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Leveraging photosynthesis via synthetic biology to address climate change and create a circular CO_2-based economy with the production of cost leadership sustainable chemicals and fuels

This presentation will provide an overview of how Phytonix is employing synthetic biology to address the global challenges of climate change and the production of cost competitive, sustainable chemicals and fuels. Phytonix and its organism development partners are using synthetic biology, genomics and metabolomics to develop efficient photosynthetic microbial cell factories for the direct and sustainable production of n-butanol, a valuable industrial chemical intermediate and potential "drop-in" gasoline replacement fuel, as well as other higher alcohols, from solar energy, utilizing carbon dioxide as the sole, direct feedstock with oxygen as the co-product. This is a significantly carbon-negative and sustainable process. The provision of an affordable, available and sustainable carbon source has been one of the greatest barriers to the production of economically viable renewable chemicals. Phytonix's industrial chemical production plants, integrating its microbial cell factories along with cutting-edge process technologies, will be colocated on site at industrial facilities emitting large amounts of carbon dioxide. These include manufacturing plants, chemical plants, natural gas compression stations, coal-fired or gas-fired thermal power plants, steel mills, cement plants and even breweries. Economic and environmental opportunities and advances in industrial biotechnology with a global focus on de-carbonization are leading to a rapid transition towards a new bio-economy and ultimately to a CO2-based economy for the production of consumer products. An overview of Phytonix's current strategic partnership initiatives for scaling up to pilot production and full commercial deployment in the U.S.A. and Europe will also be discussed.

Biography

Bruce Dannenberg holds a Master of Science degree in Industrial Management from Clemson University, a Master of Business Administration degree from the University of Vermont, and a Bachelor's degree in Zoology from the University of Vermont. He has also attended executive management programs at the M.I.T. Sloan School of Management and the Amos Tuck School of Business at Dartmouth College. He is active in the Biotechnology Industry Organization (BIO), where he is a member of BIO's Synthetic Biology Working Group, BIO's Biobased Products and Renewable Specialty Chemicals Working Group, and The EuropaBio Synthetic Biology Task Force. He is a "Synthetic Biology Expert" for the Convention on Biological Diversity (SCBD) and the United Nations Environment Programme (UNEP).

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