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# 'Memories' pass between generations

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**By James Gallagher**

Health and science reporter, BBC News

## **Behaviour can be affected by events in previous generations which have been passed on through a form of genetic memory, animal studies suggest.**

Experiments showed that a traumatic event could affect the DNA in sperm and alter the brains and behaviour of subsequent generations.

**A Nature Neuroscience study** shows mice trained to avoid a smell passed their aversion on to their "grandchildren".

Experts said the results were important for phobia and anxiety research.

The animals were trained to fear a smell similar to cherry blossom.

The team at the Emory University School of Medicine, in the US, then looked at what was happening inside the sperm.

They showed a section of DNA responsible for sensitivity to the cherry blossom scent was made more active in the mice's sperm.

Both the mice's offspring, and their offspring, were "extremely sensitive" to cherry blossom and would avoid the scent, despite never having experienced it in their lives.

Changes in brain structure were also found.

"The experiences of a parent, even before conceiving, markedly influence both structure and function in the nervous system of subsequent generations," the report concluded.

## **Family affair**

The findings provide evidence of "transgenerational epigenetic inheritance" - that the environment can affect an individual's genetics, which can in turn be passed on.

One of the researchers Dr Brian Dias told the BBC: "This might be one mechanism that descendants show imprints of their ancestor.

"There is absolutely no doubt that what happens to the sperm and egg will affect subsequent generations."

Prof Marcus Pembrey, from University College London, said the findings were "highly relevant to phobias, anxiety and post-traumatic stress disorders" and provided "compelling evidence" that a form of memory could be passed

between generations.

He commented: "It is high time public health researchers took human transgenerational responses seriously.

"I suspect we will not understand the rise in neuropsychiatric disorders or obesity, diabetes and metabolic disruptions generally without taking a multigenerational approach."

In the smell-aversion study, is it thought that either some of the odour ends up in the bloodstream which affected sperm production or that a signal from the brain was sent to the sperm to alter DNA.

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