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The biorefinery based on biotransformation by *Bacillus subtilis* of meal from oilseeds

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The most effective holistic approach of circular economy based on biotransformation of the agricultural biomass, which has been developed in the last few years, is the concept of biorefineries. In the biorefinery approach assuming zero waste, each process stream is exploited to the full through careful fractionation to produce commercially valuable products or through reuse of byproducts and wastes. The biorefinery approach has already been introduced to this area through a consideration of biodiesel and bioethanol, but very interesting seems multitude of other application especially in green chemistry to obtain high value added compounds. The main objective of the recent study is construction of demonstration plant focused on possibilities using GRAS microorganisms such as *Bacillus subtilis* in biotransformation meal remaining after oil extraction from oilseeds and subsequent fractionation. The key to this is the assertion that a complex mixed component material can be exploited in a variety of ways with some components used to produced new materials while others can be directly fractionated and separated into commercially highly valuable materials. Most of high value added products are synthesized in relatively low quantities e.g., biosurfactants making often the production process unprofitable. Thus, after their extraction the remaining biomass must also have an increased value as an end product, which could be complementary feed for animals as *Bacillus subtilis* var natto strains have probiotic properties. The realization of the demonstration biorefinery requires multidisciplinary approach and development of several dedicated methods such as Solid State Fermentation (SSF), fractionation using ecologically friendly solvents such as super critical carbon dioxide and centrifugal partition chromatography.

Biography

Marcin Lukaszewicz is working as an associate professor at the Department of Biotransformation, University of Wrocław, Poland. He has done research on the optimization of lipopeptide biosurfactants production, methanogenesis and biocalcification. His research work also includes the model complexes agro-power as an example of dispersed cogeneration based on local and renewable energy sources.

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