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Genetics meets metabolomics

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Scientists at Helmholtz Zentrum Munich and LMU Munich, in cooperation with Wellcome Trust Sanger Institute and King's College London (KCL), have identified several associations between genetic variants and specific metabolic changes. The study, published today in *Nature,* provides new functional insights regarding associations between risk factors and the development of complex common diseases.

In the study appearing today in the journal *Nature*, the researchers identified 37 previously unknown genetic risk loci, elucidated their effect on human metabolism and found clear associations to complex common diseases such as type 2 diabetes mellitus. Professor Karsten Suhre and Dr. Christian Gieger of Helmholtz Zentrum München, together with colleagues from the Wellcome Trust Sanger Institute in the UK and King's College London under the leadership of Nicole Soranzo, conducted this research to gain in-depth insight into the etiology of disease. In the study, the scientists present the most comprehensive evaluation of genetic variance in human metabolism so far, combining genome-wide association studies (GWAS) with metabolomics. Over 250 metabolites were analyzed from 60 disease-relevant metabolic pathways.

"The advantage of our study design," Suhre and Gieger said, "is that we studied genetic variance in its biological context – and thus identified previously unknown risk loci." By combining genetics and metabolomics, a method which already yielded promising results in two previous studies, the scientists were able to evaluate the biological effect of the identified genetic risk loci. In stand-alone GWAS this is not possible.

Every individual is unique – a closer look at the individual's metabolites could enable a better evaluation of the risks for developing complex common diseases in the future. "We have made considerable advances in understanding complex diseases such as type 2 diabetes mellitus," the two scientists said. "The findings of the study will lead to new approaches for pharmaceutical research."

More information: Human metabolic individuality in biomedical and pharmaceutical research, Suhre K., et. al. *Nature* online, 1. September 2011

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