Can estrogen use improve memory, brain aging? Tulane researcher seeks answers

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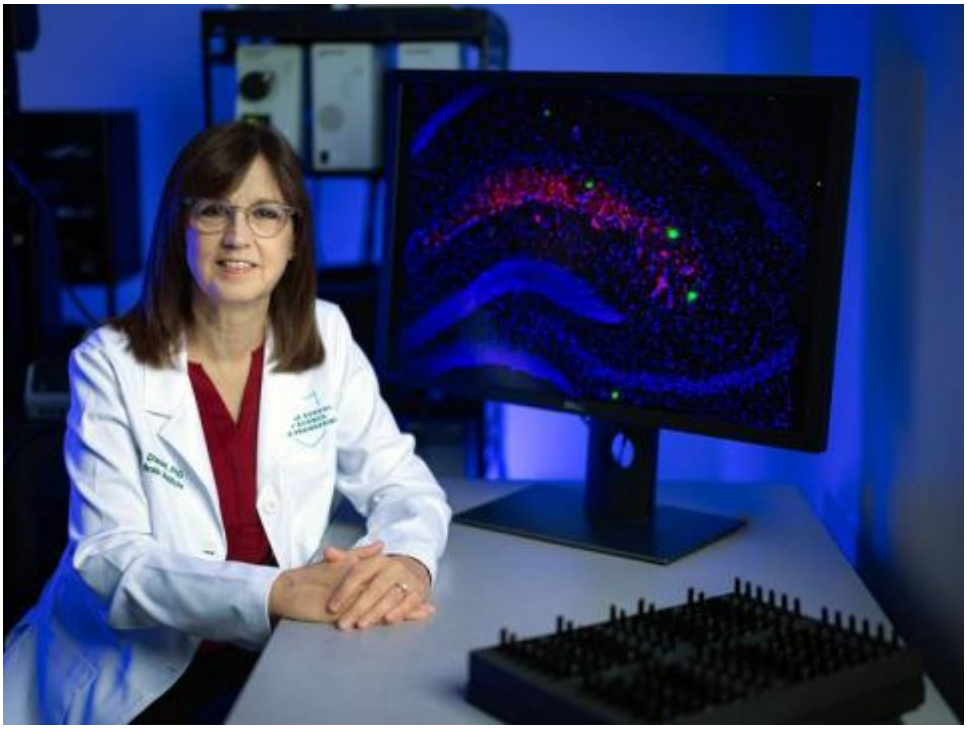

Jill Daniel, PhD, the Gary P. Dohanich Professor of Brain Science at Tulane University School of Science and Engineering, is investigating whether short-term estrogen use in middle age may lead to better brain aging and memory. (Photo by Rusty Costanza)

A Tulane University researcher has been awarded a $2.69 million grant from the National Institute on Aging of the National Institutes of Health to study how short-

term hormone therapy at the beginning of menopause may affect later cognitive aging in women.

Jill Daniel, PhD, the Gary P. Dohanich Professor of Brain Science at Tulane University School of Science and Engineering, has been investigating whether estrogen produced by brain cells can help women overcome cognitive deficits as they age. Her team uses rodent models to examine the long-term effects of short-term estrogen use during middle age.

"We found that if we give these rodents the equivalent of three to five years of estrogen, we see long-term lasting impacts on memory and brain aging," said Daniel, a psychology professor and member of the Tulane Brain Institute.

Her research suggests that short-term estrogen use in middle age may lead to better brain aging and memory long after treatment stops. The hippocampus, a brain area critical for memory formation and particularly vulnerable to aging, is a key focus of the study.

Daniel's team is investigating "neuroestrogens," estrogen produced by brain cells. Preliminary data indicate that short-term estrogen use in middle age may alter the trajectory of neuroestrogen production, potentially maintaining higher levels throughout aging.

"We hypothesize that the neuroestrogens can compensate for the loss of ovarian estrogens," Daniel explained. "If we can keep those levels of neuroestrogens up throughout aging, then that would be a critical factor in brain aging."

The research compares brain aging in mice with no estrogen, continuous estrogen, and short-term estrogen exposure. Initial findings suggest that short-term estrogen use may provide similar benefits to long-term use for brain health, without the potential risks associated with extended hormone therapy.

Daniel's work could have implications for menopausal hormone therapy in women. Current recommendations suggest limited use of estrogen during the menopausal transition, but the long-term effects on brain health are unclear.

The study builds on evolving understanding of hormone therapy since the Women's Health Initiative in the early 2000s, which initially raised concerns about estrogen use but has since been reassessed.

Daniel's broader research aims to understand how estrogens and androgens impact areas of the brain important for cognition across the lifespan.