

The Inspiration

Founded in 2015, **CUSBS** is a new society that aims to introduce students to the interdisciplinary field of Synthetic Biology. The European Commission defines Synthetic Biology as "**the engineering of biology**: the synthesis of complex, biologically based (or inspired) systems which display functions that do not exist in nature. In essence, synthetic biology will enable the design of 'biological systems' in a rational and systematic way".

As a field, **it has the potential to tackle global issues** as diverse as disease, climate change and food shortages through drug synthesis, biofuel production and crop engineering.

The Starting Point

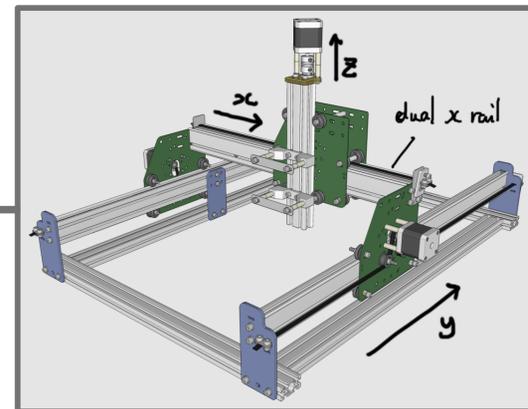
Synthetic biology is perhaps best defined by some of its hallmark characteristics:

- **Predictable**, off-the-shelf parts and devices with standard connections
- **Robust** biological chassis (such as yeast and *E. coli*) that readily accept those parts and devices
- **Standards** for assembling components into increasingly sophisticated and functional systems
- **Open-source** availability and development of parts, devices, and chassis



The Projects

The Society runs **weekly build sessions** to make progress on the long term projects for which we are funded. This year our project is to develop a prototype CNC Microscope (Computer Numerically Controlled), **capable of autonomously imaging a large array of pre-prepared samples**. The CNC frame itself is being constructed from order in the Dyson centre by members of CUSBS.



"Our hope is to have a working prototype being used in a Cambridge biosciences laboratory by the end of this summer, helping to increase throughput significantly"



The finished prototype will first take a large macro image of the sample, then use our **open-source software** to locate areas of interest (e.g. the edges of a bacterial colony) and then move in to take microscopic images using an attached microscope.

Once the entire sample has been imaged, the constituent photos would be stitched together in an **interactive google maps style interface**.

The Community

In continuation of the work by the 2015 Cambridge-JIC iGEM team the Society plans on holding outreach events in local schools, with workshops on Arduino programming and circuit design, and introductions to microscopy.

Members of the Society have gained significant experience in these areas, and such events are of benefit and enjoyment to both the members and the students. Workshop diversification will increase to match the skills and interests of the Society.



The Future

CUSBS has been part of the community of Synthetic Biology groups involved in the planning and creation of a bio-hack space (Biomakespace) here in Cambridge. This will provide open facilities for biological lab projects.

We plan on running introduction sessions throughout Michaelmas to establish wet-lab projects operating in the space. The projects aim will be to establish familiarity with the basics of practical synthetic biology, and allow those without other opportunity to experience working in a wet-lab.



SynBio Fund

With thanks to: The SynBio SRI, CUED, Dr Richard Bowman, SPIP

Atti English, Michael Casey, Olivia Lala, Tristan Orchard, Simon Swan, Ben Kitching-Morley

Email
synbiosoc@cusu.cam.ac.uk

Facebook
www.facebook.com/cusbs/

Website
cusbs.soc.srcl.net/