

New Insight into Girl Genes

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An international genetics study by Perth scientists has uncovered links between a specific gene (28Linb) and the onset of menstruation (menarche) in females.

The study has given scientists a better understanding of reproductive diseases such as ovarian cancer and breast cancer amongst women.

The study published in [Nature Genetics](#), an online peer-reviewed journal, was aimed at identifying the specific genes that initiated menarche, and the start of the menstruation cycle in females.

Menarche is the first menstrual period young women experience and occurs, on average, at 13 years of age, which is normally two years after the onset of puberty.

University of WA molecular geneticist Adjunct Associate Professor Scott Wilson co-authored the study and said puberty in a human's life is an important part of our biology which needs more research.

"The onset of puberty in boys and girls is a fundamental biological mystery," he said.

"Although there have been quite a few genetic studies over the years, nothing conclusive has come out of those studies."

Throughout the research process, Prof Wilson has had a role in data collection, study design, interpretation of the data, and finally the write-up.

The study of 17,510 women included eight sub-studies, conducted across five countries over 16 years, by 15 scientists, including Prof Wilson. All women were grouped in accordance with the age they began their menstruation cycle, and with the use of high-tech '[gene chips](#)' researchers analysed DNA samples from the groups to identify and highlight similar gene codes among women that could be accountable for menarche. Gene chips are microchips that hold DNA from each human gene and allow a large number of genetic tests to be done on one DNA sample at the same time.

Prof Wilson said that gene chips have only been available in the last three years, and that their development made it possible "to access this genetic technology and put together all these studies nicely."

He added: "We largely looked at the subtle changes in the gene's function which create a spectrum of traits that we see through various human characteristics."

There are environmental and genetic factors that determine the age of menarche. Until now, scientists have had limited knowledge about the genes that affect menarche.

"There's evidence that the age of menarche has been declining over the last two decades because of

improved nutrition, so we knew nutrition had a pretty big role,” he said.

“About 50 to 60 per cent of the trait is controlled by genes, and we really knew nothing about the genes that control it. So this study was principally designed to try and identify some of those genes.”

Scientists found one gene known as 28Linb to be very common amongst all DNA samples analysed, and played a role in the age of menarche. Lin28b has previously been associated with height in adults, and by regularly surfacing in tests; scientists concluded that the gene was a predictor for menarche. They found height gain in childhood precedes menarche, which in turn slows growth; so early developers are seen to be taller as girls but shorter as women.

Previous studies have also suggested weight relates to the age of menarche. Like height, weight gain precedes menarche, and so heavier girls are believed to mature earlier.

Prof Wilson believes that with the results of these studies, scientists are now better equipped to engineer therapeutic goods for women with reproductive organ diseases.

“The study contributes to an improved understanding of the processes involved in the onset of menstruation,” he said. “In addition, knowledge about the mechanisms controlling this aspect of reproductive biology may also help inform us about disease of the reproductive system.

** Perry JR, et al. Meta-analysis of genome-wide association data identifies two loci influencing age at menarche. Nat Genet. 2009 Jun;41(6):648-50.*