

Research shows certain genes, in healthy environments, can lengthen lifespan

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Credit: University at Buffalo

Researchers at the University at Buffalo Research Institute on Addictions have discovered how a gene in the brain's dopamine system can play an important role in prolonging lifespan: it must be coupled with a healthy environment that includes exercise.

The study, led by Panayotis (Peter) K. Thanos, senior research scientist at RIA, appears in the current, online version of *Oncotarget Aging*, a top-ranked aging journal.

Thanos and his team studied the genes in [dopamine](#) to assess their impact on lifespan and behavior in mice. Dopamine is a neurotransmitter that helps control the brain's reward and pleasure centers and helps regulate physical mobility and emotional response.

The researchers found that the dopamine D2 receptor gene (D2R) significantly influences lifespan, body weight and locomotor activity, but only when combined with an enriched environment that included [social interaction](#), sensory and cognitive stimulation and, most critically, exercise.

"The incorporation of exercise is an important component of an enriched environment and its benefits have been shown to be a powerful mediator of brain function and behavior," Thanos says.

The mice in the enriched environment lived anywhere from 16 to 22 percent longer than those in a deprived environment, depending on the level of D2R expression.

"These results provide the first evidence of D2R gene-environment interaction playing an important role in longevity and aging," Thanos says. "The dichotomy over genes versus environment has provided a rigorous and long debate in deciphering individual differences in longevity. In truth, there exists a complex interaction between the two which contribute to the differences."

Research exploring this genetic-environmental interaction should lead to a better understanding and prediction of the potential benefits of specific environments, such as those including exercise, on longevity and health during aging.

Provided by University at Buffalo

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