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Editorial

Editorial for special issue on green biomanufacturing

Green biomanufacturing refers to the use of industrial biotechnology for the advanced production of biofuels, bio-based chemicals, and bio-products. It involves the concepts of cleaner production and circular economy, and aims at sustainable developments with enhanced energy and environmental systems. Green biomanufacturing is of great significance to the transformation and upgrading of traditional chemical industry. The past decade has witnessed the surge of new green biomanufacturing technologies such as innovation of industrial enzymes, construction of industrial strains, intelligent biomanufacturing processes and equipments, utilization of sustainable biomass, etc. These innovated techniques have led to intriguing applications in a diverse range of fields including biopharmaceuticals, energy, environment, textile, and so on.

To discuss the latest developments all over the world and explore future research directions in the field of green biomanufacturing, the International Conference on Green Biomanufacturing 2019 (ICGB 2019) was held on 22nd to October 24, 2019, in Beijing, China. The inspiration of organizing this special issue was enlightened by a number of cutting edge research presented at this conference. This issue provides a collection of 11 articles comprising five review papers and six research articles that introduce the latest advances and current challenges in green biomanufacturing.

The research article by Yu and colleagues describes a new strategy for the engineering of cell morphology by up- or down-regulation of *divIVA* and *ftsZ* gene expression levels. They found that the FtsZ-overexpressed *Corynebacterium glutamicum* exhibited improved single-cell production capacity of hyaluronic acid [1].

Xu and Edwards develop an ODE model containing 12 independent equations and 60 variables to study the dynamic mechanisms of a metabolic switch system. The depletion of the inducer arabinose enabled the automatic switch from cell growth to product formation. A corresponding GUI platform was also constructed to analyze the dynamic properties of different parameters [2].

Zhang and co-workers report the high-level production of tryptophan by simultaneously optimizing the precursor supply and regulating cofactor mechanism during the engineering of *Escherichia coli* [3].

In a short communication, Fang and colleagues focus on the reconstruction of transcription factor Cre1 to alleviate the carbon catabolite repression in *Trichoderma reesei*. They demonstrated that a *C*-terminal chimera could improve the transcriptional levels of cellulase in the presence of glucose and inhibit carbon catabolite repression [4].

The review by Zhou and co-workers provides an insight on how to fine-tune the metabolic networks in industrial microorganisms using advanced static control and dynamic control strategies to achieve the efficient production of useful compounds [5].

In another review, Zhang's group summarizes the latest research progress in the metabolic engineering of *Bacillus subtilis* chassis using systems biology, synthetic biology, and evolution-based engineering strategies [6].

Zhou and colleagues outline the recent advances in harnessing sub-organelle for isoprenoids biosynthesis in yeast, and summarize detailed strategies on how to localize enzymes, cofactors, and metabolites in different yeast organelles [7].

Song and co-workers provide a comprehensive overview of the recent advances in microbial electro-fermentation driven by bi-directional extracellular electron transfer for the biosynthesis of value-added chemicals and fuels. The perspectives on future applications of microbial electro-fermentation were also outlined [8].

The review by Fei and co-workers reflects diverse isolation and purification methods for the screening of methanotrophic bacteria. Several modern isolation techniques have been discussed along with the employment of microbial microdroplet culture (MMC) and room-temperature plasma (ARTP) systems in adaptive laboratory evolution [9].

The research article by Zhang and co-workers describes a simple method for the preparation of polyelectrolyte-doped microcapsule-based multienzyme system by combining the coaxial electrospray, ion pairing of enzyme, and layer-by-layer assembly technologies [10].

The short communication by Su and colleagues reports a dual-switch thermo/pH sensitive liposome for the controlled release of anticancer drugs by the self-assembly of temperature-sensitive cholesterol/cationic lipids as base layer and pH-sensitive octylamine grafted poly(aspartic acid) as anchors coated outside [11].

We hope this special issue will attract a broad readership in the field of green biomanufacturing, and the readers find it interesting and intriguing.

Finally, we would like to express our appreciations to the contributions of all the authors and reviewers, the big support and valuable suggestions from Prof. Lixin Zhang (Editor-in-Chief), as well as Dr. Wei Yan from KeAi Publishing for her hard-working in supporting this special issue.

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Yongqin Lv*, Haijia Su, Tianwei Tan
Beijing Key Laboratory of Bioprocess, College of Life Science and Technology, Beijing University of Chemical Technology, Beijing, 100029, China

* Corresponding author.
E-mail address: lvyq@mail.buct.edu.cn (Y. Lv).