

## Scientists have found that memories might be passed down through generations in our DNA



MAY 30, 2014

New research from Emory University School of Medicine, in Atlanta, has shown that it is possible for some information to be inherited biologically through chemical changes that occur in DNA. During the tests they learned that mice can pass on learned information about traumatic or stressful experiences – in this case a fear of the smell of cherry blossom – to subsequent generations.

According to the Telegraph, Dr Brian Dias, from the department of psychiatry at Emory University, said: "From a translational perspective, our results allow us to appreciate how the experiences of a parent, before even conceiving offspring, markedly influence both structure and function in the nervous system of subsequent generations.

"Such a phenomenon may contribute to the etiology and potential intergenerational transmission of risk for neuropsychiatric disorders such as phobias, anxiety and post-traumatic stress disorder."

This suggests that experiences are somehow transferred from the brain into the genome, allowing them to be passed on to later generations.

The researchers now hope to carry out further work to understand how the information comes to be stored on the DNA in the first place.

They also want to explore whether similar effects can be seen in the genes of humans.

Professor Marcus Pembrey, a paediatric geneticist at University College London, said the work provided "compelling evidence" for the biological transmission of memory.

He added: "It addresses constitutional fearfulness that is highly relevant to phobias, anxiety and post-traumatic stress disorders, plus the controversial subject of transmission of the 'memory' of ancestral experience down the generations.

"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."

Professor Wolf Reik, head of epigenetics at the Babraham Institute in Cambridge, said, however, further work was needed before such results could be applied to humans.

He said: "These types of results are encouraging as they suggest that transgenerational inheritance exists and is mediated by epigenetics, but more careful mechanistic study of animal models is needed before extrapolating such findings to humans."

<http://earthweareone.com/scientists-have-found-that-memories-may-be-passed-down-through-generations-in-our-dna/>

Parental olfactory experience influences behavior and neural structure in subsequent generations

Brian G Dias & Kerry J Ressler

Nature Neuroscience 17, 89–96 (2014) doi:10.1038/nn.3594

Using olfactory molecular specificity, we examined the inheritance of parental traumatic exposure, a phenomenon that has been frequently observed, but not understood. We subjected F0 mice to odor fear conditioning before conception and found that subsequently conceived F1 and F2 generations had an increased behavioral sensitivity to the F0-conditioned odor, but not to other odors. When an odor (acetophenone) that activates a known odorant receptor (Olfr151) was used to condition F0 mice, the behavioral sensitivity of the F1 and F2 generations to acetophenone was complemented by an enhanced neuroanatomical representation of the Olfr151 pathway. Bisulfite sequencing of sperm DNA from conditioned F0 males and F1 naive offspring revealed CpG hypomethylation in the Olfr151 gene. In addition, *in vitro* fertilization, F2 inheritance and cross-fostering revealed that these transgenerational effects are inherited via parental gametes. Our findings provide a framework for addressing how environmental information may be inherited transgenerationally at behavioral, neuroanatomical and epigenetic levels.

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