

## Press Release

### **Genes Cause Elevated Urate Concentrations That Can Lead to Gout**

Neuherberg, January 8, 2013. **Uric acid homeostasis is controlled by more genes than previously known. By means of a genome-wide association study, scientists of Helmholtz Zentrum München identified a total of 28 genes associated with blood urate concentrations. 18 loci were newly identified; for 2 loci the researchers found an association with gout. Their findings were recently published in the journal Nature Genetics.**

Elevated blood urate concentrations can lead to attacks of gout, a painful inflammation in the joints. High urate levels tend to run in families: about 40 to 70 percent of the cases are due to familial predisposition. In an international cohort study combining data from 140,000 individuals, 28 genes could be linked to uric acid homeostasis. For 18 of these loci the association was previously unknown; in addition, two gene loci showed an association with gout flare-ups. Uric acid is a metabolic product of the liver, and excess meat consumption, in particular, leads to the production of increased quantities. It is mainly excreted by the kidneys. Elevated levels of urate in the blood can cause crystals to form within the joints and trigger an inflammatory reaction there. The identified genes thus not only influence urate concentrations in that less uric acid is excreted, but also influence uric acid production and its homeostasis.

The international research team of the Global Urate Genetics Consortium (GUGC) analyzed data from Europe, Japan, Australia and the U.S. Data from Germany were provided by KORA (Cooperative Health Research in the Augsburg Region), among other institutions. At Helmholtz Zentrum München scientists of the Institute of Genetic Epidemiology (IGE), the Institute of Bioinformatics and Systems Biology (IBIS), the Department of Molecular Epidemiology (AME) and the Institutes of Epidemiology I and II (EPI I+II) participated in the gene analysis. Eva Albrecht (IGE) and Jan Krumsiek (IBIS) are the lead authors of the publication in Nature Genetics. The following scientists from the above-mentioned units also contributed to the publication: Angela Döring, Konstantin Strauch, Norman Klopp, Melanie Waldenberger, Eva Lattka, Fabian Theis, H.-Erich Wichmann, Annette Peters and Christian Gieger.

In further projects, the researchers want to explore the molecular processes that control uric acid homeostasis. "When we know the genes and signaling pathways involved in elevated urate concentration and its consequences, we can develop new strategies for treatment and prevention," said Dr. Christian Gieger of the IGE and last author of the study.

### **Further information**

#### **Original publication:**

Köttgen, A. *et al.* (2012). Genome-wide association analyses identify 18 new loci associated with serum urate concentrations, Nature Genetics, doi: 10.1038/ng.2500

Link to journal publication: <http://www.nature.com/ng/journal/vaop/ncurrent/full/ng.2500.html>

**Helmholtz Zentrum München**, as German Research Center for Environmental Health, pursues the goal of developing personalized medical approaches for the diagnosis, treatment and prevention of major widespread diseases such as diabetes mellitus and lung diseases. To achieve this, it investigates the interaction of genetics, environmental factors and lifestyle. The head office of the Center is located in Neuherberg in the north of Munich. Helmholtz Zentrum München has a staff of about 2,000 people and is a member of the Helmholtz Association, a community of 18 scientific-technical and medical-biological research centers with a total of about 34,000 staff members. Helmholtz Zentrum München is a partner in the German Center for Diabetes Research. [www.helmholtz-muenchen.de](http://www.helmholtz-muenchen.de)

For more than 20 years, the research platform **Cooperative Health Research in the Augsburg Region** (KORA) has been collecting and analyzing data on the health of thousands of people living in the Augsburg region. The objective is to elucidate the effects of environmental factors, behavior and genes. KORA focuses on the development and course of chronic diseases, in particular myocardial infarction and diabetes mellitus. Risk factors are analyzed with regard to individual health behavior (e.g. smoking, diet, exercise), environmental factors (e.g. air pollution, noise) and genetics. From the perspective of health care research, questions regarding the utilization of health care resources and the cost of health care are also studied. [www.helmholtz-muenchen.de/kora](http://www.helmholtz-muenchen.de/kora)

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