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AUSTRALIA'S BIOTECHNOLOGY CONFERENCE

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Conference

19 to 22 October 2010
Melbourne Convention and Exhibition Centre
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AUSBIOTECH 2010 NATIONAL CONFERENCE SPEAKERS' PROFILE

Jens O Krömer
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Queensland**

Since his research career started in 2002, Jens major research interest lays in the area of Systems Biotechnology. This means the combination of 'omics techniques with *in-silico* modelling for the deeper understanding of the functionalities of biological systems and the use of this understanding for design of new biocatalysts. Those 'omics techniques comprise analysis of active genes (transcriptomics and proteomics), the quantification of intracellular metabolites (metabolomics) and the quantification of intra- and extracellular reaction rates via measurement and simulation (fluxomics). This approach plays not only an important role in optimization of systems but also helps to fundamentally understand functionalities of living systems.

In one of the first studies of its kind, within his diploma thesis, Jens applied this technology to L-Lysine producing *Corynebacterium glutamicum*, the most important industrial amino acid producing organism. This work was published in 2004 and honoured with the European Federation for Biotechnology "Young Scientist Poster Award, 2003". In the following years he applied the same principles to *Escherichia coli* and during his PhD thesis to *C. glutamicum* for the development of a L-Methionine producing strain. Facilitator for these works was extensive method development for metabolite analysis. The work on "Systems Biotechnological Studies on *C. glutamicum*" was rewarded with the PhD in 2006, and honoured in the following year by the "Dr Eduard Martin Preis" of The Saarland University (Germany) for the best PhD thesis in the faculty 2006. It not only led to a number of



publications but also significantly contributed to three international patents (WO2007020295; WO2007051725, WO2007135188) filed by the commercial project partner BASF.

Since his arrival at University of Queensland (UQ), Jens focussed on the development of systems biological tools, especially metabolomics and fluxomics, as platform technologies and the adaptation to industrially relevant processes. Together with Prof Lars Nielsen, he established a critical mass in the area of metabolomics, fluxomics and *in-silico* analysis of industrial microbes at the University of Queensland.

Currently, his research focuses on the use of bakers yeast as a production host for aromatic chemicals and isoprenoid biofuels. In these projects systems biotechnology is the tool-box of choice in order to rationally design the production organisms. *In silico* modelling complements the strains design and is currently also part of industry consulting contracts looking into economic feasibility of bioprocesses for the bio-production of petrochemical replacements.