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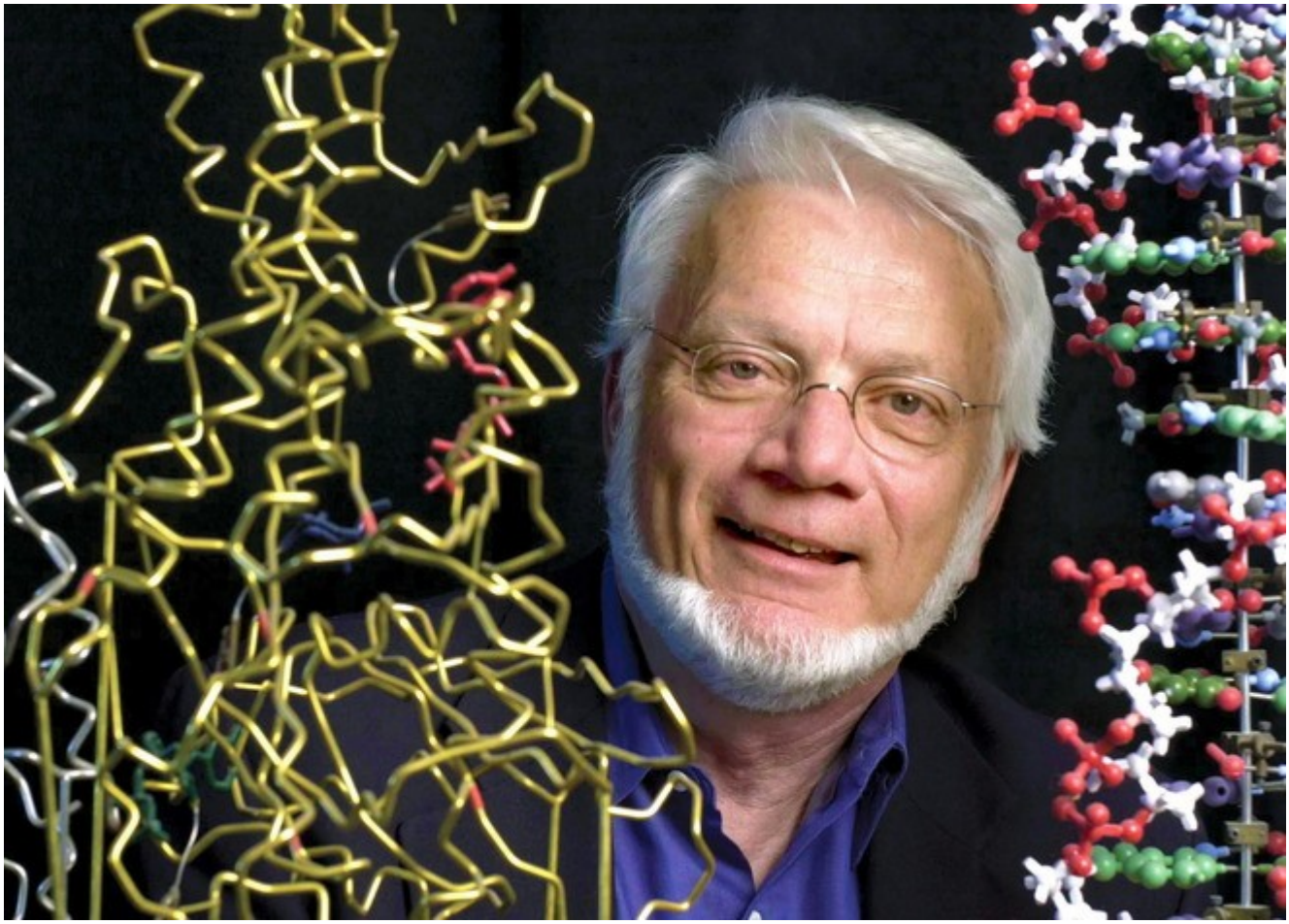
Inquisitiveness of Milwaukee native leads to a Nobel prize



Bloomberg

Thomas A. Steitz, Sterling professor of molecular biophysics and biochemistry at Yale University, won the Nobel Prize in chemistry for work that revealed the structure and function of ribosomes, which transform DNA into proteins.

By Mark Johnson of the Journal Sentinel

Oct. 8, 2009

Associated Press

Thomas Steitz (second from left) walks with associates Wednesday at Yale University in New Haven, Conn. Steitz awoke Wednesday to a call from Sweden and learned he won the 2009 Nobel Prize in chemistry. Nobel committee members offered personal congratulations.

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Many miles and years removed from the competitive dinner-table debates of his childhood in Milwaukee and Wauwatosa, Yale chemist Thomas A. Steitz awoke at 5:20 Wednesday morning to the sound of a ringing phone, long distance from Sweden.

Steitz, the caller said, had won the 2009 Nobel Prize in chemistry. One by one, members of the Nobel Committee then got on the phone to offer personal congratulations.

"They wanted to be sure I knew this was not a hoax," Steitz said in an interview with the Journal Sentinel. "Since I knew some of the members of the committee, I could recognize their voices."

Sharing the prize and the $1.4 million with Steitz, 69, were Venkatraman Ramakrishnan of the MRC Laboratory of Molecular Biology in England and Ada E. Yonath of the Weizmann Institute of Science in Israel. The three scientists were honored for fundamental work that revealed the structure and function of ribosomes, which transform our DNA into the proteins necessary for virtually every human action from breathing to thinking.

The work, beginning in the 1970s and continuing today, has helped scientists understand the basic machinery of life and is being used to develop a new generation of antibiotics designed to defeat resistant strains of bacteria.

In recognizing the discovery, the Nobel Committee paid tribute to a scientific progression that began 56 years ago with the paper by James Watson and Francis Crick revealing the structure of DNA. That work was honored with the 1962 Nobel Prize in medicine.

Information from DNA is passed to RNA. Work elucidating the role and structure of RNA led to the 1968 Nobel Prize in medicine awarded to Har Gobind Khorana of the University of Wisconsin-Madison and researchers Robert W. Holley and Marshall W. Nirenberg.

It stood to reason that the prize would eventually recognize the crucial role of ribosomes, the bodies inside living cells that serve as protein factories. The Nobel announcement Wednesday noted that while DNA is often called the blueprint of life, "the DNA molecule is passive. If there were nothing else, there would be no life."

It is ribosomes that transform the blueprint into living matter.

For years, scientists recognized that understanding ribosomes would be immensely important and immensely daunting. The ribosome includes two parts, a large and small sub-unit. To know the structure of a ribosome would mean mapping the linkages and configurations of 100,000 atoms in the large sub-unit - which was precisely what Steitz set out to do.

Steitz at the forefront

"He's always been right out there at the edge of what is doable," said Peter Moore, a chemistry professor at Yale who worked with Steitz on the ribosome project. "It takes some courage to do that because you can fall flat on your face."

"It looked much harder from the panic point of starting," Steitz said of his task. "It's like climbing a mountain. It looks very, very hard until you stand on top."

Steitz was the oldest of five children, born into a Milwaukee family that stressed intellectual, if not necessarily scientific, pursuits. His father, Arthur Steitz, was a lawyer who at one time worked for the Milwaukee County Hospital. Catherine Steitz, his mother, was a college-educated woman who chose the role of stay-at-home mom.

"Six p.m. was supper and we all were there, and the conversation around our table was intellectually competitive," said William Steitz, Thomas' younger brother by seven years. "Somebody would bring up a topic, and someone else would debate."

The family members would vie to show who had the most knowledge of the subject and who could express it best. According to his brother, Thomas Steitz was very intellectual, though "not a nerd." He tended to become bored "by mundane kinds of things."

At Wauwatosa High School, Thomas Steitz was an A student who played saxophone and graduated near the top of his class. But it was not until he went to Lawrence College, now known as Lawrence University, that he discovered chemistry, which seemed the perfect match for his natural curiosity.

"He was the kind of student who always asked questions and went beyond what was in the book," said Robert Rosenberg, 83, his academic adviser and now an adjunct professor of chemistry at Northwestern University.

The professor and student have stayed in touch for more than four decades as Steitz's work took him to Harvard for his PhD in molecular biology and biochemistry and to Yale where he joined the faculty in 1970. Steitz is also an investigator with the Howard Hughes Medical Institute, where his wife, Joan A. Steitz, also works. They have a son, Jon, who pitched in the Milwaukee Brewers organization.

Work began in 1995

Thomas Steitz's critical work in unraveling the structure and mechanism of ribosome took five

years, beginning in 1995.

"You have to have a tolerance for pain because it isn't going to come easy, and it didn't come easy," remarked Moore, his colleague at Yale.

Working independently, Steitz, Ramakrishnan and Yonath all used a technique called X-ray crystallography, which allows scientists to figure out the arrangement of atoms within a crystal. Steitz published his work in the journal Science in 2000.

"When he published the story," said Ashley Haase, a former Lawrence classmate who now leads the microbiology department at the University of Minnesota. "I told him, 'This is worth a Nobel Prize. Congratulations.'

"It's so fundamental to understand the mechanism by which proteins are made."

About the same time, Steitz's former adviser Rosenberg read the paper and had a similar thought: "This is Nobel quality."

As often happens with such work, colleagues and friends sometimes raised the subject of "the Swedish Prize" as if it were almost a certainty. He would tell them, "Oh, I don't know."

William Steitz, a longtime police officer in Germantown, said his brother was always mild-mannered and low-key, but the family had talked about the likelihood of his winning the Nobel. Still, each year the October announcements passed without mention of his brother's name and "to be honest with you, I had almost given up hope," William Steitz said.

Then Wednesday, the phone rang at his Germantown home and his wife answered. He heard his brother's name mentioned and the cop in him made William Steitz hope it wasn't something bad.

But he saw the tears in his wife's eyes and the smile on her face, and he knew what it was.

Sweden had called for his brother.

The Nobel Prize in Chemistry 2009

Venkatraman Ramakrishnan, Thomas A. Steitz, Ada E. Yonath

The Nobel Prize in Chemistry 2009

Nobel Prize Award Ceremony

Venkatraman Ramakrishnan

Thomas A. Steitz

Ada E. Yonath

Photo: U. Montan

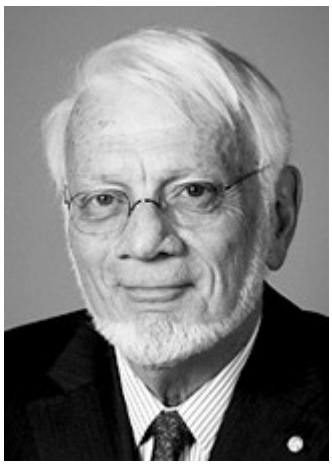

Photo: U. Montan

Photo: U. Montan

Venkatraman Ramakrishnan

Thomas A. Steitz

Ada E. Yonath

The Nobel Prize in Chemistry 2009 was awarded jointly to Venkatraman Ramakrishnan, Thomas A. Steitz and Ada E. Yonath *"for studies of the structure and function of the ribosome"*.

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The Steitz Lab

Tom Steitz

Biographical Sketch

- Yale Faculty (1970-present)
- Investigator, Howard Hughes Medical Institute (1986-present)
- Visiting Professor, University of Colorado, Boulder, (1992-1993)
- Fairchild Scholar, Caltech (1984-1985)
- Macy Fellow, Gottingen, Germany (1976-1977)
- Jane Coffin Childs Postdoctoral Fellow, MRC Laboratory of Molecular Biology, Cambridge, England (1967-1970)
- Ph.D. Harvard University (1966)

Awards and Distinctions

- Nobel Prize in Chemistry (2009)
- Gairdner International Award (2007)
- Keio Medical Science Prize (2006)
- AAAS Newcomb Cleveland Prize (2001)
- Rosenstiel Award for Distinguished Work in Basic Medical Research (2001)
- Member, National Academy of Sciences (1990)
- Pfizer Award in Enzyme Chemistry (1980)

Thomas A. Steitz

Thomas A. Steitz

Nacimiento	23 de agosto de 1940 (71 años) Milwaukee, Wisconsin
Residencia	Estados Unidos
Nacionalidad	estadounidense
Campo	Cristalografía
Instituciones	Howard Hughes Medical Institute, Universidad de Yale
Conocido por	Bio-cristalografía
Premios destacados	Premio Nobel de Química (2009).

Thomas Arthur Steitz (23 de agosto de 1940) es Profesor Sterling de Biofísica y Bioquímica Molecular, Instituto Médico Howard Hughes, Universidad de Yale, New Haven, Connecticut, Estados Unidos. Steitz fue galardonado con el Premio Nobel de Química en 2009 junto con Venkatraman Ramakrishnan y Ada Yonath por el estudio de la estructura y función del ribosoma.1 Steitz también ganó el Premio Internacional Gairdner en 20072 por sus estudios sobre la estructura y función del ribosoma, que mostró que la peptidil transferasa fue una reacción catalizada por el RNA, y por revelar el mecanismo de inhibición de esta función por los antibióticos.3

Steitz nació en Milwaukee, Wisconsin,1 estudió química en el Lawrence College y recibió un doctorado en Bioquímica y Biología Molecular de la Universidad de Harvard en 1966. Está casado con Joan A. Steitz, también profesor de Biofísica y Bioquímica Molecular de Yale.

Referencias

1. ↑ *a b* 2009 Nobel Prize in Chemistry, Nobel Foundation.
2. ↑ Tom Steitz, Thomas Steitz Lab.
3. ↑ Thomas A. Steitz, The Gairdner 50 Foundation.

Enlaces externos

- Wikimedia Commons alberga contenido multimedia sobre **Thomas A. Steitz**.
- "Inquisitiveness of Milwaukee native leads to a Nobel Prize", *The Milwaukee Journal Sentinel*.

Categorías: Nacidos en 1940 | Premios Nobel de Estados Unidos | Biofísicos | Milwaukies | Bioquímicos de Estados Unidos | Alumnado de la Universidad Harvard | Premio Nobel de Química

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