

# Imprinted genes in the 'parenting hub' of the brain determine if mice are good parents, new study finds

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Whether a mouse is a good or bad parent can be traced back to imprinted genes in key neurons in the "parenting hub" in the brain,

according to a new study by Anthony Isles of Cardiff University and colleagues, published October 19 in the journal *PLOS Genetics*.

In mice, there is some evidence that an unusual phenomenon in mammals called genomic imprinting impacts parenting behavior. Mammals inherit two copies of each gene—one from each parent—and usually, each copy is expressed equally in the cell. With imprinted genes, however, only one copy is expressed, either the one inherited from the father or the mother.

To confirm that imprinted genes play a role in parenting, Isles' team used sequencing data from neurons in the parenting hub in the hypothalamus of mice. They found that [imprinted genes](#) are especially common among the genes expressed in these cells, including *Magel2*, a novel imprinted gene that was not previously linked to parenting. Further experiments showed that mice lacking an active form of *Magel2* were inattentive parents that made subpar nests.

The new findings show that genomic imprinting plays an important role in controlling parenting behavior in mice. Interestingly, previous research has shown that if [mouse](#) pups lose the paternal version of *Magel2*, they make fewer ultrasonic vocalizations, which they use to get their mother's attention. Together, these results support the idea that genomic imprinting has evolved to coordinate parenting activities between a mother and her pups.

The authors add, "Our study demonstrates the importance of imprinted [genes](#) as a group in [neural circuitry](#) that controls parenting behavior in mammals. These findings imply that the maternal and paternal genomes may differentially manipulate [parental care](#) for their own ends, and thus shaping the evolution of parenting behavior in mammals."

**More information:** The parenting hub of the hypothalamus is a focus

of imprinted gene action, *PLOS Genetics* (2023). [DOI: 10.1371/journal.pgen.1010961](https://doi.org/10.1371/journal.pgen.1010961)

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