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Name	Julia Frunzke-Wennerhold
University	Jülich Research Centre (D)
Department	Institute of Biotechnology
PhD Supervisor	Prof. Dr. M. Bott

White biotechnology uses cells or enzymes as biocatalysts for industrial production, e.g. of amino acids, vitamins, fine chemicals, or proteins. The development of new microbial production strains optimized for synthesis of the desired target molecule requires in-depth knowledge of metabolism and its regulation. Consequently, there is a clear trend to use few selected model organisms as platforms for the production of a variety of different compounds. One of these is *Corynebacterium glutamicum*, a large-scale producer of amino acids. The work of Julia Frunzke focused on the elucidation of global regulatory networks in this organism. Her results disclose the great impact of iron availability on central metabolic pathways like the citric acid cycle, which provides the biosynthetic precursors of many amino acids and other commercially relevant compounds. Furthermore, key regulators were discovered which control uptake and metabolism of carbon sources and enable *C. glutamicum* to use the available substrates in the most favorable combination. The results of Julia Frunzke provide significant advances towards a systems biological understanding of *C. glutamicum* and the basis for new metabolic engineering strategies.