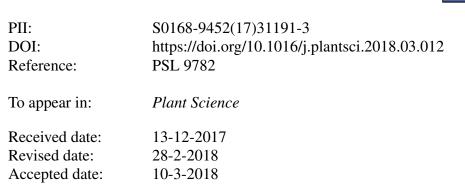
Accepted Manuscript

Title: Towards a sustainable bio-based economy: Redirecting primary metabolism to new products with plant synthetic biology

Author: Patrick M. Shih



Please cite this article as: Patrick M.Shih, Towards a sustainable bio-based economy: Redirecting primary metabolism to new products with plant synthetic biology, Plant Science https://doi.org/10.1016/j.plantsci.2018.03.012

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



ACCEPTED MANUSCRIPT

Title Page

Title: Towards a sustainable bio-based economy: Redirecting primary metabolism to new products with plant synthetic biology

Author: Patrick M. Shih^{a,b,c*}

Affiliations:

^a Joint BioEnergy Institute, 5885 Hollis St, Emeryville, CA 94608, USA.
^b Environmental Genomics and Systems Biology Division, Lawrence Berkeley National Laboratory, One Cyclotron Rd, Berkeley, CA 94720, USA.
^c Department of Chemical Engineering, Stanford University, Stanford, CA 94305.

To whom correspondence should be addressed, E-mail: pmshih@lbl.gov

*Corresponding author:

Patrick M. Shih Joint BioEnergy Institute 5885 Hollis St Emeryville, CA 94608 pmshih@lbl.gov

Highlights:

- Plants are the feedstock and primary input into any bio-based economy
- Increasing feedstock value will make bioproducts competitive with petrochemicals
- Basic knowledge of plant metabolism is essential to engineering efforts

Abstract:

Humans have domesticated many plant species as indispensable sources of food, materials, and medicines. The dawning era of synthetic biology represents a means to further refine, redesign, and engineer crops to meet various societal and industrial needs. Current and future endeavors will utilize plants as the foundation of a bio-based economy through the photosynthetic production of carbohydrate feedstocks for the microbial fermentation of biofuels and bioproducts, with the end goal of decreasing our dependence on petrochemicals. As our technological capabilities improve, metabolic engineering efforts may expand the utility of plants beyond sugar feedstocks through the direct production of target compounds, including pharmaceuticals, renewable fuels, and commodity chemicals. However, relatively little work has been done to fully realize the potential in redirecting central carbon metabolism in plants for the engineering of novel bioproducts. Although our ability to rationally engineer and manipulate plant metabolism

Download English Version:

https://daneshyari.com/en/article/8356354

Download Persian Version:

https://daneshyari.com/article/8356354

Daneshyari.com