Group of genes may predict longevity with 77% accuracy

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Courtesy of Boston University Medical Center
and World Science staff

Researchers have identified a group of genes that they say can be used to predict with 77 percent accuracy whether people will live exceptionally long.

The finding is a breakthrough in understanding the role of genes in determining human lifespan, according to the scientists.

They stressed that environment and family history are also factors in healthy aging. Yet the study "shows that genetic data can indeed predict exceptional longevity without knowledge of any other risk factor," wrote the researchers in their report, published July 1 online by the research journal *Science*.

"Further investigation is needed to understand how and why these variants collectively predispose for exceptional longevity," added the investigators, from Boston University Schools of Public Health and Medicine and Boston Medical Center.

The team conducted a genome-wide gene association study in centenarians, who often don't suffer age-related disabilities until well into their mid-nineties. Researchers led by Boston University's Paola Sebastiani and Thomas Perls built a genetic model that includes 150 genetic variants, and which they said could be used to predict whether a person lived to the late 90s or older.

The analysis also identified 19 genetic clusters or "genetic signatures" of exceptional longevity that they said characterized nine in ten centenarians studied. The signatures correlated with differences in the prevalence and age-of-onset of diseases such as dementia and hypertension, and may help identify key subgroups showing healthy aging, the authors said.

The team found that 45 percent of the oldest centenarians – those 110 years and older – had a genetic signature with the highest proportion of longevity-associated genetic variants. "These genetic signatures are a new advance towards personalized genomics and predictive medicine, where this analytic method may prove to be generally useful in prevention and screening of numerous diseases, as well as the tailored uses of medications," said Perls.

The researchers developed a new statistical approach to analyze genetic data from more than 1,000 centenarians and several control groups, and to identify variants most predictive of being centenarians or not. "The methodology that we developed can be applied to other complex genetic traits, including Alzheimer's disease, Parkinson's, cardiovascular disease and diabetes," Sebastiani said.