

Brain changes after menopause may lead to lack of physical activity

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As women enter menopause, their levels of physical activity decrease; for years scientists were unable to determine why. Now, researchers from the University of Missouri have found a connection between lack of ovarian hormones and changes in the brain's pleasure center, a hotspot in the brain that processes and reinforces messages related to reward, pleasure, activity and motivation for physical exercise. Findings suggest that activation of brain receptors in that part of the brain may serve as a future treatment to improve motivation for physical activity in postmenopausal women.

"Postmenopausal women are more susceptible to weight gain and health issues," said Victoria Vieira-Potter, assistant professor of nutrition and exercise physiology at MU. "This is especially frustrating for women, who already are dealing with significant changes to their bodies. We found that the decrease in [physical activity](#) that leads to weight gain may be caused by changes in [brain](#) activity."

Vieira-Potter and her research team compared the physical activity of rats that were highly fit to rats that had lower fitness levels. The team studied the rats' use of running wheels set up in the cages before and after the rats had their ovaries removed. They also examined [gene expression changes](#) of dopamine receptors within the brain's pleasure center.

The high-fit rat group had more activity in the brain's pleasure center, which correlated with greater wheel running before and after the loss of

ovarian hormones. However, the high-fit rats still saw a significant reduction in wheel running after their ovaries were removed. This reduction in wheel running also correlated significantly with a reduction in their dopamine signaling levels, indicating that the brain's [pleasure center](#) could be involved.

"We found that in both groups of rats, the hormonal changes from menopause led to changes in the brain that translated to less physical activity," Vieira-Potter said. "The findings confirm previous evidence in humans and rodents that weight gain that occurs after menopause is likely due to decreased overall physical activity rather than increased energy intake from diet. Understanding what is causing the decrease in activity and subsequent weight gain may allow us to intervene, possibly by activating [dopamine receptors](#), to preserve the motivation to be physically active."

Provided by University of Missouri-Columbia

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