

Study shows our epigenetics change rapidly in first year of life

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(Medical Xpress)—The way our genes are activated changes rapidly when we are infants, a new study of twins at the Murdoch Childrens Research Institute has found.

Researchers studied the epigenetic 'switches' that regulate [gene activity](#) in 15 sets of twins at birth and at 18 months of age. The study, which is published in *Genome Biology*, found widespread epigenetic change in the [genome](#) within the first 18 months of life.

Epigenetic gene switches help to direct development and ageing but can also be influenced by the environment, particularly in early life.

Focusing on DNA from cheek cells, researchers found that one third of the locations they looked at had changed their epigenetic state between birth and 18 months of age, with the regions furthest from [genes](#) changing the most.

Researchers say this supports the idea that our genomes are most susceptible to the environment in the first 1000 days of life.

Researchers also found twins can become more epigenetically different with age, but unexpectedly that some twins can become more epigenetically similar. Researchers say this may be because some twins have very different environments in the [womb](#), but very similar environments after birth.

"It is important to know how fast these switches change during [early childhood](#) to help us to work out the extent in which early environments can change our genes and how one day we may be able to change them back," said one of the lead researchers, Dr Jeff Craig.

"Other studies have suggested that as twin's age, their epigenetic switches become more different. We found that this is the case for some twins, but surprisingly, other twins can end up more similar in their [epigenetics](#) at 18 months."

"Our results show that our genes are changing rapidly when we are infants. They also confirm our previous finding that genetically [identical twins](#) may be epigenetically different at birth and that there may be some flexibility about how we develop in early childhood."

The researchers' next focus will be on specific diet and lifestyle factors of mums and babies that may have the capacity to change their epigenetics and possibly influence future health.

Provided by Murdoch Childrens Research Institute

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