US trio win Nobel Medicine Prize for research into ageing (Update 3)

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U2 frontman and activist Bono sits with Elizabeth Blackburn, a cell and molecular biologist, as they receive honorary degrees at the University of Pennsylvania in 2004. US trio Blackburn, Carol W. Greider and Jack W. Szostak have won the Nobel Medicine Prize for discovering an enzyme which helps chromosomes in cells stay eternally young, the Nobel jury said.

Australian-American researcher Elizabeth Blackburn and Carol Greider and Jack Szostak of the United States won the Nobel Medicine Prize on Monday for identifying a key switch in cellular ageing.

The trio were honoured for discovering how chromosomes are protected by telomeres and the role of an enzyme called telomerase in maintaining or stripping away this vital shield.

"The award of the Nobel Prize recognises the discovery of a fundamental mechanism in the cell, a discovery that has stimulated the development of new therapeutic strategies," the Nobel jury said.

Blackburn and Greider are only the ninth and tenth women to win the Nobel Medicine Prize since 1901 -- out of a total 195 medicine laureates -- and this is the first time two women have shared the honour.

But Nobel committee secretary Goeran Hansson said gender played no part in the decision.

"They're not being honoured because they are women. They are being honoured because they've made a fundamentally important discovery," he told Swedish news agency TT.

The new laureates said they were overjoyed.

Greider, 48, a molecular biology and genetics professor at Johns Hopkins University School of Medicine in Baltimore, told Swedish Radio she was "just thrilled."

"I just think that the recognition for curiosity-driven basic science is very, very nice," she said, adding that she was up doing laundry in the US when the early-morning call came from Sweden.

Blackburn, 60, who teaches biology and physiology at the University of California in San Francisco, said she knew when they made their Christmas Day 1984 discovery that they were on to something big.

"I felt very excited ... and I thought this is very interesting, this is a very important result, and you don't often feel that about a result," said Blackburn, who was inspired to become a scientist when she read as a teenager a biography about double-Nobel laureate Marie Curie.

Australia hailed its first female Nobel winner.

"Her achievement is an inspiration for all Australian scientists and those considering a career in science -- especially for young women," acting science minister Craig Emerson said.

Szostak, 56, a professor of genetics at Massachusetts General Hospital in Boston, said he planned to celebrate with "a big party at some point" and was "looking forward to seeing Stockholm in winter with the kids" at the Nobel prize ceremony in December.

Telomeres are a minute yet vital factor in ageing. They are like a nubby, protective cap, fitting on the ends of the strands of DNA -- the chemical recipe for life -- that are packed into chromosomes.

After Blackburn's studies in 1980 on a single-cell organism known as Tetrahymena, or pond scum, she and Szostak discovered in 1982 that a unique DNA sequence in the telomeres protects the chromosomes from damage when the cells divide.

In 1984, Blackburn and her then grad student, Greider, also identified telomerase, the enzyme that makes the telomere DNA.

If telomeres become worn, cells age.

But if telomerase levels are high, the telomere length is maintained, and cellular ageing is braked. A small number of rare but very destructive diseases, including a form of severe anaemia, are linked to defective telomerase, resulting in damaged cells.

Excited by these breakthroughs, many experts initially speculated ageing could be pinned to telomere shortening.

But the ageing process has emerged as something that encompasses different factors, as well as telomeres.

In addition, high levels of telomerase also help cancer, enabling its cells to replicate endlessly and achieve what scientists call "cellular immortality."

Blocking cancer through "telomerase inhibitors" is one of the most eagerly explored areas of medical research.

The three won the 2006 Lasker Prize, one of the most prestigious US science awards, and in 2007, Blackburn was named one of Time magazine's 100 most influential people in the world.

The Nobel prizes for physics, chemistry, literature and peace are announced on consecutive days from Tuesday, followed on October 12 by the award for economics.

Laureates receive a gold medal and 10 million Swedish kronor (1.42 million dollars, 980,000 euros), divisible between up to three winners per prize. The awards ceremonies take place in Stockholm and Oslo on December 10.

More information: http://www.nobelprize.org

US Nobel winner says prize recognizes 'pure curiosity'

A researcher at Johns Hopkins University said Monday that work that won her this year's Nobel prize for medicine illustrates the importance of "discoveries driven by pure curiosity."

Carol Greider shared this year's award with two other US scientists for their discovery of telomerase, an enzyme that helps chromosomes in

cells stay eternally young. Their discovery has implications for the understanding of cancer and aging.

In a statement released by Baltimore, Maryland-based Johns Hopkins, Greider said the award recognized that curiosity drives some of the most important scientific research.

"We had no idea when we started this work that telomerase would be involved in cancer, but were simply curious about how chromosomes stayed intact," said Greider.

"Our approach shows that while you can do research that tries to answer specific questions about a disease, you can also just follow your nose."

Greider shares the Nobel prize with Elizabeth Blackburn of the University of California, San Francisco, and Jack Szostak, of Harvard Medical School.

Blackburn, a molecular biologist, was hailed for her pathbreaking contributions to science by colleagues at the University of California, San Francisco.

"Her generous spirit, curiosity and highly collaborative nature have led her to forge research partnerships that have significantly broadened scientists' capacity to understand the remarkable telomerase enzyme," said UCSF chancellor Susan Desmond-Hellmann.

"As a scientist, a colleague, a mentor and a woman in science, she is an inspiration to the nation and the world," she said.

Stephen Desiderio, director of John's Hopkins Institute for Basic Biomedical Sciences, said the university was "thrilled" that Greider was being recognized for her work, "which reminds us that science is most

powerful when it is driven by curiosity."

Greider, who works at Johns Hopkins School of Medicine, credits her father with her decision to go into science.

"He would say 'You can do whatever you want, but you have to like whatever you do,'" she said.

Nobel laureates 'thrilled' by top honour

US scientist Carol Greider found out she was one of this year's three Nobel Medicine Prize laureates while doing the laundry, she told Swedish public radio SR on Monday.

"I was just thrilled, I just think the recognition for curiosity-driven basic science is very, very nice," she said from the eastern United States.

"I was awake, I wake up early anyway, I was doing the laundry when the phone call came" from the Nobel committee in Stockholm, she said.

Greider, who teaches at Johns Hopkins University in Baltimore and whose name had been mentioned as a possible winner in the run-up to the announcement, added it had been suggested to her that she could receive a call from the Swedish capital early Monday.

She was preparing her children's breakfast when Swedish radio called to interview her.

But her fellow laureate, Australian-American Elizabeth Blackburn, was still sleeping when the Nobel committee called her in San Francisco, where it was about 2:30 am (0930 GMT) when the news became public.

An undated photo shows Elizabeth Blackburn from the University of California in San Francisco. Australian-American researcher Blackburn and Carol Greider and Jack Szostak of the United States have won the Nobel Medicine Prize on Monday for identifying a key molecular switch in cellular ageing.

"I was indeed (asleep). In fact, I think I'm still sleeping, sometimes I think I'm dreaming," she told SR.

Blackburn and Greider, along with American Jack Szostak, were awarded the Nobel prize for identifying a key molecular switch in cellular ageing.

The trio were honoured for the discovery of how chromosomes are protected by telomeres and the role of an enzyme called telomerase in maintaining or stripping away this molecular shield.

"We'd been hunting for this enzyme and when the first clear signs of it appeared ... I thought 'this is very interesting, this is a very important result,' and you don't often feel that about a result," Blackburn said.

Szostak was overjoyed when speaking to SR from his home in Boston.

He explained that the Nobel committee's call had woken him up, even

though he had considered the "not very likely" possibility an early morning call could come from Sweden.

"I said (to my wife) it'll probably come at around 5:30 am, but it came much earlier so I was still sound asleep," he said, a chuckle in his voice.

Nobel Medicine Prize: Previous US laureates

Here is a list of US winners of the Nobel Medicine Prize, awarded Monday to three US scientists, Carol Greider, Jack Szostak and Elizabeth Blackburn, who is also an Australian citizen:

2009: Carol Greider and Jack Szostak (US), Elizabeth Blackburn (Australia-US)

2007: Mario Capecchi and Oliver Smithies (with Martin Evans of Britain)

2006: Andrew Z. Fire, Craig C. Mello

2004: Richard Axel, Linda B. Buck

2003: Paul C. Lauterbur (with Peter Mansfield of Britain)

2002: H. Robert Horvitz (with Sydney Brenner and John E. Sulston of Britain)

2001: Leland Hartwell (with Timothy Hunt and Paul Nurse of Britain)

2000: Paul Greengard and Eric Kandel (with Arvid Carlsson of Sweden)

1999: Guenter Blobel

1998: Robert Furchgott, Louis Ignarro, Ferid Murad

1997: Stanley Prusiner

1995: Edward Lewis and Eric Wieschaus (with Christiane Nuesslein-Volhard,

Germany)

1994: Alfred Gilman and Martin Rodbell

1993: Phillip Sharp (with Richard Roberts, Britain)

1992: Edmond Fischer and Edwin Krebs

1990: Joseph Murray and Donnall Thomas

1989: Michael Bishop and Harold Varmus

1988: Gertrude Elion and George Hitchings (with James Black, Britain)

1986: Rita Levi-Montalcini and Stanley Cohen

1985: Michael Brown and Joseph Goldstein

1983: Barbara McClintock

1981: Roger Sperry and David Hubel (with Torsten Wiesel, Sweden)

1980: Baruj Benacerraf and George Snell (with Jean Dausset, France)

1979: Allan Cormack (with Godfrey Hounsfield, Britain)

1978: Daniel Nathans and Hamilton Smith (with Werner Arber, Switzerland)

1977: Roger Guillemin, Andrew Schally and Rosalyn Yalow

1976: Baruch Blumberg and Carleton Gajdusek

1975: David Baltimore, Renato Dulbecco and Howard Temin

1974: George Palade (with Albert Claude and Christian de Duve, Belgium)

1972: Gerald Edelman (with Rodney Porter, Britain)

1971: Earl Sutherland Jr

1970: Julius Axelrod (with Bernard Katz, Britain and Ulf von Euler, Sweden)

1969: Max Delbruck, Alfred Hershey and Salvador Luria

1968: Robert Holley, Har Khorana and Marshall Nirenberg

1967: Haldan Hartline and George Wald (with Ragnar Granit, Sweden)

1966: Peyton Rous and Charles Huggins

1964: Konrad Bloch (with Feodor Lynen, Germany)

1962: James Watson (with Francis Crick and Maurice Wilkins, Britain)

1961: Georg von Bekesy

1959: Severo Ochoa and Arthur Kornberg

1958: George Beadle, Edward Tatum and Joshua Lederberg

1956: Andre Cournand and Dickinson Richards (with Werner Forssmann, Germany)

1954: John Enders, Thomas Weller and Frederick Robbins

1953: Fritz Lipman (with Hans Krebs, Britain)

1952: Selman Waksman

1950: Edward Kendall and Philip Hench (with Tadeus Reichstein, Switzerland)

1947: Carl Cori and Gerti Cori (with Bernardo Houssay, Argentina)

1946: Hermann Muller

1944: Joseph Erlanger and Herbert Gasser

1943: Edward Doisy (with Henrik Dam, Denmark)

1934: George Whipple, George Minot and William Murphy

1933: Thomas Morgan