

# Exercise may fight depression in older adults, study suggests

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Combining aerobic and resistance training may offer the most benefits for women during and after chemotherapy for breast cancer, according to a new U of A study. The research also showed that women who included resistance training in their workouts were more likely to stick with regular exercise after their cancer treatment.. Credit: CC0 Public Domain

New research suggests that exercise-induced muscle changes could help boost mood in older adults. The study is published ahead of print in the *American Journal of Physiology—Cell Physiology*.

Exercise increases the expression of certain proteins ([transcription factors](#)) that help regulate [gene expression](#) and the processing (metabolism) of tryptophan in the body. Tryptophan is a mood-enhancing chemical closely related to serotonin, a substance that also affects mood. Many people with depression have been found to have low levels of serotonin in the blood. Tryptophan metabolism happens almost completely through the kynurenine pathway, a "metabolic route" that has two branches: one that can protect brain tissue (neuroprotective) and one that can cause harm (neurotoxic).

The neuroprotective branch of the kynurenine pathway needs an enzyme called KAT to be able to function. Aerobic and [resistance exercise](#) have been found to increase KAT activity, thereby promoting tryptophan metabolism via the neuroprotective branch instead of the neurotoxic branch. Preliminary research in [younger adults](#) has suggested that physical activity-related changes in the muscles may play a role in this mood-boosting effect of exercise. However, not as much is known about these changes—and their potential as an alternative treatment for depression—in [older adults](#).

Researchers from McMaster University in Ontario, Canada, studied a small group of healthy older men without history of depression. The men, who were 65 or older, participated in a 12-week exercise trial consisting of resistance exercise (leg and shoulder presses) and high-intensity interval training on a stationary bicycle. The research team took blood and muscle samples and examined gene and [protein expression](#) in the muscles before, during and after the trial. They found that expression of transcription factors and KAT increased significantly during the exercise trial. These results were consistent with previous research

performed in younger adults.

"The significant exercise training-induced increase in the expression of skeletal muscle transcription factors and KAT in older adults is encouraging given the potential implications related to kynurenine pathway regulation. Future studies are warranted to explore the impact of various exercise modalities and intensities on transient changes of such factors in depressed adults," the researchers wrote.

**More information:** David J. Allison et al, Exercise training impacts skeletal muscle gene expression related to the kynurenine pathway, *American Journal of Physiology-Cell Physiology* (2019). [DOI: 10.1152/ajpcell.00448.2018](https://doi.org/10.1152/ajpcell.00448.2018)

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