



Workshop on Biological Capture & Utilization of CO₂



September 1-2, 2009
The Charles F. Knight Center
Washington University
St. Louis, MO



Day 1: September 1, 2009

8:00 – 8:30 **CONTINENTAL BREAKFAST**

8:30 – 9:00 Welcome and Introduction

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| 8:30 | Welcome | Mark Wrighton, <i>WUSTL</i> |
| 8:40 | GCEP Introduction and Overview | Sally Benson, <i>GCEP, Stanford University</i> |
| 8:50 | I-CARES Introduction and Overview | Himadri Pakrasi, <i>I-CARES, WUSTL</i> |

9:00 – 11:30 Plenary Session

Chair: Sally Benson

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| 9:00 | Biological Carbon Sequestration by Terrestrial Plants | Don Ort, <i>U of Illinois, Urbana-Champaign</i> |
| 9:45 | Limits to Algal Growth Rate and Their Alleviation | John Raven, <i>University of Dundee, UK</i> |
| 10:30 - 10:45 | BREAK | |
| 10:45 | Challenges Facing the Use of Coal in a Carbon Constrained World: What the Biologists Should be Thinking About | Adel Sarofim, <i>University of Utah</i> |

11:30 – 12:30 LUNCH

12:30 – 2:45 CO₂ Capture by Algae

Chair: Tuan-hua Ho

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| 12:30 | The Role of Inorganic Carbon Transport and Accumulation in the CO ₂ -Concentrating Mechanism and CO ₂ Assimilation in Microalgae | Martin Spalding, <i>Iowa State University</i> |
| 1:00 | CO ₂ Sequestration and Algal Bioenergy: What We Need is More Biology and Less Hype | Alison Smith, <i>University of Cambridge, UK</i> |
| 1:30-1:45 | BREAK | |
| 1:45 | CO ₂ Fixation and Carbon Storage in Cyanobacteria | Lou Sherman, <i>Purdue University</i> |
| 2:15 | Alternative Pathways for CO ₂ Assimilation in Photosynthetic Microorganisms | Bob Blankenship, <i>Washington University in St. Louis</i> |
| 2:45 – 3:15 | BREAK & PICTURE TAKING | |

3:15 – 5:00 Productivity and Utilization of Algae

Chair: Jennifer Milne

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| 3:15 | Industrial Feasibility Studies of Microalgal Biofuel Systems and Their Targeted Improvement | Ben Hankamer, <i>The University of Queensland, Australia</i> |
| 3:45 | Critical Roles of Iron and Other Metals in Algal Productivity | Nir Keren, <i>Hebrew University, Israel</i> |
| 4:15 | Biomass and Bioproducts from <i>Nannochloropsis</i> sp. | Pete Lammers, <i>New Mexico State University</i> |
| 4:45 – 5:00 | CLOSING | Himadri Pakrasi, <i>I-CARES, WUSTL</i> |

6:15 Bus Departs Knight Center for Dinner at Chase Park Plaza, 6:30-9:00



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Day 2: September 2, 2009

7:30 – 8:00

CONTINENTAL BREAKFAST

8:00 – 10:00

Productivity and Utilization of Algae (contd.)

Chair: Ralph Quatrano

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| 8:00 | CO ₂ Capture and Biofuel Production by Microalgae | Yusuf Chisti, <i>Massey University, New Zealand</i> |
| 8:30 | Algal Biohydrogen: Opportunities and Challenges in H ₂ Photoproduction | Maria Ghirardi, <i>National Renewable Energy Laboratory</i> |
| 9:00 | Microalgae as a Platform for the Production of Biofuels and Bio-Product | Steve Mayfield, <i>The Scripps Research Institute</i> |
| 9:30 | Microalgal Biofuels; A Systems Approach | Richard Sayre, <i>Donald Danforth Plant Science Center</i> |

10:00 – 10:30

BREAK

10:30– 12:30

Coupling Emissions from Power Plants to Biological Capture and Fuel Production

Chair: Pratim Biswas

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| 10:30 | CO ₂ Capture by Algae in Fluctuating Irradiance | Ladislav (Lada) Nedbal, <i>Institute of Systems Biology and Ecology, Academy of Sciences for the Czech Republic</i> |
| 11:00 | Molecular Engineering of Microalgae for Biomass and Bioenergy Production | Olaf Kruse, <i>University of Bielefeld Center for Biotechnology, Germany</i> |
| 11:30 | The maximal photosynthetic yield of microalgae in photobioreactors and the minimal requirement for gas transfer | Marcel Janssen, <i>Wageningen University, Netherlands</i> |
| 12:00 | Challenges and Opportunities for Biological Sequestration of CO ₂ from Power Plant Flue Gases | Richard Axelbaum, <i>Washington University in St. Louis</i> |

12:30 – 1:30

LUNCH

1:30 – 4:30

Roundtable Discussion

Chair: Himadri Pakrasi

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| 4:30 | Depart |
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