

New insight into placental growth and healthy pregnancy

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Scientists at the Babraham Institute have gained a new understanding of how the growth of the placenta is regulated before birth, which has important implications for a healthy pregnancy. The research, published today (10 June) in the journal *Nature Cell Biology* shows that the controlled release of a specific molecule, called miR-675, slows down growth of the placenta before birth.

RNA molecules are best known as the intermediary between the cell's DNA and the making of proteins necessary for cell function. However, there are also many RNA molecules with functions other than encoding proteins. Babraham Institute scientists are involved in researching the role of these noncoding RNAs, including microRNAs (a type of short noncoding RNA molecule) which are important for regulating cell development and function.

The noncoding RNA H19 is one of the most abundant [RNA molecules](#) found in [mammals](#) but until now its function was unknown. This study, in collaboration with academics in France, the USA and Belgium, is the first to show that a [microRNA](#) called miR-675 is 'cut out' and released from the longer H19 RNA in the placenta and that this limits placental growth.

Dr Andrew Keniry from the Babraham Institute who is lead author explained, "The function of the H19 noncoding RNA has proven elusive for many years. We have shown that it appears to act as an inert molecule used to store the functional miR-675 until it is required by the

cell to slow placental growth. This is a very exciting finding and reveals a new purpose for noncoding RNA. It is also intriguing that the release of miR-675 is controlled by a stress-response protein, suggesting this may be a mechanism the developing embryo can use to regulate its growth in the [womb](#)."

Professor Wolf Reik, senior author of the paper and a Group Leader at the Babraham Institute, which receives strategic funding from the Biotechnology and Biological Sciences Research Council (BBSRC) said, "It's interesting to see how the growth of the placenta can be regulated in this flexible way before birth. Perhaps there are environmental signals and influences from the mother's diet on the growth of the [placenta](#) and hence the healthy baby. It's also fascinating how an RNA that is so abundant in the cell can be a quick-release reservoir of a growth regulating small RNA, and this may be generally important for how cell [growth](#) is regulated by the environment."

Provided by Biotechnology and Biological Sciences Research Council

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