THE ROLE OF SYNTHETIC BIOLOGY IN ATMOSPHERIC GREENHOUSE GAS REDUCTION: PROSPECTS AND CHALLENGES

Tuesday, Dec 3rd 2019
8:35 AM Welcome and Introductions Charles DeLisi
8:40 AM Welcome, Dean of Engineering Kenneth Lutchen

Session 1 Synthetic and Systems Biology Chair: Ahmad Khalil
9:10 - 9:40 AM Building Self-fertilizing Plants Chris Voigt
9:40 - 10:10 AM Harnessing Arctic & Pelagic Photosynthesis George Church
10:10 - 10:40 AM Building Microbial Chemical Factories Kristala Jones Prather
10:40 - 11:00 AM Break
11:00 - 11:30 AM Engineering nature and society: Art and synthetic biology for a changing climate Christina Agapakis
11:30 - 12:00 PM Towards a framework for Identification and manipulation of key bio-environmental processes to engineer outcomes Adam Arkin
12:30 - 1:30 PM Lunch ELSI Discussion with Robert Cook-Deegan
1:30 - 2:00 PM Synthetic Biology Approaches to Methane Mitigation Mary Lidstrom
2:00 - 2:30 PM Conversion of E. coli to Generate all Biomass Carbon from CO₂ Ron Milo
2:30 - 3:00 PM Photosynthetic Desalination: Green Plants that Purify Salt Water and Secrete Fresh Water June Medford
3:00 - 3:30 PM Harnessing Plant Genomics for CO₂ Capture and Storage in Soils Stan Wullschleger
3:30 - 4:30 PM Open Discussion Moderator: Elizabeth Strychalski

Session 2 Terrestrial - Atmosphere- Ocean System Chair: Mike MacCracken
4:30 - 5:00 PM Terrestrial Systems and the Potential Role of SSB at the Ecosystem Scale Steven Hamburg
5:00 - 5:30 PM Agroecosystem Controls and Synthetic Biology Interventions to Increase CO₂ Drawdown Keith Paustian
5:30 - 6:00 PM Open Discussion and Wrap-up Charles DeLisi
Wednesday, Dec 4th 2019

Session 2 Terrestrial - Atmosphere - Ocean System  
Chair: Mike MacCracken

8:30 - 9:00 AM  Global Change and its Effects on Carbon and Nutrient Cycles in Land Ecosystems  
Jerry Melillo

9:00 - 9:30 AM  Carbon Dioxide Trends and Climate System Responses: The Importance of the Long-term  
Susan Solomon

Session 3 Policy Panel  
Chair: John Reilly

9:30 - 9:45 AM  Opening Remarks and Framing  
John Reilly

9:45 - 10:15 AM  The Current Emissions Pathway and the Expectation of Conventional Climate Policies  
Henry Jacoby

10:15 - 10:30 AM  Break

10:30 - 11:00 AM  Potential and Constraints of Natural Climate Solutions  
Dominic Woolf

11:00 - 11:30 AM  Some Reflections on Opportunities and Risks  
Michael Griffin

11:30 - 12:00 PM  Considerations for Research Governance  
Peter Frumhoff

12:00 - 1:00 PM  Open Discussion & Lunch  
Moderator: John Reilly

Session 4 Ethical Legal and Social Issues  
Moderator: Sir Richard Roberts

1:00 - 3:00 PM  Panel Discussion  
Pilar Ossorio, George Annas  
David Resnik and Todd Kuiken

The Risks and unintended consequences of genomic mediated CDR. Does a biotechnological approach to CDR face challenges that other CDR strategies do not? What are the governance issues? What are the potential solutions?

Climate change and social justice. The severity of the impact is greatest on those at the lowest rung of the economic ladder. Have proposals been made to rectify this? How viable are they? What else can be done?

3:00 - 4:00 PM  Open Discussion & Wrap-Up  
Moderator: Ari Patrinos