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Editorial: The European Symposium on Biochemical Engineering Sciences, Dublin 2016

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The growing world population and increasing living standards on one hand result in higher natural resource consumption and on the other hand demand higher quality of products with significant ecological and economic impacts. More food, better health, active aging, cleaner water and better air are some of the major demands of the growing societies. A transformation in the industry is needed to meet these demands with low or no waste production, reduced release of greenhouse gases, using energy efficient and still cost effective and competitive manufacturing processes. Significant break-through progress is required to support this transition in the bio-industry sector. These include the optimization of strains and bioreactions based on new carbon source feedstreams, screening and engineering enzymes with optimal activity for instance in very viscous solutions or even solid matrices, the design of new bioreactors ensuring optimum distribution of nutrients and oxygen with minimal or no generation of gradients, increased production scales (where appropriate) and/or titers, intensified processes and novel separation technologies and processes suitable for processing both the large volume/low value and low volume/high value products.

In the biopharmaceutical industry, the maturation of technologies and tools such as genomics, proteomics, systems biology, and molecular modelling, and also the emergence of novel technologies, including bio-chips, stem cell technology, cell gene therapies, microfluidics and high throughput screening also demand significant developments in biochemical engineering. The integration of this knowledge in cross-disciplinary biochemical engineering activities and its translation into bioprocesses brings, for instance, new opportunities to design better therapies based on genes, stem-cells, monoclonal antibodies and nanobodies. To support this fast growing sector of biopharmaceutical industries, significant technological advancement is also needed.

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Biochemical engineering is pivotal to further develop and support the full transition to a bio-economy era. The new European Society of Biochemical Engineering Science (ESBES) has a relevant role in promoting the platform for excellent scientific discussion and bringing academia and industry together to translate innovation into action. ESBES brings together national chemical and biochemical engineering societies from across Europe, academia and industry to help translate knowledge into processes and products and to advance the education of future generations of biochemical engineers. ESBES organizes top level conferences and workshops to shape and design the future of process technology and industrial biotechnology to develop future economic activities, based on efficient, clean and sustainable manufacturing.

The European Symposium on Biochemical Engineering Sciences 2016 took place in Dublin in September 2016. This symposium represented an important landmark of the new ESBES society and brought together 268 paying participants of which 128 were students and 25% of the participants came from industry and small and medium-sized enterprises (SMEs).

This Special issue of the *Biotechnology Journal*, the official journal of the society, showcases some of the technical programe of the symposium and the advances and topics of interest in biochemical engineering, ranging from bioeconomy [1], sustainability and solvent free extractions [2], discovery and optimization of new biocatalysts [3], design of new biotherapeuticals [4], as well as new process control and design approaches based on modeling and predictive tools [5].

A range of review articles overview the state of the art in a broad areas from methodologies for exploring and controlling microbial populations [6] and biofilms [7]; manufacturing various important products, such as lipoproteins [8] and microbial biosurfactants [9], but also iron oxide nanoparticle-nanofibre composites [10] to challenges and opportunities in the application of cascading enzymatic microreactors [11] and microscale methods for cell disruption [12]. A selection of research articles then report on the latest research developments

in a range of areas that are going to be of interest to a wide readership base of the Biotechnology Journal. We hope you find these useful and hope to welcome you at the next ESBES Symposium in Lisbon in 2018.

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