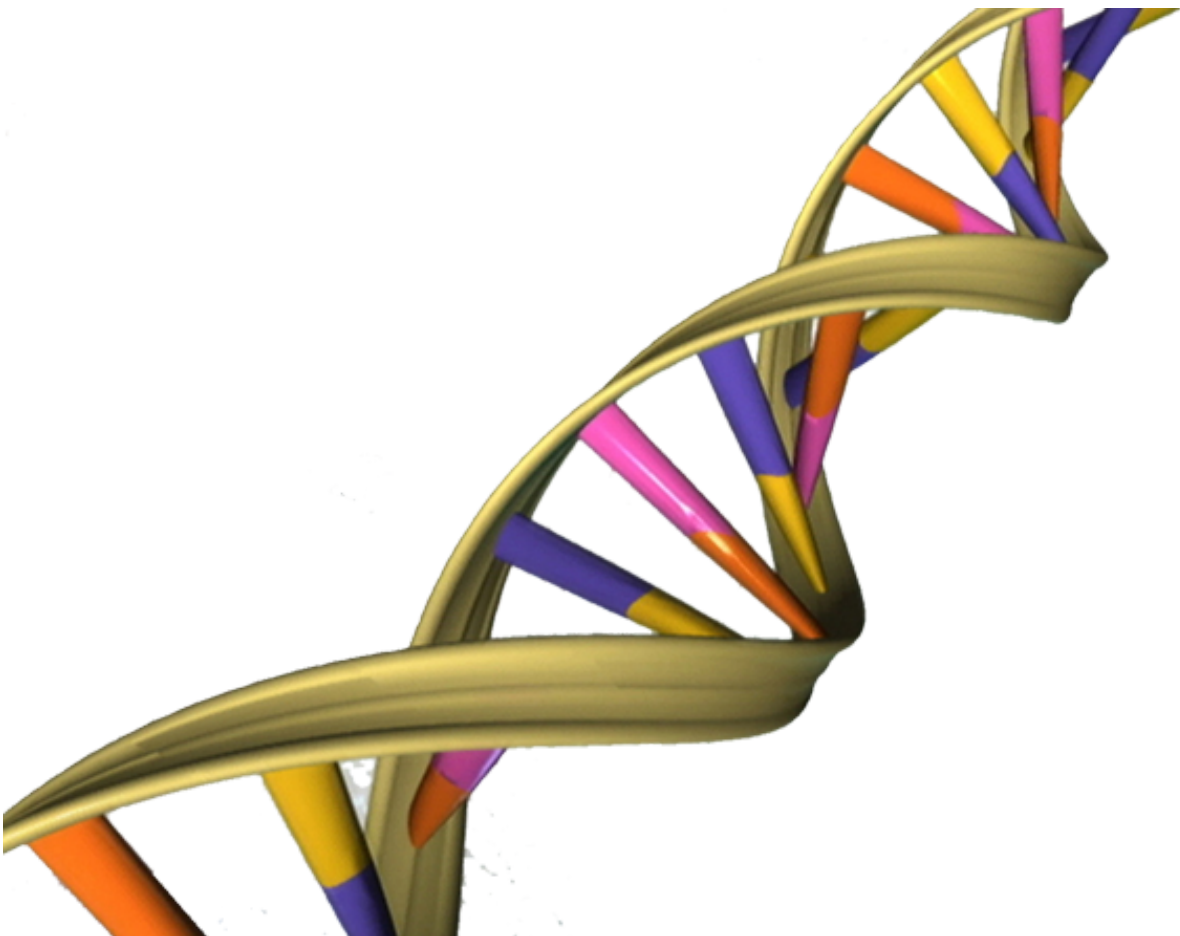


New study reveals strong genetic correlation between male and female puberty timing

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A depiction of the double helical structure of DNA. Its four coding units (A, T, C, G) are color-coded in pink, orange, purple and yellow. Credit: NHGRI

In the largest genomic analysis of puberty timing in men, new research conducted by scientists at the University of Cambridge and 23andMe shows that the timing of puberty in males and females is influenced by many of the same-shared genetic factors. The study results are the first to quantify the strongly shared genetic basis for puberty timing between the sexes.

Published this week in *Nature Communications*, the study is the largest genomic analysis of puberty to look at both men and women. Previous work had identified 106 genetic variants that alter puberty timing in females, and the current study shows that those same genetic factors have very similar effects on male puberty timing. The study looked at genetic information of more than 55,000 male 23andMe customers who consented to participate in research. Following this first analysis, the collected data was compared to existing data from more than 250,000 women. The study focused on the genetic regions that influence age at voice breaking - a distinct developmental milestone that happens to young men as their larynx (voice box) lengthens when exposed to male hormones.

"Our study shows that although there are obvious physical differences in pubertal development between boys and girls, many of the underlying biological processes governing it are the same. It also shows that the age when men's voices break, even when recalled decades after the event, is an informative measure of puberty timing," says co-author Dr. Felix Day from the MRC Epidemiology Unit at the University of Cambridge.

"Until now, most of our understanding of the biological regulation of puberty timing has come from large studies of healthy women, in whom the stages of puberty are usually easier to remember, or studies of patients affected by rare disorders. Research has been scarce in men, largely because investigators have disregarded the accuracy that men can recall pubertal events," explains study lead Dr. John Perry (also from the

MRC Epidemiology Unit at the University of Cambridge).

In addition, the study finds five new genetic variants associated with puberty timing, some acting through known hormone pathways, others through previously overlooked hormone pathways.

One of the main aims of this study was to look at the relevance of male puberty timing in impacting health and the development of diseases. The study found that many of the genes involved in puberty timing were also shared with diseases that appear later in life. For most diseases, earlier puberty appeared genetically linked to poorer health outcomes.

Co-lead Dr. Ken Ong (also from the MRC Epidemiology Unit at the University of Cambridge) concludes, "There was already good evidence in women that earlier puberty timing leads to higher risks for health outcomes later in life such as Type 2 diabetes, obesity and cardiovascular disease. We now show that the same is true in men. The next steps will be to understand how to prevent early puberty in boys and girls, possibly by reducing childhood overweight and obesity, or by other means."

More information: Felix R. Day et al. Shared genetic aetiology of puberty timing between sexes and with health-related outcomes, *Nature Communications* (2015). [DOI: 10.1038/ncomms9842](https://doi.org/10.1038/ncomms9842)

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