

Researchers study genomic regions related to obesity

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A new study has helped to shine light on the genetic pathways underlying obesity. The findings could help researchers to develop more personalized weight management plans.

The work is the largest study of its kind looking at genomics and levels of metabolites, the molecules produced when the body breaks down food. It reports 74 previously unknown genomic regions that influence how people's bodies break down food into energy.

The work was supported by the National Institute for Health Research (NIHR) Guy's and St Thomas' Biomedical Research Centre. The team behind the study were from the Department of Twin Research and Genetic Epidemiology, King's College London and the NIHR BioResource.

The study involved 8,809 people who had joined the NIHR BioResource. The BioResource is a bank of individuals who consented to be contacted about research projects.

The team looked at blood samples to measure levels of 722 metabolites. These provide a snapshot of an individual's wellbeing and the mechanisms that control key physiological processes. Metabolite levels can be affected by nutrition, drugs and the gut microbiome. However, the way the body breaks down food is known to be strongly driven by a person's genetics.

From analyzing these alongside [whole genome sequencing](#), the team identified 202 unique genomic regions whose variations are associated with the levels of 478 different metabolites. These included 74 genomic regions not associated with any metabolites in previous works. They confirmed the findings in an independent cohort of 1,768 people.

Senior author Dr. Cristina Menni from the Department of Twin Research and Genetic Epidemiology, King's College London said: "These results could have many practical implications. Human metabolism underlies a lot of different areas of human health and disease. Our findings could help understand certain diseases.

"Some of the metabolites we looked at are linked to BMI and could give us an insight into obesity in some individuals. It is very early research, but in the future these findings could help to develop approaches to maintaining a healthy weight which take into account a person's genetic profile."

Dr. Massimo Mangino, senior bio-informatician from the NHIR Guy's and St Thomas' Biomedical Research Centre and lead author of the study, said: "Obesity is one of the most common conditions, and yet there's still so much we need to understand about its biological mechanisms. Our latest findings may help to unravel some of them. Genetic studies hold real promise in helping us find new treatments for obesity. By teasing out the complex relationships between different genes, we have a huge opportunity to turn the tide against this condition."

Dr. Pirro Hysi from the Department of Twin Research and Genetic Epidemiology added: "This study is the largest scale study of its kind of [metabolite](#) levels to date and its results enhance our knowledge of genetic mechanisms controlling human metabolism. The NIHR BioResource is a unique UK resource made possible by the amazing collaboration between doctors and researchers in the NHS. It's because of collaborations like this that large scale studies like ours are possible."

The World Health Organisation estimates that over 4 million people die each year as a result of being overweight or obese.

More information: Pirro G. Hysi et al, Metabolome Genome-Wide Association Study Identifies 74 Novel Genomic Regions Influencing Plasma Metabolites Levels, *Metabolites* (2022). [DOI: 10.3390/metabo12010061](#) www.mdpi.com/2218-1989/12/1/61

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