

Gene sequence that can make half of us fatter is discovered

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A gene sequence linked to an expanding waist line, weight gain and a tendency to develop type 2 diabetes has been discovered as part of a study published today in the journal *Nature Genetics*.

The study also shows that the gene sequence is significantly more common in those with Indian Asian than European ancestry. The research, which was funded by the British Heart Foundation, could lead to better ways of treating obesity.

Scientists from Imperial College London and other international institutions have discovered that the sequence is associated with a 2cm expansion in waist circumference, a 2kg gain in weight, and a tendency to become resistant to insulin, which can lead to type 2 diabetes. The sequence is found in 50% of the UK population.

“Until now, we have understood remarkably little about the genetic component of common problems linked with obesity, such as cardiovascular disease and diabetes,” said Professor Jaspal Kooner, the paper’s senior author from the National Heart and Lung Institute at Imperial College London. “Finding such a close association between a genetic sequence and significant physical effects is very important, especially when the sequence is found in half the population.”

The study shows that the sequence is a third more common in those with Indian Asian than in those with European ancestry. This could provide a possible genetic explanation for the particularly high levels of obesity

and insulin resistance in Indian Asians, who make up 25% of the world's population, but who are expected to account for 40% of global cardiovascular disease by 2020.

The new gene sequence sits close to a gene called MC4R, which regulates energy levels in the body by influencing how much we eat and how much energy we expend or conserve. The researchers believe the sequence is involved in controlling the MC4R gene, which has also been implicated in rare forms of extreme childhood obesity.

Previous research on finding the genetic causes of obesity has identified other energy-conserving genes. Combining knowledge about the effects of all these genes could pave the way for transforming how obesity is managed.

“A better understanding of the genes behind problems such as diabetes and cardiovascular disease means that we will be in a good position to identify people whose genetic inheritance makes them most susceptible,” added Professor Kooner. “We can't change their genetic inheritance. But we can focus on preventative measures, including life-style factors such as diet and exercise, and identifying new drug targets to help reduce the burden of disease.”

The research was carried out as part of the London Life Sciences Population (LOLIPOP) study of environmental and genetic causes of cardiovascular disease, diabetes and obesity in approximately 30,000 UK citizens of Indian Asian and European ancestry. The scientists looked at the association between unique genetic markers, called single nuclear polymorphisms, and physical traits linked with obesity, such as waist circumference and insulin resistance.

“The studies we carry out through LOLIPOP are providing unique and important data,” explained lead author Dr John Chambers from the

Department of Epidemiology and Public Health at Imperial College London. “The number of people involved, the comparisons between two ancestries, and the detail with which we can explore genetic and environmental effects are helping us identify crucial linkages.”

Source: Imperial College London

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