

# Body mass may be more nurture than nature

31 October 2013

The influence of genes on body mass index scores is substantially lower than previously thought, researchers at The University of Queensland have found.

The research, conducted in [Professor Peter Visscher](#)'s laboratory at the [Queensland Brain Institute](#) (QBI) and [Diamantina Institute](#) (DI), provides new insight into the genetic causes underlying a person's score on the body mass index (BMI).

Lead researcher [Dr Gibran Hemani](#) says there is debate as to the degree to which genetics contributes to BMI.

"Some studies claim that more than 80 per cent of BMI is due to genetic factors with less than 20 per cent being driven by environmental factors, whereas others have put the figure much lower.

"We wanted to come at the question from a different angle, using very large and complex sets of data and a method that is more reliable than previous studies," Dr Hemani said.

Human DNA varies at millions of positions across the genome, and trying to figure out if, how, and how much, these genetic variations lead to differences in BMI is gradually becoming understood.

Dr Hemani and his colleagues from Australia and Europe obtained DNA data on 20,240 pairs of siblings.

On average, if an individual has a variant at a particular position in the genome then his or her sibling will have a 50 per cent chance of sharing that same variant.

By counting the total number of DNA variants shared across the whole genome, the team could identify how genetically similar (or dissimilar) each pair of siblings was to each other.

They found that although on average siblings were 50 per cent genetically identical, the exact figure varied from about 35 per cent to 65 per cent meaning that some sibling pairs are more genetically similar than others.

Using this method, Dr Hemani and his colleagues calculated whether siblings who were more genetically similar were on average more similar in terms of BMI.

The group found that 42 per cent of BMI is under the influence of genetics.

Dr Hemani said the study also has contributed in other ways in trying to understand how genetics influence BMI.

"We know that there are a huge number of variants across the genome, but how many of them actually have a direct influence on a complex trait like BMI?

"This is an important question because many researchers who study disease are focussed on one particular genetic change or a gene of interest as the cause of the disease; however, there is growing evidence, including from this study, that disease is caused by thousands of small changes and it's the additive effect of these changes that results in disorder."

This research paper, "Inference of genetic architecture underlying BMI and height using 20,240 sib-pairs" is published online in *The American Journal of Human Genetics*.

Dr Hemani is available for media interviews.

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Queensland Brain Institute

The Queensland Brain Institute (QBI) at the University of Queensland (UQ) is a world-leading research facility focused on discovering the fundamental mechanisms that regulate brain function.

Unlike research institutes that focus on a specific disease or condition, QBI is structured to study the brain's fundamental molecular and physiological mechanisms.

QBI researchers are working to unlock the mysteries the neurodegenerative disease and mental health disorders which currently account for 45 per cent of the burden of disease in Australia. [QBI](#)

Diamantina Institute The University of Queensland Diamantina Institute (UQDI) is a modern research facility where clinical and basic science converge in the translational research of cancer and disorders of immune regulation.

Headed by Professor Matthew Brown, the Institute is host to more than 200 researchers, students and support staff.

It lays claim to global, world-changing discoveries such as the world's first cervical cancer vaccine.

Based at Brisbane's leading teaching hospital, the Princess Alexandra Hospital, The University of Queensland Diamantina Institute has strong clinical interactions and world-class facilities that enable researchers to be at the forefront of their fields. Our researchers focus their efforts on turning their scientific discoveries into better treatments for diseases including a variety of cancers, osteoporosis, arthritis and other autoimmune diseases. [DI](#)

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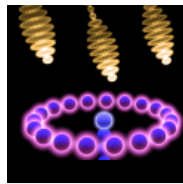


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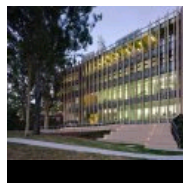
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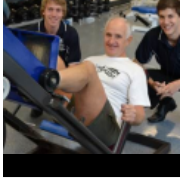


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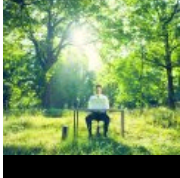


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