

Diet or DNA: are we fated to be fat?

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(Medical Xpress) -- Marks on the genetic ‘code’ that babies have at birth are different for children who go on to be obese or overweight compared to those who do not, new research from the universities of Newcastle and Bristol has found.

Using blood from 178 babies’ umbilical cord, researchers analysed [genes](#) that are known to be linked to body [weight](#) and found that nine of the 24 relevant genes looked at in this study were linked to the child’s weight at age nine. The findings are published in *PLoS ONE* today.

Professor Caroline Relton, Senior Lecturer in Epigenetic Epidemiology at Newcastle University, who led the work said: "We were looking at what are known as “epigenetic patterns”, the chemical signals that turn “on” or “off” certain genes. In this research we found a link between those found at birth and a child’s weight when they were nine.

"This suggests that our [DNA](#) could be marked before birth and these marks could predict our later body weight."

Epigenetics is a rapidly emerging and exciting area of scientific research which may help to explain how the environment and genome work together to influence our risk of many diseases. Evidence is growing that factors like diet, exercise, smoking and hormones can alter the regulation of our genome – when genes are switched on and when they are switched off – even before birth.

There is growing scientific evidence to show that certain negative factors during the baby's development in the womb, such as a poor diet, whether or not the mother smoked or was stressed, predispose children to obesity and other health problems. Epigenetics is a mechanism that might explain how this comes about because epigenetic markings can be influenced by our environment and behaviours. The findings from this study support this idea.

This research identified genes that showed different epigenetic patterns in children who were overweight or obese compared to children of normal weight. The patterns known as DNA methylation (a methyl is a small molecule that attaches itself to DNA and which can switch a gene on or off) were analysed in these genes in DNA samples from children collected at birth to assess whether there was any evidence that these genes are somehow different well before childhood body weight is developed.

The researchers used data from the Bristol-based Children of the 90s study and a Newcastle-based study of premature [children](#) whose health has been followed into childhood.

Professor Relton added: "While we have discovered an association between these genes and body size in childhood we need to carry out

further studies to establish whether influencing the expression of these genes by altering epigenetic patterns is indeed a trigger to obesity."

More information: DNA methylation patterns in cord blood DNA and body size in childhood, Caroline L Relton, Alexandra Groom, Beate St Pourcain, Adrian E Sayers, Daniel C Swan, Nicholas D Embleton, Mark S Pearce, Susan M Ring, Kate Northstone, Jon H Tobias, Joseph Trakalo, Andy R Ness, Seif O Shaheen, George Davey Smith, published in *PLoS ONE*, Wednesday 14 March 2012.

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