

Nobel Prizes 2009

Chemistry: V. Ramakrishnan, T. A. Steitz and A. E. Yonath

The Royal Swedish Academy of Sciences awarded the Nobel Prize in Chemistry 2009 to Venkatraman Ramakrishnan, (MRC Laboratory of Molecular Biology, Cambridge, UK), Thomas A. Steitz (Yale University, New Haven, CT, USA), and Ada E. Yonath (Weizmann Institute of Science, Rehovot, Israel) for studies into the structure and function of the ribosome. By using X-ray diffraction, they were able to build a bridge between DNA and proteins. Thanks to this work, antibiotics can be developed that suppress the synthesis of proteins.

Ramakrishnan first studied physics at the universities of Baroda (India) and Ohio (USA), and carried out research for his PhD on the ferroelectric properties of KH_2PO_4 . As a postdoctoral fellow, he then moved into research in biology at the University of California in San Diego. In the years 1978–1982, he worked at the Yale University, 1983–1995 as biophysicist at the Brookhaven National Laboratory, and 1995–1999 as Professor at the University of Utah. In 1999, he took up a position at the MRC Laboratory in Cambridge, where he was named a Fellow at Trinity College in 2008.

Steitz completed his doctorate in 1966 at Harvard University under W. N. Libscomb, and thereafter worked at the MRC Laboratory in Cambridge. Since 1970, he has been researching and teaching at Yale University, with guest stays in Göttingen (1976/77), Pasadena (Caltech, 1984/85), and Boulder (University of Colorado, 1992/93) in between. Since 1986, he is also a researcher at Howard Hughes Medical Institute.

Yonath studies Chemistry and Biochemistry at the Hebrew University, Jerusalem. She completed her doctorate in 1968 at the Weizmann Institute of Science in Rehovot (Israel), where she carried out crystallographic investigations on proteins from 1970 after a stay in the USA (Carnegie Mellon University, Pittsburgh, and Massachusetts Institute of Technology, Cambridge). Since 1989, she has been Director of the Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly, and she has been professor of structural biology at the Weizmann Institute since 1988. Until 2004, she was also the head of the research group for molecular biology at the Max Planck Institute of DESY in Hamburg. Yonath is a member of the Editorial Advisory Board of *ChemBioChem*. This year, she presented a Minireview on the surprising stereochemistry of ribosome, and a Review on its mode of function, in the *Journal of Peptide Science*.

In 2003 she described the relationship between structure and function in ribosomal RNA targeting in *ChemBioChem*.^[1] She will give a lecture at the symposium on the occasion of the tenth anniversary of *ChemBioChem* and *ChemPhysChem* in May 2010 in Paris. Ada Yonath is only the fourth woman to receive the Nobel Prize in Chemistry (after M. Curie, 1911, I. Joliot-Curie, 1935, and D. Crowfoot Hodgkin, 1964).

Physiology or Medicine

The Nobel Committee at the Karolinska Institute awarded the Nobel Prize in Physiology or Medicine 2009 to Elizabeth H. Blackburn (UC San Francisco), Carol W. Greider (Johns Hopkins University, Baltimore, MD), and Jack W. Szostak (Harvard University) for their work on how chromosomes are protected by telomeres and telomerase. The three researchers discovered how the chromosomes are copied and provide insights into the aging process. Blackburn and Greider were presented with the Wiley Prize in Biomedical Sciences in 2006. In 1991, Szostak, together with M. Famulok, presented a Review in *Angewandte Chemie* in the in vitro selection of specific ligand-binding nucleic acids.^[2a] In 2000, T. R. Cech, Chemistry Nobel Laureate 1989, discussed "Life at the End of the Chromosomes: Telomeres and Telomerase".^[2b]

Physics

The Nobel Prize in Physics has been awarded by the Royal Swedish Academy of Sciences in two research areas: Charles K. Kao (Standard Telecommunication Laboratories, Harlow, UK, and the Chinese University of Hong Kong) for the development of optical glass fibers for data transfer purposes, such as the internet, and Willard S. Boyle and George E. Smith (Bell Laboratories, Murray Hill, NJ, USA) for the development of the CCD sensor, which is a light-sensitive semiconductor element, without which digital photography would not be possible.

- [1] a) E. Zimmerman, A. Yonath, *ChemBioChem* **2009**, *10*, 63; *ChemBioChem* **2009**, *10*, 198; b) I. Wekselman, C. Davidovich, I. Agmon, E. Zimmerman, H. Rozenberg, A. Bashan, R. Berisio, A. Yonath, *J. Pept. Sci.* **2009**, *15*, 122; c) A. Yonath, *ChemBioChem* **2003**, *4*, 1008.
- [2] a) M. Famulok, J. W. Szostak, *Angew. Chem.* **1992**, *104*, 1001; *Angew. Chem. Int. Ed. Engl.* **1992**, *31*, 979; b) T. R. Cech, *Angew. Chem.* **2000**, *112*, 34; *Angew. Chem. Int. Ed.* **2000**, *39*, 34.

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