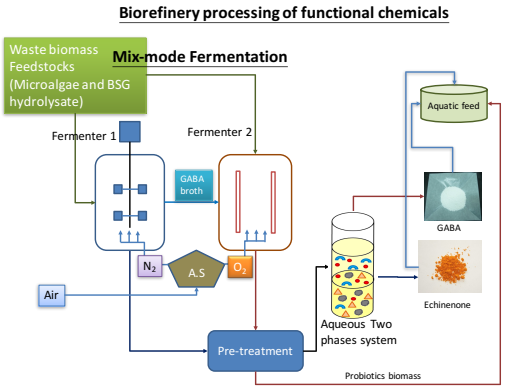
Biorefinery of Industry Waste for bio-based chemicals production

Prof. Dr John Chi-Wei Lan, Yuan Ze University, Taiwan

Abstract (300 word limit)

Currently, although biorefinery is gaining attention in proportion to its demonstrated benefits, certain technical requirements need to be met, and cost issues need to be resolved before effective commercialization can be achieved. In our research team, we are focusing on production of bio-based chemicals from industrial wastes using microorganisams. The food waste, soybean hydrolysate and brewers' spent grain, was applied as nitrogen and carbon source, respectively, in the integrated bioprocess system for the production and recovery of functional compounds. The results demonstrated the mix-mode fermentation can improve the product productivities and yields. The highest production concentration can reach 12.6 g/L and 890 mg/L for γ-Aminobutyric acid and echinenone, respectively. With the integrated aqueous two phase system, the recovery yield can achieve 92% and 67% for γ-Aminobutyric acid and echinenone through the sngle-step separation operation. In summary, the wastes from industrial sector dominate a significant impact on sustainable environment. The recycling of those waste to generate the valuable products via the bio-conversion technology can be one of promising processes.

Image



Recent Publications (minimum 5)

1. Ng et al., Direct recovery of mangostins from Garcinia mangostana pericarps using cellulase-assisted aqueous micellar biphasic system with recyclable surfactant, Journal of Bioscience and Bioengineering, 2019
2. Leong et al, Application of thermo-separating aqueous two-phase system in extractive bioconversion of polyhydroxyalkanoates by Cupriavidus necator H16, Bioresource Technology, 2019
3. Pakalapati et al., Development of polyhydroxyalkanoates production from waste feedstocks and applications, Journal of Biosciene and Bioengineering, 2019
4. Xu et al., Deciphering optimal biostimulation strategy of supplementing anthocyanin-abundant plant extracts for bioelectricity extraction in microbial fuel cells, Biotechnology for Biofuels, 2019
5. Lung et al., Docosahexaenoic acid production from crude glycerol by Schizochytrium limacinum SR21, Clean Technologies and Environmental Policy, 2016

Photograph



Biography (150 word limit)

John Chi-Wei Lan received his Ph.D in the School of Chemical Engineering from University of Birmingham (UK) in 2000. His doctoral research was dedicated to develop an efficient process to recovery of C595 diabody from fermentation broth using expanded bed technique in large scale production. He was a post-doctoral researcher at Academia Sinica (Taiwan) to work on bioprocessing design of feed-enzyme production from 2000 to 2003. He was also a research fellow in Yamaguchi University (Japan) and Industrial Technology and Research Institute (ITRI, Taiwan), respectively, before he joined Yuan Ze University (YZU) in 2007. He currently serves as the Professor at YZU and also the leader of Biorefinery and Bioprocess Engineering Laboratory (YZU). He has published more than 60 SCI journal papers and received the 2017 Young Asian Biotechnologist Prize awarded by the Society for Biotechnology, Japan. His research interests include enzyme and biorefinery technologies, bioseparation and electro-fermentation technology. g.

Email:
lanchiwei@saturn.yzu.edu.tw

Notes/Comments: