Complexity and Systems
Biology of Microbial Biofuels
20-24 June 2011
(All talks in MS.03)

Programme

Monday 20th June

12:00-13:15
Arrival and lunch with tea and coffee

13:15-13:30  Nigel Burroughs (Warwick)  Scope and issues

Theme: Biofuel systems and issues
(Chair: Nigel Burroughs)

13:30-14:30  Percival Zhang (Virginia)  Replacing crude oil with sugar (before we run out of oil)
14:30-15:30  Martin Hagemann (Rostock)  Metabolic and transcriptomic phenotyping of inorganic carbon acclimation among cyanobacteria
15:30-16:00  Tea in the Mathematics Institute Common Room
16:00-17:00  Olaf Kruse (Bielefeld)  Biofuels from algae - challenges for industrial levels of productivity
17:00-18:30  Discussion over wine and olives
18:30  Dinner in local restaurant: The Emperors (Chinese), transport from Radcliffe House 18:30

Tuesday 21st June

Theme: Cyanobacteria as biofuel factories
(Chair: Olaf Kruse)

9:00-10:00  Donald A Bryant (Penn State)  Synechococcus sp. PCC 7002: a robust, versatile, and cosmopolitan cyanobacterial platform for biofuels production
10:00-11:00  Ralf Steuer (Manchester)  Systems Biology of Cyanobacterial Biofuel Production
11:00-11:30  Coffee in the Mathematics Institute Common Room
11:30-12:00  Sam Bryan (QM/Imperial)  Spatial localisation of the hydrogenase in synechocystis sp. PCC6803.
12:00-12:30  Conrad Mullineaux (QM, London)  Colocalisation of electron transport complexes in bioenergetic membranes - does distribution at the 100 nm length scale control the partitioning of reducing power?
12:30-13:30  Lunch with tea and coffee in the Mathematics Institute Common Room
Theme: Physiological issues and a systems viewpoint
(Chair: Conrad Mullineaux)
13:30-14:30  Wim Vermaas (Arizona)  Solar-Powered Production of Biofuels by Cyanobacteria: Stoichiometry of Reducing Equivalents and Chemical Energy, and Energy Conversion Efficiency
14:30-15:30  Norio Murata (Okazaki)  Stress sensitivity of photosynthesis and gene-engineered improvement of stress tolerance in cyanobacteria
15:30-16:00  Tea in the Mathematics Institute Common Room

Theme: Ideas in rate optimisation
16:00-16:30  John Golbeck (Penn)  A Hybrid Biological/Organic Photochemical Half-Cell for Generating Dihydrogen
16:30-17:00  Paul Dalby (UCL)  De novo pathway design and evolution
17:00-18:30  Discussion over wine and olives
18:30  Dinner at Kayal (Southern Indian), transport from Radcliffe House 18:30

Wednesday 22nd June

Theme: Metabolic and synthetic engineering
(Chair: Don Bryant)
09:00-10:00  Michelle Chang (Berkeley)  Building new chemical function in E. coli
10:00-11:00  Patrik Jones (Turku)  Engineering model systems for biofuel production and related fundamental studies in prokaryotes
11:00-11:30  Coffee in the Mathematics Institute Common Room
11:30-12:30  Alexander Steinbüchel (Münster)  Plasmid addiction systems designed to allow stable production of products during microbial fermentations

Theme: Physiological issues and a systems viewpoint II
(Chair: Sam Bryan)
12:30-13:00  Nigel Burroughs (Warwick)  Systems Biology modelling: from omics to regulons
13:00-14:00  Lunch with tea and coffee in the Mathematics Institute Common Room
14:00-15:00  Christoph Benning (Michigan)  Regulation of Triacylglycerol Synthesis and Turnover in Microalgae
15:00-16:00  Oliver Ebenhoeh (Aberdeen)  Mathematical models of metabolism and photosynthetic acclimation of Chlamydomonas
16:00-16:30  Tea in the Mathematics Institute Common Room
16:30-18:00  Free time/discussions
18:00-22:00  Conference Dinner at Coombe Abbey (est £10 pp). Transport from Radcliffe House 18:00 - http://www.coombeabbey.com/
Thursday 23rd June

**Theme: New and promising organisms/directions**

*(Chair: Ralf Steuer)*

9:00-10:00 Ed van Niel (Lund)  
The extreme thermophilic *Caldicellulosiruptor saccharolyticus*:  
a promising hydrogen cell factory

10:00-10:30 António Roldão (Chalmers)  
Bringing biofuels closer to reality: engineering yeast cell  
factories for the production of bio-butanol and next  
generation of bio-diesel

10:30-11:00  
Coffee in the Mathematics Institute Common Room

**Theme: Systems biology II**

11:00-12:00 Radhakrishnan Mahadevan (Toronto)  
*Model-based Analysis and Design of Metabolism for*  
*Biofuels and Biochemicals*

12:00-13:00 Arvind Chali (Virginia)  
*Functional integration of transcriptome data reveals broad*  
evolutionary conservation in metabolic subsystems of  
*Chlamydomonas reinhardtii*

13:00-13:45  
Lunch with tea and coffee in the Mathematics Institute  
Common Room

*(Chair: Christoph Benning)*

13:45-14:45 Stéphane Lemaire (CNRS Paris)  
*Redox based post-translational modifications: a central role in*  
*the regulation of cell metabolism*

14:45-15:15 Neil D. Clarke (Singapore)  
*Transcriptome and lipidome analysis in model and non-model*  
algae

15:15-15:30  
Tea in the Mathematics Institute Common Room

15:30  
Trip and dinner in the Cotswolds. Transport from Mathematics  
Institute 15:35 and Radcliffe House 15:40. Return 10pm

Friday 24th June

**Theme: Bioreactors and sustainability**

*(Chair: Martin Hagemann)*

9:00-10:00 Clemens Posten (Karlsruhe)  
*Process development for hydrogen production with*  
*Chlamydomonas reinhardtii*

10:00-10:30 Klaus Hellgardt (Imperial)  
Multiple energy vectors from algae processing

10:30-11:00  
Coffee in the Mathematics Institute Common Room

11:00-12:00 Alison Smith (Cambridge)  
*Sustainable biodiesel production from algae - from life-cycle*  
*assessment to life cycle biology*

12:00-13:00 Chris Herring (Mascoma)  
*The role of OMICs in the development of*  
*Thermoanaerobacterium saccharolyticum for production of*  
*ethanol from pretreated hardwood*

13:00-14:00  
Lunch with tea and coffee in the Mathematics Institute  
Discussions possible all afternoon

**Departure**

Further information can be obtained from the website  
http://www2.warwick.ac.uk/fac/sci/systemsbiology/staff/burroughs/biofuels/