Living longer and happier

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A new study from the University of Missouri may shed light on how to increase the level and quality of activity in the elderly. In the study, published in this week's edition of *Public Library of Science - ONE*, MU researchers found that gene therapy with a proven "longevity" gene energized mice during exercise, and might be applicable to humans in the future.

"Aging is one of the biggest challenges to a modern society. A pressing issue in the elderly is the loss of activity. What one really wants is not a simple lifespan prolongation but rather a health span increase," said Dongsheng Duan, an associate professor of molecular microbiology and immunology. "After gene therapy with a 'longevity' gene, we studied how well the mice performed on treadmill exercises. We found that the gene therapy worked well and the mice functioned better after the treatment."

Earlier studies have found that mice would live longer when their genome was altered to carry a gene known as mitochondria-targeted catalase gene, or MCAT. However, such approaches would not be applicable to human. Duan and Dejia Li, a post-doctoral researcher working with Duan, took a different approach and placed the MCAT gene inside a benign virus and injected the virus into the mice.

Once injected, Duan and Li tested the mice and found that they could run farther, faster and longer than mice of the same age and sex. Duan attributes this performance enhancement to the MCAT and believes the gene is responsible for removing toxic substances, known as free

radicals, from the mitochondria, the powerhouse of the cell. By using this specific gene therapy vector, the virus, to introduce the longevity gene, Duan and Li opened the possibility of human treatment.

"Our results suggest similar therapy may one day improve the life quality of the elderly" Duan said. "This could have important implications for many diseases, such as muscular dystrophy, heart disease, diabetes and neurodegenerative diseases. These patients typically have too many toxic free radicals in their cells."

Source: University of Missouri-Columbia (news : web)

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