

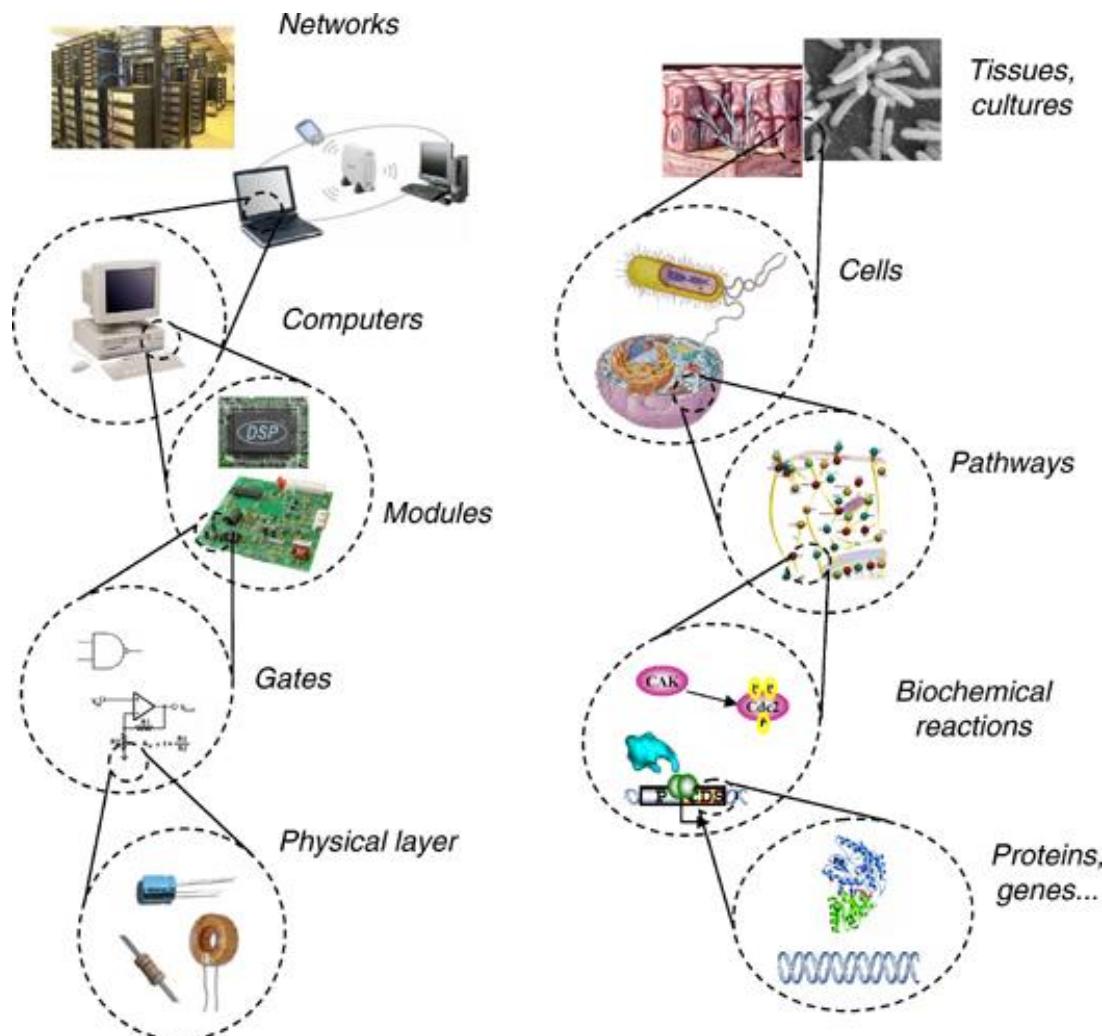
Synthetic Biology



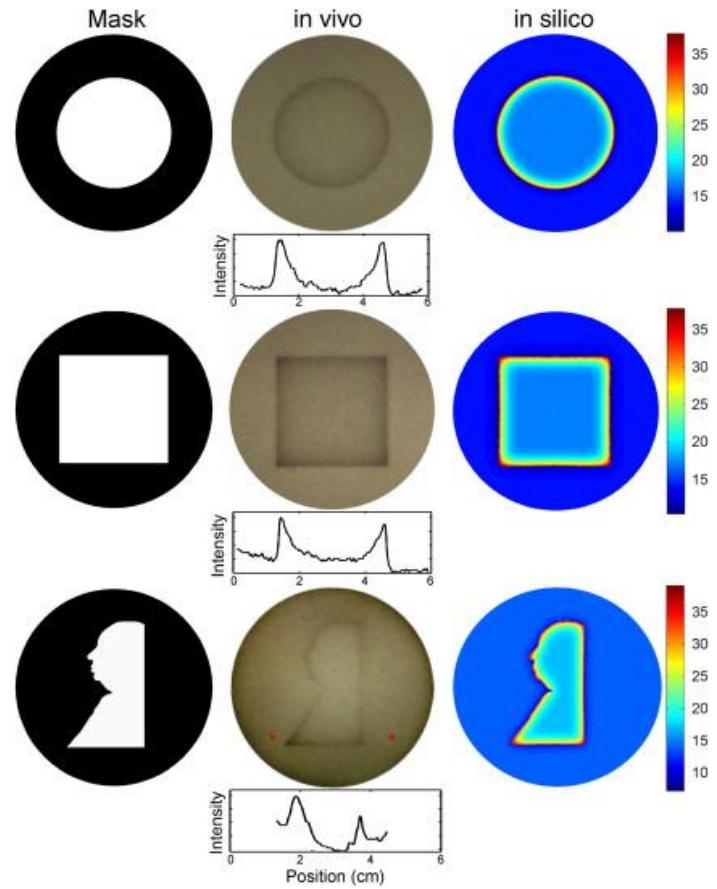
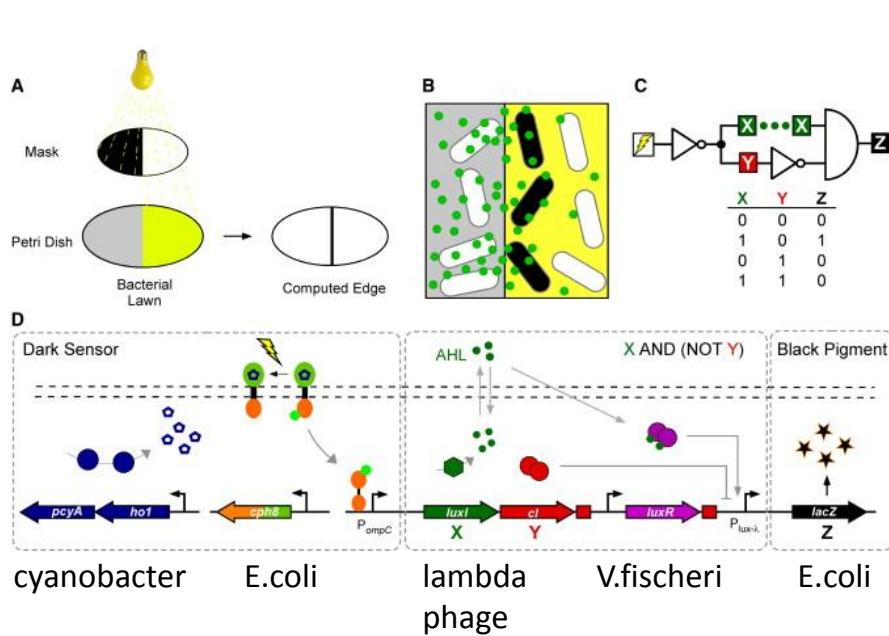
Synthetic biology is the **engineering** of biology: the synthesis of complex, biologically based (or inspired) systems which display functions that do not exist in nature.

Source: High-level Expert Group European Commission

Engineering Biology

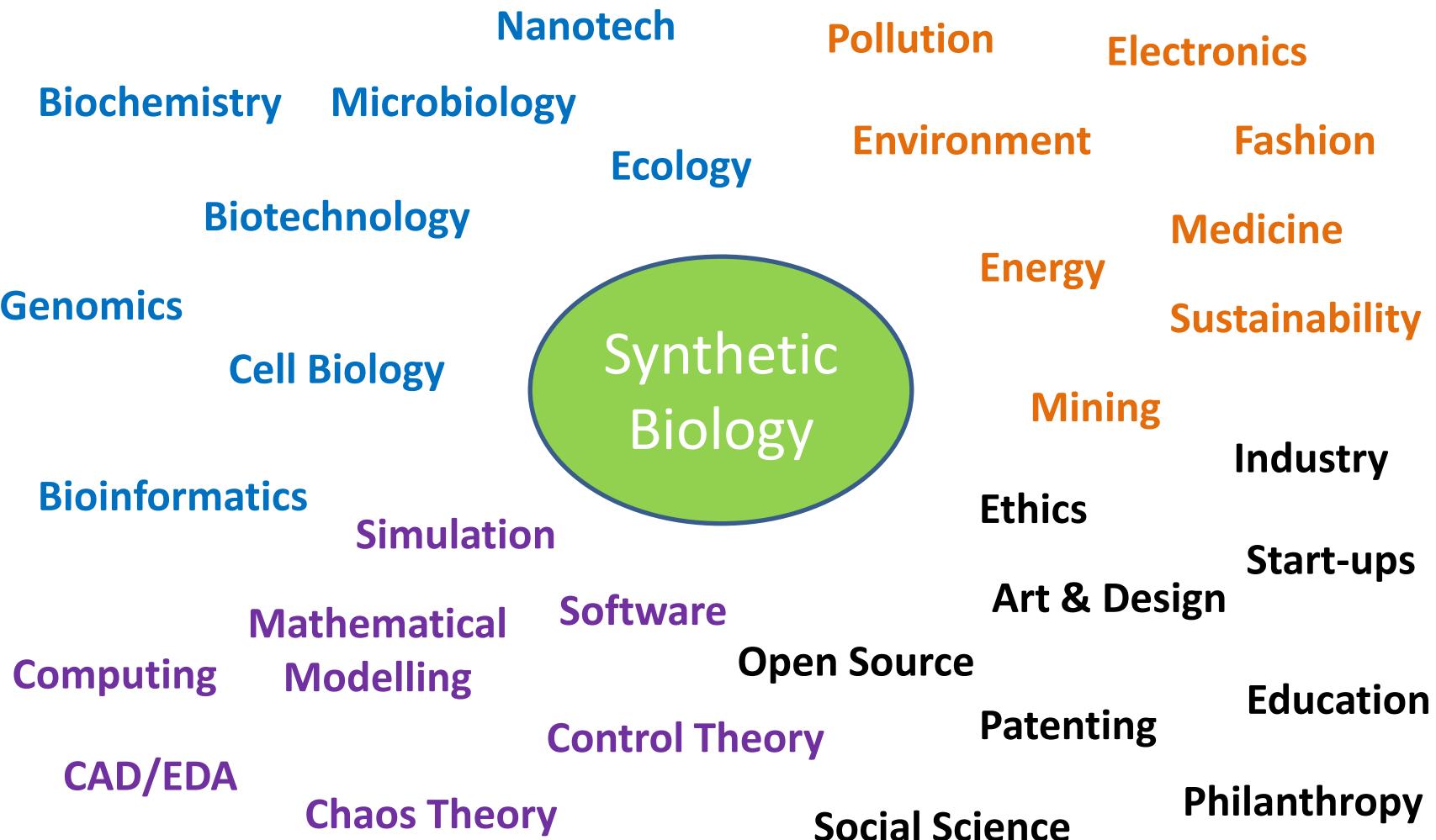


Rewriting biology to give new function



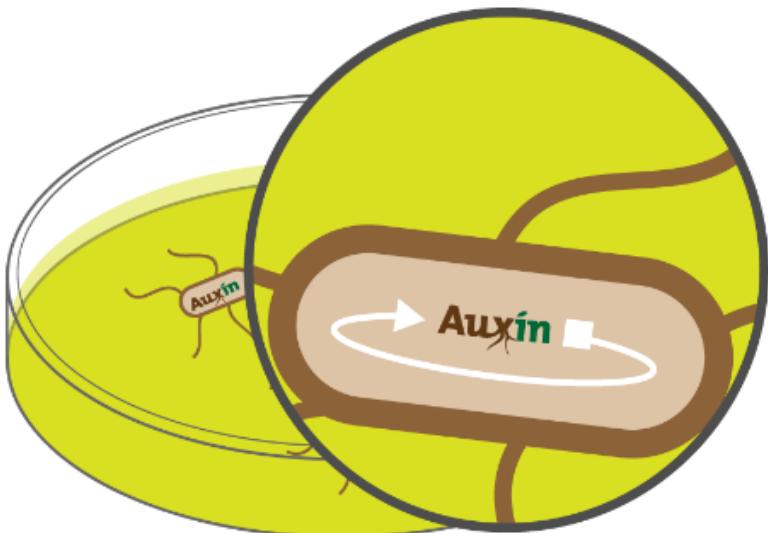
Following an abstraction similar to electronic engineering

Bringing together disciplines



If you cannot view the photo gallery below, please click [here](#) to view our alternative home page or download the Adobe Flash Player [here](#).

PHOTO GALLERY



Project Auxln aims to help fight desertification by promoting plant root growth using engineered bacteria. Re-vegetation is one of the most effective ways to prevent soil erosion. The project consists of three modules – Phyto-Route, Auxin Xpress, and Gene Guard. (Click to learn more)

AT A GLANCE

MAIN RESULTS

DATA

Follow us on



 The Radio_iGEM Show 

 The Radio_iGEM Show

Jamboree Part 3 - The Results

 INFO  FANS  TRACKS  CHAT  EPISODES

What could synthetic biology give us?

The diagram illustrates the E. chromi synthetic biology system for disease monitoring, divided into four main steps:

- 1. Drink:** Drink a bottle of E. chromi Scatalog probiotic once weekly. Anhydrobiotic granules contain synthetic bacteria.
- 2. Colonise:** The gut is colonised by E. chromi bacteria that secrete colours in presence of chemical signals.
- 3. Monitor:** If change is detected, bacteria produce a colour signal visible in faeces.
- 4. Personalise:** Genetic susceptibility can be managed easily.

A Venn diagram on the right shows the overlap of various diseases: Colitis, Rotavirus, Colorectal Cancer, Worms, Salmonella, and Stomach Ulcer. The intersection of all these diseases is labeled "OK!".

E. chromi
Cheap, Personalised Disease Monitoring using synthetic bacterial technology

Scatalog

1. Drink
2. Colonise
3. Monitor
4. Personalise

Colitis, Rotavirus, Colorectal Cancer, Worms, Salmonella, Stomach Ulcer, OK!

E. chromi

Cheap, Personalised Disease Monitoring using synthetic bacterial technology

With James King and Daisy Ginsberg

Course Structure

Lectures:

- Introductory Biology for Bioengineers OR Introductory Engineering for Life Scientists
- Foundations of synthetic biology
- Applications of synthetic biology

Workshop:

- Ethics of synthetic biology 25/1

Classes and Coursework:

- Computer modelling project and write-up Deadline 21/1 (BE) 30/1 (LS)
- Wet-lab practical and data-analysis with questions Deadline 4/2

Mini-iGEM Project:

- Mixed groups coming up with synthetic biology project idea
- Assessed group write-up of idea, inc. modelling, ethics and more... 14/2
- Assessed presentation of project 15/2

Exams:

- Separate exams for Bioengineering and Life Science students

Suggested Reading

Synthetic Biology: A Primer Textbook

<http://www.amazon.co.uk/Synthetic-Biology-Paul-S-Freemont/dp/1848168632>

The iGEM competition

http://igem.org/Main_Page



The BioBricks Parts Registry

http://partsregistry.org/Main_Page



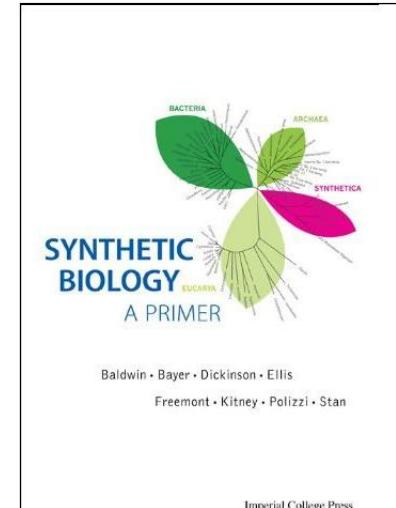
The Woodrow Wilson Project: synthetic biology 101

<http://www.synbioproject.org/topics/synbio101/>

*Synthetic
BIOLOGY*
PROJECT



Woodrow Wilson
International
Center
for Scholars



David Shukman visits Imperial's Synthetic Biology Centre

<http://www.bbc.co.uk/news/science-environment-17511081>



Horizon 1 hour special on Synthetic Biology with Adam Rutherford

<http://www.bbc.co.uk/programmes/b01b45zh>

