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Expediting the biofuels and bioproducts agenda: A petro-industry model

Food and feed crops such as cane sugar and corn seed starch are still heavily used to commercially produce ethanol. The goal of the biofuels industry is to produce biofuels from crop waste matter, that are non-food residues whose cellulosic matter are converted into hydrocarbon liquid fuels (Biofuels) after pretreatment and enzymatic hydrolysis of cellulose via the use of microbial cellulases for production of fermentable sugars, followed by fermentation of sugars into alcohol fuels. Despite the recent improvements in genomes of cellulase-producing microbes and the potential use of synthetic biology in this area, the costs associated with the production of cellulases in microbial reactors could remain to be a major factor inhibiting non-subsidized commercialization and sustainable economy of cellulosic biofuels.

The speaker will address the use of a petroleum industry model to expedite Biofuels market agenda along with a more effective and affordable Bioproducts agenda. Petroleum industry makes its profits not only from petro-fuels (gasoline or petrol, petrodiesel, ethane, kerosene, liquefied petroleum gas and natural gas), but also from over 6,000 petroleum-derivative co-products such as alkenes (olefins), lubricants, wax, sulfuric acid, bulk tar, asphalt, the solid fuel called petroleum coke, paraffin wax, and aromatic petrochemicals that are used for production of hydrocarbon fuels and hydrocarbon chemicals. Using the petro-industry model, scientists have recently pioneered systems on changing the genetic structure of certain bioenergy crops for production of high value recombinant bio-based co-products (Bioproducts) in crop waste matter (not in crop seeds, flowers or roots). Scientists have aimed at co-production of high value Bioproducts commodities in crop waste matter to boost the cellulosic biofuels industry revenues through direct use or extraction and sales of those novel products. Examples of cellulosic crop recombinant Bioproducts are; all three microbial cellulases (including a cellulase that is naturally produced by a microbe that lives in rumen of cow, a microbe that converts silage into energy in cow stomach), biodegradable plastic polymer, a natural human-origin anti-cancer biotech drug, a novel human saliva anti-HIV molecule, and more. The speaker will also address the challenges and potential solutions to the challenges in this area. Excellent presentations will also be made by other scientists during this summit on production of other recombinant Bioproducts in plants.

The use of the above petro-industry model will not only expedite the biofuels industry agenda, but also will reduce the costs of Biotech Drugs that are presently produced in microbes and sold at unaffordable costs.

Biography

Mariam Sticklen has been a faculty member for the last 29 years. She has served as consultant to the U.S. National Academy of Sciences on its NRC for over 10 years. She is the recipient of the MSU 2009 Outstanding Faculty Woman award, the 2008 University of Southern Mississippi and Hattiesburg Clinic Scholar Anti-HIV Speaker Award; and the 2000 Ralph Smuckler Award for Advancing Research, Studies and Programs at International level. Prof. Sticklen has published two books and over 160 articles. Presently, she serves as the Editor-In-Chief of one journal and as Editorial Board member of three other journals.

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