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EDITORIAL

13th International Biotechnology Symposium and Exhibition: Biotechnology for the Sustainability of Human Society

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Under the auspices of the International Union of Pure and Applied Chemistry (IUPAC), the 13th International Biotechnology Symposium and Exhibition (IBS-2008) was successfully held in Dalian, China from 12–17 October 2008. As the largest premier international conference in the rapidly growing field of biotechnology, it is the first time for the IBS to be held in China since its inception in Rome in 1960. With the theme of "Biotechnology for the Sustainability of Human Society", this conference has attracted over 2,500 participants from 80 countries and regions, demonstrating its far-reaching impact on the world of biotechnology. As the guest editors, it is our great honor to present eight selected papers from the conference, mainly covering two topics of biofuels and protein biotechnology in this thematic Section of *Biotechnology Letters* as a snapshot of this world event.

With the depletion of fossil fuels and global warming related to their consumption, biofuels and bioenergy from renewable biomass become a hot topic in both R&D and industry. As the largest coffee producer and exporter in the world, Brazil has millions of tons of coffee husks as the by-product from coffee processing. Franca et al. have explored the feasibility of ethanol production from coffee husks as agricultural residue in Brazil. The research demonstrated a good potential of ethanol production from coffee husks for biofuels uses. As the cleanest energy source, hydrogen energy has attracted global interest in both production and uses. Wang et al. have demonstrated that hydrogen can be efficiently produced from lignocellulose and cellulose using a sequential co-culture system of mesophilic cellulose degrading bacteria *Enterococcus gallinarum* and a hydrogen producing bacteria *Ethanoigenens harbinense* B49. This study presents a potential route in the conversion of renewable cellulose biomass into hydrogen energy. Similarly, Shi et al. demonstrated the production of hydrogen from kitchen wastes using anaerobic fermentation. The economic analysis indicated the hydrogen production cost from kitchen

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waste is lower than the hydrogen cost by the electrolysis of water. In the second generation biofuels development, microalgae have recently become a hot topic due to its potential of replacing the food crops to produce biodiesel at a lipid productivity no other biomass can compete. Matsunaga et al. selected a high neutral lipid producing marine microalga *Scenedesmus rubescens* suitable for biofuels production. At 100% artificial seawater, this microalga can accumulate up to 73% lipid of dry cell weight, with equivalent energy content of coal. In of the research on biodiesel production, Xu et al. have developed an integrated process of producing 1,3-propanediol from glycerol using lipase-catalyzed trans-esterification and fermentation. This study promotes the biorefinery approach to improve the economic feasibility of biofuels production, which is one of the greatest challenges for biofuels industry growth.

To enhance the abiotic stress tolerance in transgenic plant, Srinivasan et al. have overexpressed an *Arabidopsis NPR1* gene (non-expressor of pathogenesis related genes 1, *AtNPR1*) in transgenic tobacco plants, resulting in enhanced oxidative stress tolerance. This is the first demonstration of the novel function of heterologous expression of *AtNPR1* in oxidative stress tolerance in transgenic tobacco. In another study, Sattari et al. have isolated, cloned and expressed flagellin gene (*fliC*) from an opportunistic pathogen *Pseudomonas aeruginosa*. Flagellin subunits compose of a polar flagellum that plays important roles in motility, chemotaxis and establishment of *P. aeruginosa* in acute phase of infections. In the regenerative medicine, multipotent mesenchymal stem cells (MSCs) show a good potential, but difficulty in obtaining enough undifferentiated cells in the ex vivo expansion. Zhu et al. has established that β2-microglobulin (β2M) could act as a novel growth factor to stimulate the ex vivo expansion of undifferentiated MSCs to replace fetal bovine serum (FBS), which can elicit possible contaminations or immunological reaction for clinical application of MSCs.

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