

Utilizing Synthetic Biology to Address Global Challenges: Climate Change and Sustainable Chemistry

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 – from solar energy, utilizing carbon dioxide as the sole, direct feedstock.

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 photobiological/photosynthetic process uses carbon dioxide as the sole feedstock and along with solar energy and water produces the desired chemical with oxygen as the co-product. This is a significantly carbon-negative and sustainable process.

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’s breakthrough technology for the production of customized cyanobacterial microbial chemical factories for applications across a broad range of climates will be discussed, as well as its collaborative, “capital-light” business model and the economic and environmental opportunities that new advances in industrial biotechnology, enabled by synthetic biology, provide in terms of a rapid transition to a new bio-economy and ultimately to a CO₂-based economy for the production of consumer products, chemicals and fuels.