Biological clock discoveries by three Americans earn Nobel prize (Update)

October 2 2017, by Jim Heintz And David Keyton

Winners of the 2017 Nobel Prize for Medicine are displayed, from left, Jeffrey C. Hall, Michael Rosbash and Michael W. Young, during a press conference in Stockholm, Monday Oct. 2, 2017. The Nobel Prize for Medicine has been awarded to the three Americans for discoveries about the body's daily rhythms. (Jonas Ekstromer/TT via AP)

Three Americans won a Nobel Prize on Monday for discovering key genetic "gears" of the body's 24-hour biological clock, the mechanism best known for causing jet lag when it falls out of sync.

Problems with our body clock also been linked to such disorders as sleep problems, depression, heart disease, diabetes and obesity. Researchers are now trying to find ways to tinker with the clock to improve human health, the Nobel committee said in Stockholm.

It awarded the $1.1 million (9 million kronor) Nobel Prize in Physiology or Medicine to Jeffrey C. Hall and Michael Rosbash, who worked together at Brandeis University in Massachusetts, and Michael W. Young of Rockefeller University in New York.

They "were able to peek inside our biological clock" and discover details of its inner workings, the Nobel citation said.

The work, done in fruit flies and dating back to 1984, identified genes and proteins that work together in people and other animals to synchronize internal activities throughout the day and night. Various clocks in the brain and elsewhere in the body, working together, regulate things like sleep patterns, eating habits and the release of hormones and blood pressure. Such 24-hour patterns are called circadian rhythms.

At age 72, the retired Hall wryly noted that he was already awake when the call about the prize came around 5 a.m., because of age-related changes in his own circadian rhythms.

"I said 'Is this a prank'?" he told The Associated Press by telephone from his home in Cambridge, Maine.

Rosbash, a 73-year-old professor at Brandeis, told the AP that he and his two colleagues worked to understand "the watch ... that keeps time in our brains."

"You recognize circadian rhythms by the fact that you get sleepy at 10 or 11 at night, you wake up automatically at 7 in the morning, you have a

dip in your alertness in the midday, maybe at 3 or 4 in the afternoon when you need a cup of coffee, so that is the clock," he explained.

"The fact that you go to the bathroom at a particular time of day, the fact if you travel over multiple time zones your body is screwed up for several days until you readjust—all that is a manifestation of your circadian clock."

This undated photo provided by The Rockefeller University shows Michael W. Young, who was one of three Americans awarded the Nobel Prize in Physiology or Medicine on Monday, Oct. 2, 2017, for discoveries about the body's daily rhythms. The other winners are are Jeffrey C. Hall and Michael Rosbash. (Mario Morgado/The Rockefeller University via AP)

Jay Dunlap, who studies biological clocks in bread mold at Dartmouth College's medical school, called the Nobel-winning work "beautiful." It helped expose the molecular details behind daily rhythms, he said. Such knowledge can be important in telling when to deliver drugs for maximum effect, and perhaps for developing new ones, he said.

Michael Hastings, a scientist at the U.K. Medical Research Council, said the field of body clock study "has exploded massively, propelled by the discoveries by these guys." Nobel committee member Carlos Ibanez said the work helped in understanding how people adapt to shiftwork.

Michael Rosbash takes a phone call at his home, Monday, Oct. 2, 2017, in Newton, Mass. Rosbach is one of the Americans awarded this year's Nobel Prize in physiology or medicine for discovering the molecular mechanisms that control

humans' circadian rhythm. (AP Photo/Bill Sikes)

Young, 68, said genes that control our body clock were revealed "just like puzzle pieces." The research showed "the way they worked together to provide this beautiful mechanism."

Hall said that once scientists understand how the clock normally works, "that gives you a chance, not an inevitability, but a chance to influence the internal workings of the clock and possibly to improve a patient's well-being."

Thomas Perlmann, Chariman of the Nobel Committee of Medicine, announces the winners of the 2017 Nobel Prize for Medicine during a press conference at the Nobel Forum in Stockholm, Monday Oct. 2, 2017. The Nobel Prize for

Medicine has been awarded to three Americans for discoveries about the body's daily rhythms. The laureates are Jeffrey Hall, Michael Rosbash and Michal Young. (Jonas Ekstromer/TT via AP)

Rosbash said he thinks most of the practical applications of the work lie in the future.

A genetic mutation has already been found in some people who have a chronic sleeping problem, Young said.

"This gives us a target to work on (and) ways of thinking we didn't have before," he said. "I think we're going to run into this over and over."

Anna Wedell, chairman of the Nobel committee, center, and members of the committee Juleen Zierath, left, and Carlos Ibanez, announce the winners of the 2017 Nobel Prize for Medicine during a press conference at the Nobel Forum in

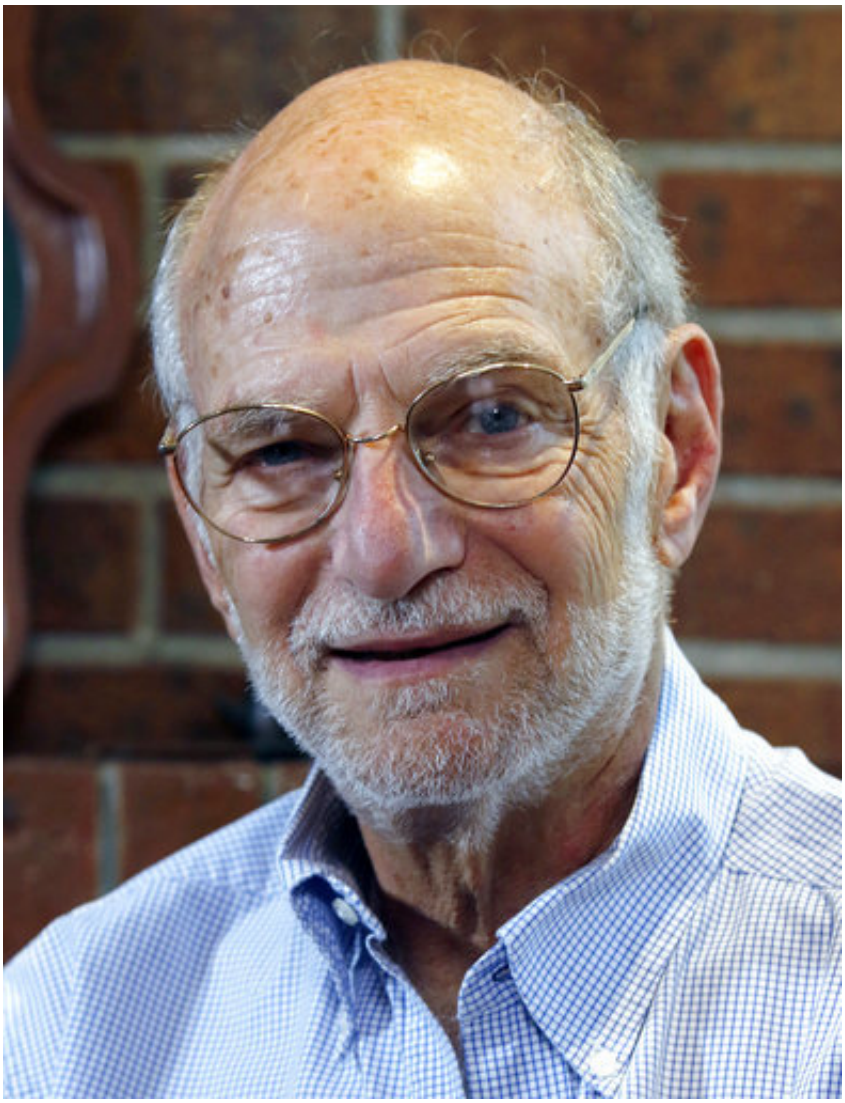
Stockholm, Monday Oct. 2, 2017. The Nobel Prize for Medicine has been awarded to three Americans for discoveries about the body's daily rhythms. The laureates are Jeffrey c. Hall, Michael Rosbash and Michael W. Young. (Jonas Ekstromer/TT via AP)

Monday's award was the first of this year's Nobel Prizes to be announced. The physics prize will be given Tuesday, followed by the chemistry prize on Wednesday. The prizes were established by the will of Swedish industrialist Alfred Nobel, who died in 1896.

In this Thursday, Oct. 13, 2016 file photo, permanent Secretary of the Swedish Academy Sara Danius announces that Bob Dylan is awarded the 2016 Nobel Prize in Literature during a presser at the Old Stockholm Stock Exchange Building in Stockholm, Sweden. The panel that awards the Nobel Prize in literature says this year's winner will be announced Thursday, Oct. 5, 2017. In 2015 and 2016, the award went to writers outside the conventional conception of

"literature" as novels and poetry. Svetlana Alexievich's books are artistic sociopolitical reportage, and Bob Dylan's lyrics arguably have more power as song than on the page. (Jonas Ekstromer / TT via AP, File)

In this Jan. 12, 2012, file photo, Bob Dylan performs in Los Angeles. The panel that awards the Nobel Prize in literature says this year's winner will be announced Thursday, Oct. 5, 2017. In 2015 and 2016, the award went to writers outside the conventional conception of "literature" as novels and poetry. Svetlana Alexievich's books are artistic sociopolitical reportage, and Bob Dylan's lyrics arguably have more power as song than on the page. (AP Photo/Chris Pizzello, File)



Michael Rosbash smiles during an interview at his home, Monday, Oct. 2, 2017, in Newton, Mass. Rosbach is one of the Americans awarded this year's Nobel Prize in physiology or medicine for discovering the molecular mechanisms that control humans' circadian rhythm. (AP Photo/Bill Sikes)

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Recent winners of the Nobel Medicine Prize

Here is a list of the winners of the Nobel Medicine Prize in the past 10 years, awarded on Monday to US geneticists Jeffrey Hall, Michael Rosbash and Michael Young for their work on internal biological clocks:

2017: US geneticists Jeffrey Hall, Michael Rosbash and Michael Young for their discoveries on the internal biological clock that governs the wake-sleep cycles of most living things.

2016: Yoshinori Ohsumi of Japan for his work on autophagy—a process whereby cells "eat themselves"—which when disrupted can cause Parkinson's and diabetes.

2015: William Campbell (US citizen born in Ireland) and Satoshi Omura (Japan), Tu Youyou (China) for unlocking treatments for malaria and roundworm.

2014: John O'Keefe (Britain, US), Edvard I. Moser and May-Britt Moser (Norway) for discovering how the brain navigates with an "inner GPS".

2013: Thomas C. Suedhof (US citizen born in Germany), James E. Rothman and Randy W. Schekman (US) for work on how the cell organises its transport system.

2012: Shinya Yamanaka (Japan) and John B. Gurdon (Britain) for discoveries showing how adult cells can be transformed back into stem cells.

2011: Bruce Beutler (US), Jules Hoffmann (French citizen born in Luxembourg) and Ralph Steinman (Canada) for work on the body's immune system.

2010: Robert G. Edwards (Britain) for the development of in-vitro fertilisation.

2009: Elizabeth Blackburn (Australia-US), Carol Greider and Jack Szostak (US) for discovering how chromosomes are protected by telomeres, a key factor in the ageing process.

2008: Harald zur Hausen (Germany), Francoise Barre-Sinoussi and Luc Montagnier (France) for work on the viruses causing cervical cancer and AIDS.

More information: www.nobelprize.org/nobel_prize … ates/2017/press.html