ISSN (ONLINE) : 2395-695X
ISSN (PRINT) : 2395-695X
Available online at www.ijarbest.com

International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST)
Vol. 2, Special Issue 8, February 2016 in association with
KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY, VIRUDHUNAGAR
DEPARTMENT OF BIOTECHNOLOGY
ORGANIZES
DBT, NEW DELHI SPONSORED NATIONAL LEVEL CONFERENCE ON CONTEMPORARY TRENDS IN BIOENERGY AND GREEN TECHNOLOGY: CHALLENGES AND OPPORTUNITIES [ORA-2016]
(25-26TH FEBRUARY 2016)

MICROBIAL FERMENTED CELLULOSE FUEL

Mariam Adhila.H
I Bsc Microbiology -Thassim Beevi Abdul Kader College For Women-Kilakarai, 623517

Abstract

Consolidated Bioprocessing is a system in whichcellulase production, substrate hydrolysis, and fermentation are accomplished in a single process step by cellulolytic microorganisms. It has very low production costs due to simple processing techniques , lower energy input and higher efficiency for conversion. My presentation consists of generation of biofuels from cellulose containing material through celullose metabolism by *Clostridium cellulolyticum*and increasing the fuel production yield through metabolic engineering. Cellulose fuels can replace fossil fuels as they are highly sustainable and reduce the greenhouse gas emission. Normally it is difficult to hydrolyze cellulose due to its crystalline structure and involve complex processes. But through CBP all the complications are solved in one step by use of microorganisms. The biofuel involved in this processing is Bio-Ethanol and Biohydrogen. This fuel is environmental friendly as it involves less CO2 emission. Cellulose is the most abundant linear, insoluble biopolymer and has a high degree of polymerization. Due to it is poor ability to degrade it is abundantly available in the environment for fuel production. Clostridia are ubiquitous in anaerobic soil environments, digest cellulose via an exocellular enzymatic complex called a cellulosome, converting cellulose into simpler forms. These are also used for breakdown for waste degradation. Cellulosome is the cellulose degrading enzyme.The cellulosome hydrolyzes the biopolymer to its building block, the disaccharide cellobiose and cellodextrins. Cellulosomes are able to hydrolyze both amorphous, and highly ordered crystalline cellulose.The transition from a fossil fuel-based economy to a biofuel-based economy depends on the improvement of biofuel yields via the successful development of suitable microorgansims capable of efficiently fermenting a variety of sugars.The application of recombinant DNA techniques to direct metabolism for industrial usage and for studies is called as metabolic engineering.Metabolic engineering seeks to improve cellular function through the modulation of enzymatic, transport, or other regulatory functions of the cell. The presentation will also consist of the steps of metabolism in Clostridium. Cellulose represents an attractive feedstock for biofuels production because of its abundance, cost and ability to be efficiently degraded by cellulolytic bacteria. In combination with other strategies including genomics, biodiversity studies and systems biology, metabolic engineering is a promising approach to the improvement of biofuel yields and the establishment of renewable, non-polluting energy sources.