

# Age of puberty in girls influenced by which parent their genes are inherited from

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(Boston)—The age at which girls reach sexual maturity is influenced by 'imprinted' genes, a small sub-set of genes whose activity differs depending on which parent passes on that gene, according to new research published today in the journal *Nature*.

The findings come from an international study of more than 180,000 women involving scientists from 166 institutions worldwide, including Boston University School of Medicine. The researchers identified 123 genetic variations that were associated with the timing of when girls experienced their first menstrual cycle by analysing the DNA of 182,416 women of European descent from 57 studies. Six of these variants were found to be clustered within imprinted regions of the genome.

The activity of imprinted [genes](#) differs depending on which parent the gene is inherited from – some genes are only active when inherited from the mother, others are only active when inherited from the father. Both types of [imprinted genes](#) were identified as determining puberty timing in girls, indicating a possible biological conflict between the parents over their child's rate of development. Further evidence for the parental imbalance in inheritance patterns was obtained by analysing the association between these imprinted genes and timing of puberty in a study of over 35,000 women in Iceland, for whom detailed information on their family trees were available.

This is the first time that it has been shown that imprinted genes can control rate of development after birth.

Senior author Joanne Murabito, MD, ScM, associate professor of medicine at Boston University School of Medicine /Framingham Heart Study says: "Our findings demonstrate a complex network of [genetic factors](#) underlying the timing of menarche. Menarche is associated with the development of health conditions later in life in women such as diabetes, cardiovascular disease, and breast cancer. By studying genetic factors we hope to better understand how puberty timing in girls is linked to important health conditions in women."

**More information:** Perry, JRB et al. Parent-of-origin specific allelic associations among 106 genomic loci for age at menarche. *Nature*; 23 July 2014. [DOI: 10.1038/nature13545](https://doi.org/10.1038/nature13545)

Provided by Boston University Medical Center

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