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## **Insilico and Partners Exploit Methanol as Raw Material for Industrial Bioproduction**

**(Stuttgart) – Insilico Biotechnology is currently testing the use of methanol as a raw material for microbial bioproduction together with eight other project partners. Insilico’s complex simulation models will help to form a solid base for building up a cost-effective eco-friendly cell factory, the long-term goal of the joint research.**

Up to now, industrial biotechnologists have mainly used sugar to “feed” microorganisms bred to produce valuable bioproducts (e.g. fine chemicals) for industrial use. As most types of sugar come from plant sources such as cane or cereals, conservative food producers are becoming faced with increasing competition from the field of industrial bioproduction, now a fast-growing branch with enormous potential for the future. Insilico and its European project partners would like to improve this situation, especially as most sugar raw materials are produced outside of Europe and have to be imported. Another argument in favor of substituting methanol for sugar is that it has a production capacity of approx. 46 million tons per year, which hardly anyone is exploiting. At present, methanol is derived mainly from natural gas but it can also be produced from biogas.

The knowledge that bacteria exist which can utilize methanol on principle is not new but the essential information on their metabolic processes has only recently become available. Together with modern methods for intervening on the genetic and molecular level, this makes it possible to put the metabolism of methanol to economic use. The research partners are following a triple strategy. First, metabolic modules which can process methanol will be transferred from methylotrophic bacteria to classical production strains, such as *E. coli*, in order to reprogram the latter to feed on methanol. Then the team will test this procedure the other way round to find out if it is worthwhile to integrate metabolically effective production modules in methylotrophic bacteria. Finally, the joint partners will apply synthetic biotechnology to develop highly efficient metabolic paths with the aim of avoiding competition with food producers. To this end, production modules and metabolic modules which can utilize methanol will be combined in completely new production strains.

Insilico Biotechnology will support all three parts of this innovative EU project with its core competence in the modeling of metabolic processes. The Insilico team will simulate new combinations of metabolic steps and modules to find out how they react on both the molecular and cell level. Together with its partners, Insilico will also develop and test new approaches to monitoring substance flows. The performance and efficiency of methanol-based bioproduction will be simulated, aided by a continuous stream of feedback from real experiments. “We still have a lot of details to clear up, for example whether a higher concentration of methanol in the fermenter will impede cell production or not. We also want to ensure that classical production strains will not lose any of their vitality after metabolic modules which can utilize methanol have been introduced”, explains Klaus Mauch, Insilico’s CEO. Insilico’s highly effective models and high-performance computing will ensure that these problems are solved efficiently.

# Press Release



The project entitled PROMYSE (Products from Methanol by synthetic Cell Factories) started in November 2011 and will receive approx. three million EUR over the next three years. Insilico's partners in Germany are DECHEMA, BASF and Bielefeld University. The project is managed by SINTEF, a Norwegian research institution.

**Insilico Biotechnology** reconstructs, simulates and predicts the performance of complex cellular systems for the chemical and pharmaceutical industries. Successful in business since 2001, Insilico has internationally renowned expertise and a unique technology platform for connecting cell model libraries with simulation processes. Insilico analyses the latest biotech data and integrates it in mechanistic whole-cell network models. With its high-performance computing techniques, Insilico develops superior solutions for manufacturing biochemicals and biopharmaceuticals and achieves considerable cuts in the time needed for drug toxicity tests. Insilico is a privately-owned company, located in Stuttgart, Germany.

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