

## Genetic link to vitamin D insufficiency

New research shows that genetic factors affect the risk of a person having vitamin D insufficiency. The research, which was jointly led by the Twin Research Unit at King's and Harvard University, is being published online today and in an upcoming edition of *The Lancet*.

Vitamin D is crucial for maintenance of musculoskeletal health, and might also have a role in extraskelatal tissues. Determinants of circulating vitamin D concentrations include sun exposure and diet, but previous work showing clustering of low vitamin D concentrations within families and twins suggests that genetic factors also play a part. In this study, the authors aimed to identify common genetic variants affecting vitamin D concentrations and risk of insufficiency.

The authors did a genome-wide association study of almost 34,000 white people of European descent from 15 studies. A range of conventional techniques, including radioimmunoassay and mass spectrometry, were used to determine serum vitamin D concentrations. Vitamin D insufficiency was defined as concentrations lower than 75 nmol/L or 50 nmol/L.

Variants at three genetic sites or 'loci' were significantly associated with vitamin D concentrations. These loci were near genes involved in cholesterol synthesis, vitamin D metabolism, and vitamin D transport. Participants with a genotype score (combining the three confirmed variants) in the highest quartile (the 25 per cent at greatest risk) were at two-and-a-half times increased risk of having vitamin D concentrations lower than 75 nmol compared with those in the lowest quartile (the 25 per cent at lowest risk).

Professor Tim Spector, Director of the Twin Research Unit at King's comments: *'Previous research had suggested that genetic factors could play a part in vitamin D insufficiency, as vitamin D insufficiency showed a high heritability. Our study confirms this based on the finding of a genetic link to low vitamin D levels. The improved understanding of vitamin D regulation from our study could help to identify those within the white population who are most at risk of vitamin D insufficiency. Vitamin D plays an important role for our health, so knowing who is most at risk may help to prevent certain health risks through extra supplementation.'*

In their article the authors point out that the study included only white individuals of European descent. Whether the genetic variants identified also affect vitamin D status in other racial or ethnic groups is unknown and requires further study.

### Notes to editors

The article *Common genetic determinants of vitamin D insufficiency: a genome-wide association study* by Professor Tim Spector, King's College London; Dr Elina Hyppönen, UCL Institute of Child Health; and Dr Thomas J Wang, Massachusetts General Hospital can be found on The Lancet website ([www.thelancet.com](http://www.thelancet.com)). The research was undertaken in collaboration with international colleagues from the SUNLIGHT (Study of Underlying Genetic Determinants of Vitamin D and Highly Related Traits) consortium. SUNLIGHT is the biggest genetic epidemiology consortium for vitamin D worldwide.