



February 5, 2018 **BLOG**

A Comprehensive Outlook on Industrial Biotechnology

A Comprehensive Outlook on Industrial Biotechnology and its Importance in the Fourth Industrial Revolution

(Expoquimia 2017, Barcelona)

The XPure systems team was recently present at Expoquimia 2017, in the beautiful city of Barcelona. We presented our new product XPure-E, which has been specifically designed for expanded bed adsorption (EBA) as part of the EU subsidized horizon 2020 project PRODIAS. This exhibition was organized in collaboration with WCCE (World congress for chemical engineering) and ECAB (European Congress for applied biotechnology). At the expo, we had the opportunity to interact with experts in the field of bioprocessing from different industrial sectors, both upstream and downstream processing. In the current blog, we present an overview of discussions on major challenges industrial biotechnology is targeting to address, state of the art developments and implementation status and a conclusion on how XPure systems can aid in addressing the challenges.

Challenge groups vs Industrial sectors

1. Circular economy is one of the major challenges of the 4th industrial revolution which is involving breakthrough technologies developed from a combination of physical, digital, and biological advancements, in order to achieve the PPP (people, planet, and profit) targets of several industrial sectors. Biorefineries and innovative bio-based solutions are contributing to circular economy both as a separate industrial sector and in synergy with traditional industries.
2. Healthcare and nutrition demands are continuously increasing with the growing population, and changing environmental conditions is further posing new problems to solve. Quality and regulatory requirements add another dimension to technology development and implementation.

State of the art developments and implementation status

1. The role of large-scale industries is quite crucial to achieve circular economy due to the sheer amount of mass and energy flows. At Expoquimia, keynote speakers from several multi-national companies discussed their state of the art developments and approach to fulfill the demands of circular economy with PPP

solutions, it includes

1. Increase the number of novel biomolecules that can replace traditional chemicals
 2. Along with capital, time is critical, and therefore it is important to make quick decisions. For example, curves representing profitability vs value of compounds when produced using existing traditional vs biobased processes represent that low-value molecules result in decreased profitability using biobased processes, which aids in business decision making. However, research should focus on changing this scenario (XPure systems is a potential technology in such a scenario with its ability to enhance profitability of low-value molecules)
 3. Gas fermentation which has been considered a farfetched fruit is now being implemented at a scale of 10,000-120,000 m³/year, both in Europe and the US in synergy with steel plants, to treat waste streams in the form of syngas and produce ethanol.
 4. Polylactic acid (PLA) and polyhydroxyalkanoates (PHA) from biobased lactic acid and polyhydroxy butyrate are growing to become platform molecules for several polymer industries. This reduces the carbon footprint generated by the traditional petrochemical-based polymers like PET and PC etc.
 5. Breakthrough technologies like electricity from photosynthetic energy shines a light on a brighter future
2. Healthcare and nutrition challenges are identified to have more dimensions, some of the points include that
1. Existing process platforms are of major concern compared to capacities and therefore product and process development need to be simultaneous
 2. A bridge between regulatory requirements and technology development is critical throughout the development process
 3. Novel technologies like plant stem cells for cosmetics, nutraceuticals, and API are being implemented at production scale. This method not only allows in selective production of target compounds but also reduces the carbon footprint and water consumption considering that it requires fewer processing steps.

PRODIAS

The PRODIAS horizon 2020 EU subsidized project is developing technologies targeted at the above. Xendo is taking part in this project which is aimed at reducing the processing costs of compounds from renewable sources in diluted aqueous systems. PRODIAS targets a holistic approach to developing upstream and downstream technologies meeting people, planet, and profit demands. [XPure systems](#) developed, as a result, can flexibly fit into the cost and regulatory model to achieve circular economy and meet demands of the health and nutrition industry due to the following reasons:

1. Reduced number of process units by implementing technologies like EBA, in Simulated Moving Bed (SMB) mode (planet, profit)
2. Reduced waste (people, planet)
3. Reduced demand of resources by 100 % utilization of buffers and resins (profit)
4. Easy scalability and flexibility to adapt to changing process conditions (people,

profit)

Conclusion

In view of the talks by professionals from various fields of Industrial Biotech and diverse organizational roles, it is concluded that the strong demand to balance sustainable products and processes with desired profitability makes it essential to simultaneously develop efficient upstream and downstream technologies. PRODIAS is working on these aspects and XPure happy to contribute to this with our [products](#).