Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Ada Yonath

Image: Markus Scholz | Leopoldina

Name: **Ada Yonath**
Date of birth: **22 June 1939**

Research Priorities: Ribosomes, protein biosynthesis, translation, crystal structure, antibiotic resistance

Structural biologist Ada Yonath is considered a pioneer for her work revealing the structure of ribosomes. In 2009, she was awarded the Nobel Prize in Chemistry together with the British structural biologist Venkatraman Ramakrishnan and the US molecular biologist Thomas A. Steitz. The Nobel Committee honoured her “studies on the structure and function of the ribosome.” Lately, her research has focused on the effects of antibiotics on ribosomes.

Academic and Professional Career

since 1989	Director, Kimmelman Center for Biomolecular Assemblies, Weizmann Institute for Science (WIS), Rechovot, Israel
since 1988	Professor of Structural Chemistry, WIS, Rechovot, Israel
1988 - 2004	Director, Mazer Center for Structural Biology, WIS, Rechovot, Israel
1986 - 2004	Head, Max Planck Research Unit, Hamburg, Germany
1984 - 1988	Associate Professor, Department of Structural Chemistry, WIS, Rechovot, Israel
1979 - 1983	Visiting Professor, Max Planck Institute for Molecular Genetics, Berlin, Germany
1977 - 1978	Visiting Scholar, University of Chicago, Chicago, USA
1974 - 1983	Senior Scientist, Department of Structural Chemistry, WIS, Rechovot, Israel
1974	Visiting Professor, Dental School, University of Alabama, Tuscaloosa, USA

1971 - 1978	Lecturer, University of Tel Aviv and Ben-Gurion University of the Negev, Be'er Scheva, Israel
1970 - 1974	Scientist, Institute of Chemistry, WIS, Rechovot, Israel
1970	Postdoctoral Fellow, Institute of Chemistry, Massachusetts Institute of Technology, Cambridge, USA
1969	Postdoctoral Fellow, Mellon Institute of Industrial Research, Pittsburgh, USA
1964 - 1968	PhD in X-ray crystallography, WIS, Rechovot, Israel
1962 - 1964	Master's Degree in Biochemistry, Hebrew University Jerusalem, Jerusalem, Israel
1959 - 1962	Bachelor's Degree in Chemistry, Hebrew University Jerusalem, Jerusalem, Israel

Functions in Scientific Societies and Committees

since 2013	Member, Scientific Advisory Board, UN Secretary-General, UNO
1971 - 1977	Advisor, The Open University of Israel, Ra'anana, Israel
	Member, Scientific Advisory Boards: EC President's Science and Technology Advisory Council; Center of Excellence (I-CORE), Israel; Davidson Institute for Scientific Education; RNA Institute, Albany, USA; National Supreme Committee High Education; MALAG; Vision of Science, Israel
	Member, Advisory Committees: Life 2000, Finland; Biophysics and Nanosystems, Austria; The International Committees & Principal Users Groups at Synchrotron Radiation ESRF, France; APS/Argonne Nat Lab, USA; Cornell High Energy Synchrotron Source (CHESS), USA; The Israeli Academy Committees for Synchrotron Radiation, Microgravity and Bikura (First)

Honours and Awarded Memberships

since 2020	Foreign Member, Royal Society, UK
2019	Honorary Professor, Northwest University, Xian, China
2019	Honorary Doctorate, Jacobs University, Bremen, Germany
2017	India's Prime Minster Gold Medal for Outstanding Scientific Contributions, India
2015	Roentgen Medal, City of Remscheid, Remscheid, Germany
2015	India's Prime Minster Gold Medal of Distinction, India
since 2013	Member, German National Academy of Sciences Leopoldina, Germany

2012	Prakash S. Datta Medal, Federation of European Biochemical Societies (FEBS)
2012	Academia Sinica Award, Academia Sinica, Taipei, Taiwan
2011	City of Florence Award, Florence, Italy
2011	Marie Curie Medal, Polish Chemical Society, Warsaw, Poland
2011	Erna Hamburger Prize, EFEL-WISH Foundation, Lausanne, Switzerland
2010	Wilhelm Exner Medal, Wilhelm Exner Foundation of the Austrian Industry Society, Austria
2009	DESY Golden Pin of Honour, Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany
2009	Nobel Prize in Chemistry (together with Venkatraman Ramakrishnan and Thomas A. Steitz), Royal Swedish Academy of Sciences, Sweden
2009	Erice Prize for Peace, Rome, Vatican City
2008	Albert Einstein World Award of Science, Princeton University, Princeton, USA
2008	UNESCO-L'Oréal Award for European Woman in Life Science, Paris, France
2008	George E. Palade Gold Medal, Wayne State University School of Medicine, Detroit, USA
2008	Linus Pauling Medal, Oregon and Puget Sound Sections, American Chemical Society
2007	Wolf Prize, Wolf Foundation, Herzlia Pituach, Israel
2007	Paul Ehrlich and Ludwig Darmstaedter Prize, Paul Ehrlich Foundation, Frankfurt am Main, Germany
2006	Otto Loewy Lecture, David Herzog Fund of Styrian Universities (David-Herzog-Fonds der steirischen Universitäten), Graz, Austria
2006	EMET Prize, Israel
2006	Rothschild Prize for Life Sciences, Yad Hanadiv, Israel
2005	Louisa Gross Horwitz Prize for Biology or Biochemistry, Columbia University, New York City, USA
2005	Fritz Lipmann Lectureship, Deutsche Biochemische Gesellschaft, Germany
2005	Datta Lectureship Award, IUBMB
2004	International Award and Medal for Ribosome Research, Meira and Shaul G. Massry Foundation, Beverly Hills, USA
2004	Paul Karrer Gold Medal, University of Zurich, Zurich, Switzerland

2003	Anfinsen Prize, Protein Society, Canyon Country, USA
2003	Medal of Distinction, Israeli Chemical Society, Israel
2002	Harvey Prize for Natural Sciences, Technion, Haifa, Israel
2002	Israel Prize for Chemical Research, Israel
2002	F.A. Cotton Medal, American Chemical Society, USA
2000	Certificate of Distinction, National Institutes of Health (NIH), USA
2000	Kilby International Award, North Dallas Chamber of Commerce, Dallas, USA
2000	First European Crystallography Prize, European Crystallographic Association
1990	I.M. Kolthoff Award for Outstanding Research in Chemistry, Division of Analytical Chemistry, ACS, USA
1974	Somach Sachs Award for Outstanding Work in Biochemistry
1967	Miphal Hapais Prize for Outstanding Graduate Studies
	Member, National Academy of Sciences, USA
	Member, Israeli Academy of Sciences and Humanities, Israel
	Member, European Academy of Sciences and Art
	Member, European Molecular Biology Organization (EMBO)
	Member, Pontifical Academy of Sciences, Vatican City
	Member, American Academy of Art and Sciences, USA
	Member, Korean Academy of Sciences and Technology, South Korea
	Member, International Academy of Astronautics (IAA)
	Member, International Academy for Microbiology
	Fellow, Royal Society for Chemistry, UK

Ada Yonath holds multiple honorary doctorates.

Research Priorities

Structural biologist Ada Yonath is considered a pioneer for her work revealing the structure of ribosomes. In 2009, she was awarded the Nobel Prize in Chemistry together with the British structural biologist Venkatraman Ramakrishnan and the US molecular biologist Thomas A. Steitz. The Nobel Committee honoured her “studies on the structure and function of the ribosome”. Lately, her research has focused on the effects of antibiotics on ribosomes.

Ribosomes are the protein factories of the cell; they consist of hundreds of thousands of atoms, which are divided into two subunits. In protein biosynthesis, ribosomes translate genetic information into proteins, which in turn perform many tasks within an organism. Ada Yonath aimed to find out exactly how this translation process works. She used x-ray structural analysis (or crystal structure analysis) to attempt to determine the exact position of the atoms. However, irradiation with x-rays can only provide a clear picture when the irradiated structures are stable. For a long time, the analysis of ribosomes with x-rays was thought to be futile, as the ribosome crystals were not stable enough to withstand the rays.

Over decades, Ada Yonath worked to develop a method for crystallising ribosomes. She crystallised ribosomes of the thermus thermophilus bacterium, which survives in hot springs and can withstand temperatures of up to 75 degree Celsius. In order to stabilise the crystals, she placed them in a nitrogen deep-freezer. Ada Yonath was able to decode the smaller subunit of the bacterial ribosome and then depict it in a precise three-dimensional image. In the same year, Venkatraman Ramakrishnan and his team succeeded in doing the same thing and Thomas Seitz published the first crystal structure of the larger subunit. The three researchers' discoveries contribute to a better understanding of protein genesis. Their research focuses on a fundamental process of life.

Recently, Ada Yonath has focused on the effects of antibiotics; she has revealed the mechanisms of more than 20 antibiotics. Many of the antibiotic substances latch on to the bacteria's ribosomes and inhibit these. However, the increase in antibiotic resistance is a challenge for medicine. Many substances are no longer effective. Ada Yonath and her colleagues hope that their research will contribute to the development of a new generation of antibiotics. The scientific community is in search of substances which inhibit the protein synthesis of bacterial ribosomes in a more targeted manner, incapacitate pathogens, and cause less resistance.