



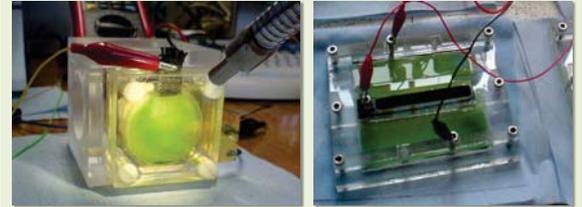
Unlocking the potential of algae

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How we are using algae:

The Algal Biotechnology Consortium at the University of Cambridge takes a multidisciplinary approach to exploit algae for commercial purposes by:

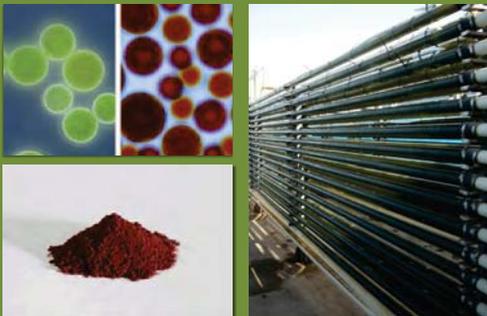
- Developing ways to use algae as **biotechnology platforms** to produce high-value products for the food and pharmaceutical industries, or low-value/high volume compounds such as fuels
- Harnessing algal photosynthesis in **biophotovoltaic devices** that might provide off-grid power
- Growing algae on waste streams such as flue gas for CO₂ capture or waste remediation, **reducing environmental impact** whilst generating products such as animal feed



Algal photosynthesis in biophotovoltaic devices



Algae grown on waste water



Antioxidant astaxanthin from *Haematococcus*

What are algae?

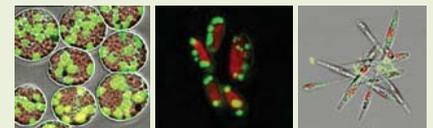
Algae are simple aquatic organisms that live by photosynthesis, and are responsible for around half of the carbon dioxide fixed globally. They are amazingly diverse, ranging from tiny single-celled organisms such as *Prochlorococcus*, less than a micrometre in diameter, to complex multicellular seaweeds over 60m in length.

Currently they are grown to produce compounds that are important in the pharmaceutical, nutraceutical and food industries – ranging from antioxidants to the blue pigment used for Smarties.

What approaches are we taking?

Our interdisciplinary consortium follows a range of approaches:

- **Synthetic biology** – making new combinations of genes and control switches to introduce novel biochemical features in algae
- **Life-cycle assessment** – to quantify the environmental impacts of new algal-based technologies
- **Microfabrication and nanotechnology** – making ultra-small-scale devices to screen and test new algal strains
- **Scale-up** – the Algal Innovation Centre will provide pilot facilities to translate science to industry
- **Public engagement** – our outreach ranges from schools to ‘Pint of Science’ in pubs to BBC R4’s Today Programme



Algae for Synthetic Biology



New Algal Innovation Centre (Picture Dr Matthew Davey)