SYNTHETIC BIOLOGY

RESEARCH EXPERTISE FOR COMMERCIAL CHALLENGES

THE UNIVERSITY OF EDINBURGH

EDINBURGH INNOVATIONS
Explore opportunities, build ideas and deliver results with the University of Edinburgh

Synthetic biology uses engineering principles to design, build and test biological systems in order to generate new and useful attributes. The University of Edinburgh leads innovative research to ensure that synthetic biology delivers transformative solutions for affordable and effective healthcare, food security, the production of novel materials and greener sources of energy.

The University is a leader in synthetic and systems biology, and has actively brought together world-class capabilities in biology, chemistry, engineering, medicine, informatics, mathematics, physics and social sciences to address the key challenges in this exciting area of technology. Synthetic biology will continue to be a core area of investment and growth for the future.

We are:

- creating novel tools and technologies to enable synthetic biology applications
- offering consultancy and access to state-of-the-art facilities and services
- implementing gold standards in responsible research and innovation in synthetic biology
- collaborating with industry to implement the transformative power of synthetic biology
- enhancing the growth of existing companies and generating new business opportunities
- delivering advanced cross-disciplinary training in relevant specialities

**GSK PLC**, a global pharmaceutical company, is collaborating with the University of Edinburgh to create a new sustainable manufacturing process by developing novel routes for the biological production of a key antibiotic related molecule. This will produce cleaner and greener routes to antibiotics production for GSK.

**Academic expertise:**
Professors Gary Loake and Dominic Campopiano
How we work

**Design and Build**

The Edinburgh Genome Foundry, a BBSRC-funded national facility that carries out the design and assembly of DNA up to chromosome size.

- Bespoke software for CAD and CAM
- Expertise in automation techniques
- A test bed for prototyping robotic systems

**Test**

A wide variety of technology platforms are available to explore the phenotype of synthetically modified cells:

- Novel mass spectrometry techniques
- Next-generation and long-read gene sequencing
- Opera™ confocal high-content screening imaging
- LEAP™ automated live-cell analysis and processing
- Microfluidics platforms
- Novel microscopy methods including single-cell analysis

**Learn**

We can offer extensive expertise in modelling and in the development of standards.

Core facilities

**Edinburgh Genome Foundry**

A fully automated platform to design and assemble DNA up to chromosome length.

**Phenotyping: Kinetic Parameter Facility**

Specialises in contract work and consultancy for synthetic and systems biology research.

**Edinburgh Genomics**

High-throughput gene sequencing technologies supported by bioinformatics expertise.

**Plant Facilities**

Plant tissue culture, containment and controlled growth environments with extensive greenhouses for plant research.

**Innogen Institute**

Research and consultancy around the ethical, legal and social implications of emerging technologies with a particular interest in synthetic biology.

**Ingenza Ltd**, a leading industrial biotechnology company is working with the University of Edinburgh to develop a CRISPR-Cas9 genome modification system in industrial yeast strains. This will generate yeast lines with enhanced value for a range of industrial applications.

**Academic expertise:** Professor Susan Rosser

**Synpromics Ltd**, a pioneering synthetic biology company, together with researchers from Edinburgh are developing screening technologies using automation and next generation sequencing. This enables Synpromics to rapidly identify optimal synthetic promoters for their customers.

**Academic expertise:** Dr Karim Gharbi
We are Edinburgh Innovations, the innovation management service for the University of Edinburgh.

With partners, we will explore opportunities, build ideas and deliver results for industry and the University of Edinburgh. We do this by promoting the research, technology and facilities at the University and use our expertise to manage and develop industry partnerships.

We are committed to delivering a service that drives benefit for industry and society in line with the strategic goals and ambitions of the University of Edinburgh.