

News Release

BASF and eight partners cooperate to optimize production processes for renewable-based products

- **PRODIAS (PROcessing Diluted Aqueous Systems) fosters competitiveness of the European process industry**
- **Aim is to decrease production costs for renewable-based products via increasing the efficiency of raw material use and production processes**
- **Project funding by European Union with €10 million – total budget is about €14 million**

Ludwigshafen, Germany – March 18, 2015 – A consortium of companies in the European process industry from the areas of biotechnology, renewable resources, chemistry, process engineering, equipment supply as well as research organizations recently launched project PRODIAS (PROcessing Diluted Aqueous Systems). The project focuses on unlocking the potential of renewable-based products made via white biotechnology, by significantly decreasing production costs, increasing productivity and efficiency, lowering energy consumption, and accelerating process developments.

Under the consortial leadership of BASF, the partners include: Cargill Haubourdin, France; University of Kaiserslautern, Germany; Imperial College London, Great Britain; Alfa Laval, Sweden; GEA Messo PT, the Netherlands; Xendo, the Netherlands; UPM, Finland, and Enviplan, Germany. These partners will collaborate to develop cost and energy-efficient technologies for water purification, removal

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Holger Kapp
Phone: +49 621 60-41040
holger.kapp@basf.com

BASF SE
67056 Ludwigshafen
Phone: +49 621 60-0
<http://www.basf.com>
Media Relations
Phone: +49 621 60-20916
Fax: +49 621 60-92693
presse.kontakt@basf.com

and product-recovery needed to support downstream processing in white biotechnology.

Using biotechnological methods such as fermentation or biocatalysis, in most cases the renewable-based products are produced as part of complex dilute aqueous mixtures from which they have to be purified. This includes the removal of a vast amount of water, making the downstream process energy intensive as it often requires many complex consecutive separation steps and thus hampers the cost-competitiveness of products from renewable resources. Furthermore, processing methods developed for chemical production are often used which are insufficiently adapted to biotechnological processes.

PRODIAS aims to address these challenges by developing and implementing cost-effective separation and purification technologies tailored for renewable resources in white biotechnology production processes. Its focus is to adapt separation techniques to the need of white biotechnology products and to design novel hybrid systems combining individual advantages, for example, selectivity and energy efficiency. The bioreactions (fermentations) and biocatalysis by which the valuable products are produced are subject to alteration and optimization, to enable more efficient and resource-saving downstream processing.

The total project budget is about €14 million with the European Union contributing €10 million. EU funding of the PRODIAS project is enabled via the Public-Private Partnership with SPIRE (Sustainable Process Industry through Resource and Energy Efficiency). SPIRE, in turn, is part of Horizon 2020, the EU framework program for research and innovation, which runs from 2014 to 2020 and comprises an €80 billion budget. In partnership with industry, the EU will invest in innovative technologies for sustainable processes. For more information, please visit the following websites: <http://ec.europa.eu/programmes/horizon2020>, www.spire2030.eu/projects

White biotechnology at BASF

White biotechnology is a key technology in BASF. It has the potential to manufacture products more efficiently than with conventional chemical processes. It is also useful for enabling completely new products not accessible using conventional synthesis approaches. BASF uses the biotechnological methods of fermentation and biocatalysis in order to manufacture products such as vitamins, enzymes and chiral chemicals.

About BASF

At BASF, we create chemistry – and have been doing so for 150 years. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future. BASF had sales of over €74 billion in 2014 and around 113,000 employees as of the end of the year. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the Internet at www.basf.com.