Medical Xpress

Epigenetic markers associated with Alzheimer's disease found

August 29 2019, by Bob Yirka

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A team of researchers from the Brigham and Women's Hospital, Harvard Medical School and the Dana-Farber Cancer Institute in the U.S., and Shanghai Medical College of Fudan University in China, has found epigenetic markers associated with Alzheimer's disease (AD). In their paper published in the journal *Science Advances*, the group describes studying methylation in skin cultures from patients with and

without AD, and what they found.

Despite many years of effort and countless dollars spent, scientists have been unable to cure AD, the most common form of dementia—but they have learned a lot more about it. Prior research has shown that it is not a heritable disease, but researchers suspect that epigenetics might play a role. To find out if that might be the case, the researchers put together a study focused on DNA methylation, the process whereby a methyl group is added to a DNA nucleotide. The changes that occur do not alter the DNA itself, but instead alter gene expression.

To learn more about the process and to find out if problems with methylation might be linked to AD, the researchers collected pluripotent skin stem cells from volunteers, some of whom had AD and others who did not. The team then induced the stem cells to grow into nerve cells and watched the process for changes to DNA methylation that they could use for comparison purposes.

The researchers report that testing the modifications they found and comparing them with data from a large clinical trial revealed 27 regions of the genome where epigenetic changes occurred. They further report that the signatures were AD-specific and were not correlated with age. They also found what they describe as "hints" that the signatures they found could lead to a way to identify the disease in patients at a much younger age, allowing for treatment to delay onset. They conclude by noting that they found evidence suggesting that regulation, establishment and maintenance of the epigenetic signatures likely play a role in the progression of AD—they do acknowledge, however, that more work is required to confirm their suspicions.

More information: Irfete S. Fetahu et al. Epigenetic signatures of methylated DNA cytosine in Alzheimer's disease, *Science Advances* (2019). DOI: 10.1126/sciadv.aaw2880

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Citation: Epigenetic markers associated with Alzheimer's disease found (2019, August 29) retrieved 21 September 2024 from
https://medicalxpress.com/news/2019-08-epigenetic-markers-alzheimer-disease.html

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