The "Anti-aging" Enzyme Reversing Cognitive Decline

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Key Points

- ***"Anti-aging molecule":***
- ***HDAC1 found to be correlated with DNA repair.***
- ***Successful results have been seen in curing Alzheimer's while targeting HDAC1.***

DNA damage is fairly common in our cells and can prove to be lethal.[1] Fortunately, our bodies are well adapted and capable of rectifying these, especially when we are young. Unfortunately, as the person ages, this physiological mechanism of body does not remain very efficient.[2]

A recent study, conducted by researchers at MIT, discovered that revitalizing HDAC1 boosts DNA repair in neurons, relieving symptoms of Alzheimer's patients and of other cognitive decline diseases.[3] While previous studies have monitored the enzyme HDAC1 and investigated its function, the aforementioned study distinguishes itself by observing the effects of inhibiting the enzyme.

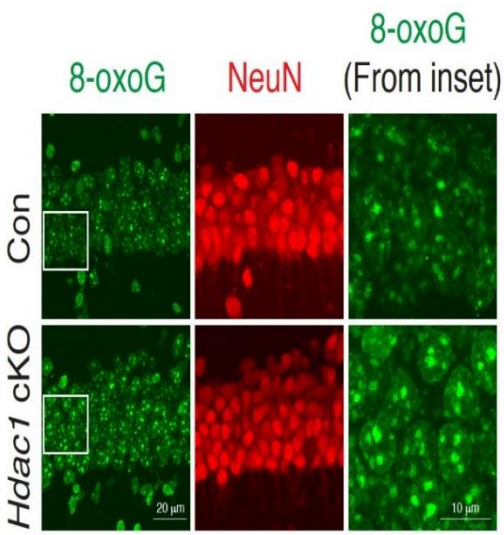

Figure 1: The effect of eliminating HDAC1 (bottom row) results in higher levels of DNA damage (green dots).[3] *(Source: Nature)*

Mice lacking HDAC1 were produced and were compared to mice with the enzyme. While no significant difference was seen in their youth but the with the age the decline in DNA repair became more significant.

The mice without the HDAC1 had larger amounts of DNA damage in their neurons with age, this led to diminished synaptic plasticity, resulting in poor performances during memory and spatial navigation tests.

Further investigation revealed that the mice had 8-oxo-guanine lesions, a particular type of DNA damage caused by oxidation. It is worth noting that Alzheimer's patients exhibit a similar pattern.

Senior author of the study, Li-Huei Tsai said, "It seems that HDAC1 is really an anti-aging molecule". "I think this is often a really broadly applicable basic biology finding, because nearly all of the human neurodegenerative diseases only happen during aging. I would speculate that activating HDAC1 is useful in many conditions."

Interestingly, using exifone on mice with Alzheimer's and healthy old mice led to reduction in DNA damage to the brain and improved cognitive functions like memory, for both populations. Exifone is an old dementia drug and it revitalizes HDAC1.

"This study really positions HDAC1 as a possible new drug target for age-related phenotypes, also as neurodegeneration-associated pathology and phenotypes," says Tsai.

References

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