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Longer-life gene variant found in UCI study

By PAT BRENNAN
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If you lead an active, extroverted life and are something of a thrill seeker, you might be genetically primed to live into your 90s or longer, according to a new study by a team that included UC Irvine researchers.

A variation of a much-studied gene involved in transmission of dopamine, a key component of the brain's reward and learning system, was found to be far more frequent among the very old.

And the same gene variant was also linked to longer life in mice.

The variant itself might not extend lifespan directly, said Robert Moyzis, a UCI biological chemistry professor and an author of the study.

Instead, it appears to predispose those who bear it to a more vigorous lifestyle.

"This particular variation has already been associated with personality traits that are much more outgoing, much more socially engaged," Moyzis said. "We think it's a simple as that. Obviously, if you are much more likely to be engaged in physical and intellectual activities as you age, there have been many studies that have shown that is a good predictor of adding a few more years to your life."

The human subjects in the study came from Laguna Woods, part of a group involved in the Leisure World Cohort Study that began in 1981. It included people who were 90 years old or older in 2003; most of them have since passed away, Moyzis said.

But their genes, as well as cell lines, live on, perpetuated in laboratories so they will be available for a variety of research projects.

In this study, genetic samples from 310 people 90 years old or older were checked for the gene variant, known as the DRD4 7R allele.

Sixty-six percent more people possessed the gene variant in the 90-plus group when compared with a control group of nearly 3,000, age 7 to 45.

For the mouse component, researchers at Brookhaven National Laboratory found that mice that had the gene variant "knocked out" of their DNA had their lifespans decreased by 7 percent to 9.7 percent compared with mice that carried it.

"Even in a fairly enriched environment, you take out this gene and the mice just don't live very long," Moyzis said.

The gene variant is something of a double-edged sword. While it appears to promote long life, it also has been associated with high-risk behavior, drug addiction and attention deficit hyperactivity disorder, or ADHD – although children with the variant, causing them to be more restless and easily bored in a classroom setting, might not properly belong under the broad umbrella of ADHD, Moyzis said.

Despite the large number of children diagnosed with ADHD shown to have the variant, "they really don't have the cognitive deficits and attention deficits diagnostic for this disorder," he said.

The discovery of the gene variant's association with longevity might inspire people to become more active as they age, potentially extending their lives – even if they don't harbor the variant themselves, Moyzis said.

And more work must be done to learn about potential risks the variant could bring in adolescence, and other traits that might come with it.

"The story isn't totally done," he said. "I get the impression this is the story of all the blind men and the elephant. We have little snippets of what this gene seems to be strongly associated with, but it's hard to say, to totally specify, what the whole pathway is yet."

Contact the writer: 714-796-7865 or pbrennan@ocregister.com.