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Molecular basis of human body odor formation: Insights deduced from corynebacterial genome sequences

Andreas Tauch
Bielefeld University, Germany

The microflora of the human armpit plays a key role in the formation of axillary odor by biotransformation of odorless natural secretions into volatile odorous products. Microbiological and biochemical studies allowed the characterization of the axillary microbiota and the identification of the major chemical classes associated with body odor. Especially aerobic skin corynebacteria contribute to human axillary odor formation. The axillary isolate *Corynebacterium jeikeium* K411 has been established as a model system to examine the metabolic abilities of the skin microbiota contributing to axillary odor. *Corynebacterium jeikeium* is also known as a multidrug-resistant species that has been recognized with increasing frequency as a serious nosocomial pathogen. The complete gene repertoire and the deduced lifestyle of *Corynebacterium jeikeium* K411 largely reflect the dependence of growth on the presence of exogenous fatty acids. A complete enzyme set necessary to degrade fatty acids was detected in the cytoplasmic proteome fraction. A reconstructed gene-regulatory network comprises 48 transcriptional regulators and 674 gene-regulatory interactions that were assigned to five functional modules. Most genes involved in lipid degradation are under the control of the global transcriptional regulator GlxR and the LuxR-family regulator RamA, probably reflecting the essential role of lipid degradation. DNA affinity chromatography identified the MarR-like protein FamR as a novel regulator of fatty acid metabolism. Binding of GlxR and FamR to *fad* gene regions was demonstrated by DNA band shift assays. These results shed first light on the hierarchical control of lipid metabolism in corynebacteria, a pathway associated with the development of axillary odor.

Biography

Andreas Tauch received his Ph.D. from Bielefeld University in 1996. After postdoctoral studies in industrial R&D, he joined the Center for Biotechnology (CeBiTec) at Bielefeld University in 2000. Since 2008 he is Associate Professor (Privatdozent) at the CeBiTec and the head of the scientific research group “Medical Microbiology and Genomics”. He has published more than 110 papers in reputed journals and is a faculty member of the CLIB Graduate Cluster “Industrial Biotechnology”.

tauch@cebitec.uni-bielefeld.de