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**Bärbel Hahn-Hägerdal** is professor of Applied Microbiology at LTH/Lund University, Sweden. Her research concerns the development of industrial strains of yeast for the fermentation of lignocellulosic hydrolysates with special emphasis on recombinant pentose fermenting strains of Saccharomyces cerevisiae. She received a Ph. D. in Biochemistry from Lund University followed by a post-doctoral fellowship at the University of Pennsylvania, USA. Bärbel Hahn-Hägerdal has been a visiting scientist at AIST, Tsukuba, Japan, and a visiting professor at universities in South Africa and Brazil. She serves as Swedish representative on the IEA task "Bioconversion of Lignocellulose" and on the International Commission for Yeast. Bärbel Hahn-Hägerdal has coordinated national, Nordic and EU research projects with focus on metabolic engineering applied to bioenergy. Her research has resulted in more than 250 publications, and a portfolio of patents and patent applications. Under her supervision more than 30 PhD students have graduated. She is regularly engaged in reviewing research papers for international scientific journals and research proposals for the EU and for scientific societies in Europe and overseas. She serves on the board of the Swedish Research Council. Bärbel Hahn-Hägerdal was honored with the Charles D Scott Award 2008.

**Title: Engineering *Saccharomyces cerevisiae* strains for bioconversion of lignocellulose**

**Abstract:** Lignocellulose raw materials are composed of cellulose, hemicellulose and lignin, and require pre-treatment at elevated temperatures with acid or base to make cellulose and hemicellulose accessible to subsequent acid or enzymatic hydrolysis. Cellulose and hemicellulose are hydrolyzed to fermentable monomer C6 and C5 sugars (glucose, mannose, galactose, xylose and arabinose), while lignin may be recovered as fuel. During pre-treatment and hydrolysis fermentation inhibitors – phenol and furan derivatives and low molecular weight fatty acids - are also released. Hydrolyzed lignocellulose raw materials thus comprise a mixed-sugar substrate in an inhibiting matrix. The yeast *Saccharomyces cerevisiae* has been used throughout recorded human history to produce bread, beer, and wine and is, due to its robustness, currently the prime choice for industrial ethanol production.

Genetic engineering allows construction of new *S. cerevisiae* strains that can effectively consume not only the C6 sugars in lignocellulose hydrolysates, but also the C5 sugars xylose and arabinose. Various metabolic engineering strategies as well as random methods such as breeding, adaptation/evolutionary engineering and mutagenesis are generally used to produce such strains. We have constructed rationally designed and engineered yeast strains with effective C5 fermentation performance. Improved strains utilizing the pentose (C5) sugars xylose and arabinose have been developed, as well as strains with improved inhibitor tolerance to be exploited in the future biofuels and biorefinery industries based on renewable lignocellulose raw materials.