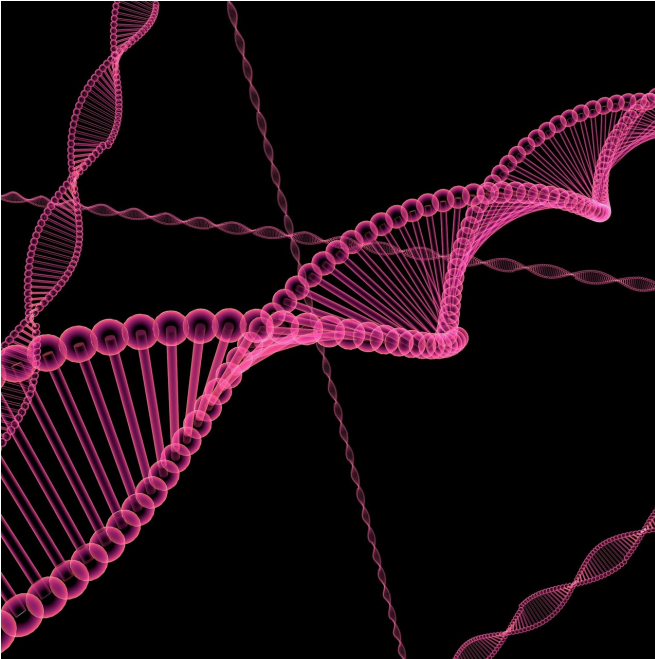


Child's risk of obesity influenced by changes in genes

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A child's risk of obesity as they grow up can be influenced by modifications to their DNA prior to birth, a new University of Southampton study has shown.

These changes, known as epigenetic modifications, control the activity of our genes without changing the actual DNA sequence. One of the main [epigenetic modifications](#) is DNA methylation, which plays a key role in the development of the embryo and the formation of different cell types, regulating when and where genes are switched on.

DNA methylation can be affected by a range of environmental factors such as parental health, diet and lifestyle.

Researchers from the University of Southampton,

as part of the EpiGen Global Consortium, analysed the levels of DNA methylation at the SLC6A4 gene which is an important mediator in serotonin levels in the body and has been implicated in mood and appetite regulation.

The samples taken were umbilical cord tissue of babies born in the Southampton Women's Survey at [birth](#) and compared with the amount of fat tissue in the child at four and six years of age.

They found that lower DNA methylation levels at the SLC6A4 gene at birth was associated with a higher fat mass at six to seven years of age. Each unit lower SLC6A4 methylation at birth was associated with a seven per cent higher child's fat mass at age six years.

The Southampton team compared the results to the mother's health during [pregnancy](#) and found that higher weight gain during pregnancy and a lower number of previous births was associated with lower SLC6A4 DNA methylation.

Co-lead author Karen Lillycrop, from the University of Southampton, said: "Our results add to the growing evidence that epigenetic changes detectable at birth are linked to a child's health as they grow up. Additionally, it also strengthens the body of evidence that shows a mother's health during pregnancy can affect the future health of her child. It could allow us to more accurately predict the future risk of [obesity](#)."

The results, published in the *International Journal of Obesity* were replicated in other groups of children and adults, notably the Western Australian Pregnancy Cohort Study and the UK BIOCLAIMS cohort.

This latest Southampton study is another example of how the health of parents before and during pregnancy can affect the health of their future baby.

Emma Garratt, co-lead author, from the University of Southampton, said: "These results offer more evidence and more opportunity to allow us to develop strategies and interventions in early life that could reduce childhood obesity rates."

Professor Keith Godfrey, a member of the research team and Director of the EpiGen Global Consortium, added: "The new findings strengthen the case that primary prevention of childhood obesity needs to begin before birth, and might 'reset' appetite levels in ways that protect infants and children from putting on excessive weight."

"Ongoing research is examining whether diet and lifestyle interventions before and during pregnancy might be able to tackle and even reverse the childhood obesity epidemic."

Provided by University of Southampton

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