve real-world problems, relying on our excellent scientists and ability to work across disciplines, some of which include:



LanzaTech

We are working with LanzaTech to utilise waste GHG from steel-mill off-gas. We are designing different bacterial chassis optimised to use waste gases to produce sustainable biofuels. Our aim is to replace petrochemical derived commodity compounds and help alleviate climate change.

www.lanzatech.com



CHAINbiotech

We are working with CHAIN to develop new Clostridium – based microbial products for high value human gut healthcare products.

The core technical team is embedded within the Synthetic Biology Research Centre at the University of Nottingham.

www.chainbiotech.com



Contact us

For further information about our Synthetic Biology capabilities for industry, and how they could benefit your business, contact:

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Synthetic Biology for industry

Pioneering research partnerships
sbrc-nottingham.ac.uk



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EPSRC

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BBSRC
bioscience for the future

- Cutting-edge facilities
- Internationally recognised research
- Industry partnerships
- Specialists in fermentation of industrial microbes

Pioneering research: Working with us at SBRC Nottingham

Synthetic biology research in Nottingham is led by the Synthetic Biology Research Centre (SBRC). It has a research portfolio of £28 million and is based in the University's £40 million flagship Biomolecular Sciences research facility at the heart of the science and engineering hub on the University Park campus.

The SBRC provides access for researchers from across campuses to cutting-edge facilities and teams dedicated to multidisciplinary, pioneering research. There are strong cross-disciplinary academic links with engineers, mathematicians, computer scientists, chemists and social scientists. This provides a holistic approach to developing sustainable production systems for the Bioeconomy. Importantly, the SBRC includes a broad range of PhD studentships cutting across academic disciplines to train the next generation of synthetic biologists. The SBRC has strong and growing collaborative connections with international research teams and industry partners.

Why work with us?

- Our Synthetic Biology Research Centre has over 120 researchers collaborating across disciplines and with industrial partners
- Metabolic engineering expertise

Our world-leading facilities include:

Dedicated facilities for anaerobes (10 double, anaerobic workstations)

21 fermentation reactors of various volumes principally devoted to C1 gas feedstocks

Two Biolectors

A high throughput £1.1 million Beckman robotics systems for automated assembly, transformation, colony picking, growth and analysis, together with all necessary analytics (LC, LC-MS, GC, GC-MS) and tech support

Our partnerships

We have collaborations with academic groups around the world including leading synbio and industrial biotechnology groups in Brazil, China, India, the USA, New Zealand and across Europe.

To facilitate the efficient transfer of specialist knowledge from academia to industry we have pioneered a model of embedding companies within our lab community. Our work has a definite industrial application focus and for that reason we have strong collaborative links with many companies large and small active in synbio.

Our partners/collaborators include:

Green Biologics Ltd	ATUM
Biopolis	LanzaTech
Calysta	Photanol
Chain Biotech Ltd	ZuvaSyntha
Corbion	Johnson Matthey
Siemens	NIZO

Industry collaboration projects and themes

We are constantly exploring new areas of research interest that build from our core expertise, especially where those areas involve industrial collaboration towards real-world impact. We are currently seeking collaborative industry partners for the following four themes.

Find out more at: www.sbrc-nottingham.ac.uk/industry



Infection control

We are working with healthcare companies to develop alternative therapies to antibiotics for controlling infections by the superbug *Clostridium difficile* (C diff) infections. We are using innovative biological control systems and signalling molecules that modulate bacteria growth as different approaches to promoting a healthy gut flora.



Sustainable chemicals and fuels

We are applying synthetic biology approaches to engineer bacteria such as *Clostridium* and *Cuprividus* to be mini-factories that convert sustainable carbon feedstocks into the chemicals and fuels society and industry need. The ultimate aims are to utilise waste greenhouse gases and second generation sugars as feedstocks to help alleviate climate change and break reliance on petrochemicals for our plastic and fuel needs.



Minimising greenhouse gas emissions

Methane (CH₄) is 23-fold more damaging to the environment than CO₂. Keeping methane out of the atmosphere is a key goal. We are working towards the use of methane as a carbon source for the sustainable production of useful foodstuffs and chemicals.



Innovative cancer therapies

We are exploiting some unique properties of *Clostridium* to develop treatments for otherwise unstoppable tumours. The *Clostridium* kill the tumour cells and by delivering a prodrug that is converted only by the bacteria to an active anticancer compound any remaining residual cancer cells at the tumour site are also killed.