

2012 SATU Joint Research Scheme

NCKU Project Host Center	Research Center for Energy Technology and Strategy
Project Title	Microalgae-based biofuels and biorefinery
NCKU PI / Co-PI	PI: Prof. Jo-Shu Chang, Department of Chemical Engineering, NCKU Co-PI: Prof. Wen-Tung Wu, Research Center for Energy Technology and Strategy, NCKU Dr. Chun-Yen Chen, Center for Bioscience and Biotechnology, NCKU
Foreign Co-PI	LING Tau Chuan/ Institute of Biological Sciences, Faculty of Science, University of Malaya
Date	2012.08. 20-22

Objectives

Since South Asia is the geographical area that contains the most abundant bioresources on earth. In particular, this area is also one of the best locations in the world for microalgae cultivation in terms of light supply, climate, and algae species diversity. Therefore, developing microalgae industry in this area is very suitable and has a high potential. To make the concept of microalgae industry a reality, many new technologies and engineering approaches should be developed (e.g., large-scale cultivation, biomass harvesting, product conversion technology, etc.). This project is aimed to develop key technologies required for realizing commercialization of biofuels and bio-based chemicals production using microalgae as the feedstock.

Collaborative Strategy

This study aims to isolate indigenous microalgal strains from Taiwan area. These microalgal isolates and their culture conditions will be provided to the collaborators to further enhance the biofuels production. This study will also develop high-density photobioreactor technology leading to efficient large scale production of microalgae rich in biofuel content. This bioprocess information will also be informative and beneficial to the research of other collaborators in this program. Therefore, Prof J.S. Chang is responsible for the research topic of microalgae biofuel production on NCKU side and has been working closely with Professor LING Tau Chuan for planning and conducting research projects to facilitate the international collaboration between NCKU and MU. In particular, Prof. Chang will provide some oil-rich microalgal strains for Prof. Ling to conduct biodiesel synthesis experiments using immobilized lipase as biocatalyst.

Future Perspectives

To elevate the level of microalgae platform technology, the NCKU microalgae team has developed more solid and in-depth technology to integrate multi-disciplinary concepts and to combine a variety of components in the microalgae system to develop a demonstration model for complete, efficient, environmental-friendly and commercially viable microalgae-based production. The team from UM will provide key technology on downstream applications of microalgae biofuels.