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Scientists' Genetic Work Earns Nobel Prize

Three Americans Share Award For Medicine

By [Rob Stein](#)

Washington Post Staff Writer

Tuesday, October 6, 2009

Three American scientists shared a Nobel Prize on Monday for deciphering how cells protect their genes as they divide repeatedly throughout an organism's life, a crucial discovery with far-reaching implications for aging's effects, as well as cancer and other diseases.

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FILE - In this file photo of Saturday, March 14, 2009 U.S. biologists Elizabeth H. Blackburn from San Francisco, left, and Carol Greider from Baltimore pose next to a bust of Paul Ehrlich before they were awarded the Paul Ehrlich and Ludwig Darmstaedter science prize in Frankfurt, Germany. On Monday Oct. 5, 2009 Sweden's Karolinska institute gave the 2009 Nobel Prize in medicine to Americans Elizabeth Blackburn, Carol Greider and Jack Szostak. The institute says the trio was awarded "for the discovery of how chromosomes are protected by telomeres and the enzyme telomerase." (AP Photo/Michael Probst, File) (Michael Probst - AP)

THIS STORY

Scientists' Genetic Work Earns Nobel Prize

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Elizabeth H. Blackburn of the University of California at San Francisco, Carol W. Greider of Johns Hopkins University in Baltimore and Jack W. Szostak of Harvard Medical School in Boston were awarded the \$1.4 million 2009 Nobel Prize in Physiology or Medicine. It was the first time two women shared the prize.

"I'm dazed," said Blackburn, 60, who was awakened before 2 a.m. West Coast time by the call from the Karolinska Institute in Stockholm. "I'm dazed but thrilled. It's starting to sink in."

The scientists won for a series of experiments they conducted in the 1970s and 1980s that showed that the long, intricate molecules known as chromosomes, which carry genes inside every cell, have protective structures on their ends -- often likened to the plastic

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tips on shoelaces -- called telomeres, which are replenished with an enzyme dubbed telomerase.

The work "solved a major problem in biology" and has led to groundbreaking insights into the aging process and potentially to new treatments for cancer and many other health problems, the Nobel Assembly said.

"This is a fundamental biological mechanism," said Rune Toftgard of the Karolinska Institute.

Greider, 48, said she received the call notifying her that she had won just before 5 a.m., as she was folding laundry before her morning workout.

"I'm an early riser," Greider said. "My heart just started to get going. It was very exciting."

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Scientists had long known that the two-stranded chromosomes had some type of structures on their tips. The mystery was: Did these structures keep the chromosomes from degrading too quickly, and was there an enzyme that helped maintain the tips every time a cell divided?

Blackburn, who was born in Australia and has dual Australian and U.S. citizenship, began to tackle this puzzle by studying the chromosomes of the tetrahymena, a single-celled organism found in pond water. In 1978, she reported the structure of DNA at the

ends of the organism's chromosomes.

Blackburn's findings caught the interest of Szostak, who was doing similar work with yeast. Szostak began working with Blackburn to attach the sequence she discovered to artificial "minichromomes," which they inserted into yeast cells. The experiment, whose results were published in 1982, protected the yeast's chromosomes from degrading.

"It was quite an exciting moment," said Szostak, 56, who was born in London and is now working on building artificial cells to explore the origins of life. "To our surprise it turned out to have important medical implications."

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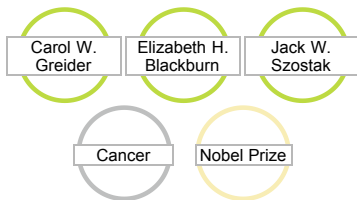
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Safeguarding DNA

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