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Breakthrough in Rhamnolipid Mass-Production – Supra Molecular Complex improves health & environment characteristics of cosmetics, pharmaceutical and agricultural products

- **Industry first: Biotensidon with reliable technology for economically feasible rhamnolipid mass production**
- **Double-digit million Euros investment enables build-up of production capacity for 5,000 tons annual output**
- **Non-GMO supra molecular complex replaces chemical surfactants and boosts active substances in cosmetics and pharmaceutical products**
- **Biotech achievement to reduce toxic fertilizers in agriculture and prophylactic use of antibiotics in animal breeding (meat production)**

Karlsruhe (Germany) / Zug (Switzerland), December 12, 2016 -- As an industry first, German biotech company Biotensidon GmbH has developed the capability for cost-effective mass-production of rhamnolipids, which will be instrumental in improving the health and eco characteristics of many products in several industry sectors. Due to their positive properties, they will gradually replace synthetic surfactants with less positive side effects. Following Biotensidon's technological achievement, the company was awarded with the second place in Germany's prestigious Next Economy Award (Nature) last month. Moreover, Biotensidon's investor has injected a double-digit million Euros tranche into the start-up. The capital influx will be used to build up production capacity for an annual output of 5,000 tons of a new rhamnolipid-supra molecular complex. This amount suffices to produce very large quantities of antibiotics-free animal feed, environment-friendly fertilizers, detergents, de-greasing products and fire-extinguishing foams, as well as health- and eco-friendly cosmetics and pharmaceutical products.

Rhamnolipids are biosurfactants generated from non-pathogenic microorganisms through fermentation. Due to their excellent characteristics, rhamnolipids are the most effective eco-friendly and healthcare-positive biological agents, outperforming yeast-based biosurfactants. Hence, they are a key element of efforts to green several industry sectors. Moreover, rhamnolipids-based biosurfactants will ultimately also help reduce the use of oil from palm trees, the mass cultivation of which poses a major problem for conserving tropical rainforests.

In combination with pyoverdines and alginates, Biotensidon's rhamnolipids form one of the most effective and health- and environment-positive supramolecular complexes in the world (product name Rhapylnal). Rhapylnal is multifunctional and can be used for many purposes:

- Biological emulsifier and booster in cosmetics and pharmaceutical products, significantly reducing the required amount of active substances
- Natural (non GMO) seed coating in crop-cultivation, for yield-increase and to significantly reduce the need for ecologically difficult fertilizers; biodegraded after a few days, without residues



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- Biological antiviral, antibacterial, antifungal nutrition-additive for animal breeding, limiting or eliminating prophylactic use of synthetic antibiotics
- Ecologically neutral soil decontamination, in particular with oil spills.
- Fully biodegradable de-greasing product for industry and gastronomy
- Effective biological additive for foams used to extinguish wild fires, fuel fires, water-resistant fires and fireworks.

Until now, mass production of rhamnolipids has not been economically feasible. Scientific research on rhamnolipids has advanced in the new millennium but the production methods used in laboratories are not applicable to the fermenters required for mass production. Following several years of research, a team of Biotensidon scientists has recently developed a successful and reliable processing method. Output is now at above 30 g/liter, which makes production as cost-effective as with synthetic surfactants.

A second investment tranche from the original investor has now enabled Biotensidon to commence with the construction of a full-scale bioreactor site. Production capacity will start at 200 tons annually, advancing to 2,000 tons in 2018, to reach 5,000 tons of rhamnolipid products by 2019.

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For more information please visit our website. <http://biotensidon.de/index.php/news>

Contact:

Jörg Wiedemann
J. Wiedemann Kommunikation
Berlin

or

Rolf Hartmann
Member of The Board
Biotensidon AG Schweiz

Tel.: +49 30 80107769
e-Mail: j.wiedemann@wiedemann-pr.de

Tel.: +41 4176 31648
e-Mail: r.hartmann@biotensidon.de

About Biotensidon

German biotech start-up Biotensidon GmbH is a subsidiary of Swiss Biotensidon International AG. Founded in 2011, the company has become a leading producer of biosurfactants. Its Head Office and R&D and production sites are based in Karlsruhe/Bruchsal (Germany). The company's team currently consists of 20 experts in the fields of microbiology & biochemistry, bio engineering, general management, accounting & controlling, as well as sales & marketing. Biotensidon was recently awarded second place in Germany's prestigious Next Economy Award 2016, in recognition of its groundbreaking research on industrial application of eco-friendly bio agents.



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Biotensidon has achieved a major breakthrough in economically feasible mass production of rhamnolipids. Rhamnolipids are biosurfactants generated from non-pathogenic micro-organisms through fermentation. Just as effective as chemical or petroleum-based surfactants, rhamnolipids are 100 percent biodegradable. With low production costs, they will gradually succeed chemical surfactants as standard key ingredients of various product categories. They can be used as emulsifiers and boosters in cosmetics and pharmaceutical products, significantly reducing the required amount of active substances. They are also natural de-greasing agents. Modern-day soil decontamination, in particular oil spills, also relies on biosurfactants. Furthermore, using biosurfactants as seed coating in crop-cultivation drastically reduces the need for toxic fertilizers. Used as animal-feed additives in livestock farming, biosurfactants can limit the use of synthetic antibiotics. Due to their foam-building characteristics, biosurfactants are also valuable ingredients of effective and eco-friendly fire-extinguishing foams.

As an industry-first, Biotensidon has developed a unique fermentation method that ensures sufficient output of Rhamnolipids on an industrial scale (> 30 g/liter). The new technology simplifies the entire production process and significantly reduces costs. To become the world's leading mass producer of Rhamnolipids, the company has started a massive investment program and will have a full-scale production site ready in Germany by the end of 2019 (production volume 5,000 tons annually).

Biotensidon stands out as an innovative company in other fields as well. With its investment policy that emphasizes joint ventures in production over direct investments and Stock Market activity, the company offers flexibility in establishing production sites for various product groups and in various regions around the world.

Please find more information on Biotensidon at <http://www.biotensidon.de>.