

CRACKING THE LONGEVITY CODE

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Living to a ripe old age takes more than a healthy lifestyle: you've got to have the right combination of genes. The question is, which ones? Scientists now have several promising candidates thanks to the discovery of a gene variation in humans that appears to increase lifespan and lower the risk of cardiovascular diseases. The finding could eventually lead to the development of life-extending drugs.

Studies of worms and fruit flies show that variations, or polymorphisms, in a single gene can affect how long these creatures live. Scientists think humans carry tens or even hundreds of related polymorphisms. But they're tough to identify –researchers have found only a few since the mid-1990s. In 2003, Nir Barzilai and Gil Atzmon, who study aging at Albert Einstein College of Medicine in New York, discovered that people with a certain polymorphism of the cholesterol-influencing gene *CETP* lived longer than those without it ([ScienceNOW](#), October 2003). Now the researchers have identified another part of the longevity code.

In a study reported in this month's issue of *PLoS Biology*, Barzilai and Atzmon examined the genetic makeup of 213 centenarians. All were Ashkenazi Jews, a group with a relatively uniform genetic pool in which differences tend to stand out. The researchers also compared the centenarians' children with a control group comprised of individuals whose parents died before reaching 85. They found that 25% of the centenarians carried a particular variation of the gene *APOC3*, which helps determine cholesterol levels. The same variation was found in 20% of their children but only 10% of the control group, suggesting that long life runs in families. Those with the polymorphism were 15% less likely to have high blood pressure and had a significantly decreased risk for cardiovascular disease or diabetes.

A drug that mimics the function of the *CETP* gene is already in development, says Atzmon, and the same could happen with *APCO3*. Eventually multiple gene

functions could be simulated by a single pill. "You'd take it once a day like a vitamin," he says.

The researchers have done a "remarkable job" of recruiting and studying a rare population, says Thomas Perls, a geriatrician at Boston Medical Center in Massachusetts. What's needed now is confirmation in other groups, says Bard Geesaman, a scientist at Elixir Pharmaceuticals—which develops drugs for age-related diseases—in Cambridge, Massachusetts. And researchers will have to discover many more of the genes involved before they can fully understand their collective impact on health, he says.