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Editorial: Bioengineering for a better quality of life

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Biochemical engineering science has its roots in chemical engineering science and is an important discipline within biotechnology, which addresses several topics related with bio-product and bioprocess development and manufacturing. With an ever growing population demanding of more food and a better quality of life, the current and future demands of mankind are centered to provide products and technologies which are enabling more efficient energy production, clean water and air, active aging, and increased food quantity, security and quality.

The European Society for Biochemical Engineering and Science (ESBES) poses the question: "How can bioengineering contribute to such societal challenges?" To address this challenge, the ESBES aims to shape and design the future of process technology and industrial biotechnology to develop future economic activities, based on efficient, clean and sustainable manufacturing.

During the last ESBES symposium in 2014 in Lille, these topics were addressed and discussed. In this special issue of *Biotechnology Journal,* we cover the latest trends in biochemical engineering through a collection of selected articles which are representative of the symposium and the biochemical engineering trends and future directions. Traditional disciplines such as bioreactor and bioseparation engineering are given a novel perspective. Professor Andreas Lübbert reviews the trends on bioreactor control and its impact in bioprocess performance [1], and novel photobioreactor designs are reviewed by Heining and Buchholz [2]. Fermentation performance and optimization to maximize and facilitate the production of bioethanol and biofuels are addressed [3, 4]. There are two articles focus on the use of novel techniques and methodologies to monitor cell biomass in fermentations which are based on online flow cytometry [5] and impedance analysis [6]. Pathway engineering, knockout and metabolic engineering approaches are used to optimize cells and control the overproduction of target products [7–12]. Novel trends searching for new protein sources and biomass are covered by Sari et al. in their review on plant protein refineries [13] and by Oh et al. who describe a two phase fermentation system to maximize the utilization of *Laminaria japonica* as a biomass source [14]. Biochemical engineering is also an important field to enable cell therapies. Rodrigues et al. address the use of pluripotent stem cell for cell therapies and the clinical scale purification of the PSCs, as well as the scalable expansion of human mesenchymal stem/stromal cells isolated from human tissues [15]. In this special issue, new trends in bioseparation engineering are described. Of special interest is the novel use of existing technology such as aqueous two-phase systems [16] and protein precipitation which are shown to be very promising to operate in continuous mode for recombinant proteins [17] and monoclonal antibodies [18] purification.

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Importantly, this was the first official ESBES symposium after the establishment of the ESBES as an independent society. The *European Society of Biochemical Engineering Sciences* was officially announced in 2013 at the *2nd European Conference of Applied Biotechnology (ECAB)* at the Hague, the Netherlands. The success of this symposium clearly demonstrates the acceptance of the society by the international community and the recognition of the *European Society of Biochemical Engineering Sciences* as the representative body in Europe of Biochemical Engineers. The ambitions of the ESBES society are high and aiming at keeping the lead and paving the way to bioprocessing and biotechnological solutions for the major societal challenges. Our next major activities will be the joint meeting with the EFCE at the 3rd ECAB and 9th ECCE, which will be held in Nice, France in 2015 and the 11th ESBES symposium in Dublin, Ireland, 2016. For further information on ESBES and its activities, we invite you to visit our homepage (www.esbesweb.org). We would be pleased to see you in one of our events and invite you to actively contribute to our Society. We are also very proud to have *Biotechnology Journal* as our official journal and we want to thank our editorial team for the professional and quick handling of our manuscripts for better and more efficient dissemination of our research.

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