


# George Emil Palade

<b>George E. Palade</b>	
 <p style="text-align: center; font-size: small;">Dr. George E. Palade won the Nobel Prize in 1974.</p>	
<b>Born</b>	November 19, 1912 Iași, Romania
<b>Died</b>	October 7, 2008 (aged 95)
<b>Citizenship</b>	United States
<b>Nationality</b>	Romanian
<b>Fields</b>	cell biologist
<b>Alma mater</b>	Carol Davila School of Medicine
<b>Known for</b>	Rough ER
<b>Notable awards</b>	1974 Nobel Prize in Physiology or Medicine and the US National Medal of Science in 1986.

**George Emil Palade** (November 19, 1912 – October 7, 2008) was a Romanian-American cell biologist. In 1974, he shared the Nobel Prize in Physiology or Medicine with Albert Claude and Christian de Duve, for discovering the vacuole.

Palade also received the U.S. National Medal of Science in Biological Sciences for "pioneering discoveries of a host of fundamental, highly organized structures in living cells..." in 1986,(National Medal of Science <sup>[1]</sup>), and was previously elected a Member of the US National Academy of Science in 1961.

## Biography

George Emil Palade was born on November 19, 1912 at Iași, Romania; his father was a Professor of Philosophy at the University and his mother was a high school teacher. Both parents strongly encouraged George to further develop his abilities through higher education at university. George E. Palade received his M.D. in 1940 from the Carol Davila School of Medicine of the University of Bucharest, Romania. He was a member of the faculty of that famous school until 1945 when he went to the United States for postdoctoral studies. There, he joined Prof. Albert Claude at the Rockefeller Institute for Medical Research.<sup>[2]</sup>

In 1952, Palade became a naturalized citizen of the United States. He was a Professor at the Rockefeller Institute (1958-1973), Yale University Medical School (1973-1990), and University of California, San Diego (1990-2008). At UCSD, Palade was Professor of Medicine in Residence (Emeritus) in the Department of Cellular & Molecular Medicine, as well as a Dean for Scientific Affairs (Emeritus), in the School of Medicine at La Jolla, California.<sup>[3]</sup> In 1970, he was awarded<sup>[4]</sup> the Louisa Gross Horwitz Prize from Columbia University together with Renato Dulbecco co-winner of 1974 Nobel Prize in Physiology or Medicine "*for discoveries concerning the functional organization of the cell that were seminal events in the development of modern cell biology.*",<sup>[5]</sup> related to his previous research

carried out at the Rockefeller Institute for Medical Research<sup>[6]</sup>. His Nobel lecture, delivered on December 12, 1974, was entitled: "*Intracellular Aspects of the Process of Protein Secretion*"<sup>[7]</sup>, published in 1992 by the Nobel Prize Foundation<sup>[8]</sup>,<sup>[9]</sup>. In 1988 he was elected an Honorary Member of the American-Romanian Academy of Arts and Sciences<sup>[10]</sup> (ARA).

Palade was the first Chairman of the Department of Cell Biology at Yale University. Presently, the Chair of Cell Biology at Yale is named the "George Palade Professorship".

At the Rockefeller Institute for Medical Research, Palade used electron microscopy to study the internal organization of such cell structures as ribosomes, mitochondria, chloroplasts, the Golgi apparatus, and others. His most important discovery was made while using an experimental strategy known as a pulse-chase analysis. In the experiment Palade and his colleagues were able to confirm an existing hypothesis that a secretory pathway exists and that the Rough ER and the Golgi apparatus function together.

He focused on Weibel-Palade bodies (a storage organelle unique to the endothelium, containing von Willebrand factor and various proteins) which he described together with the Swiss anatomist Ewald R. Weibel.<sup>[11]</sup>

Palade is survived by his wife Marilyn Farquhar, a cell biologist at the University of California, San Diego<sup>[12]</sup>.

## Research note: Palade's coworkers and approach in the 1960s

The following is a concise excerpt from Palade's Autobiography appearing in the Nobel Award documents<sup>[2]</sup>

"In the 1960s, I continued the work on the secretory process using in parallel or in succession two different approaches. The first relied exclusively on cell fractionation, and was developed in collaboration with Philip Siekevitz, Lewis Greene, Colvin Redman, David Sabatini and Yutaka Tashiro; it led to the characterization of the zymogen granules and to the discovery of the segregation of secretory products in the cisternal space of the endoplasmic reticulum. The second approach relied primarily on radioautography, and involved experiments on intact animals or pancreatic slices which were carried out in collaboration with Lucien Caro and especially James Jamieson. This series of investigations produced a good part of our current ideas on the synthesis and intracellular processing of proteins for export. A critical review of this line of research is presented in the Nobel Lecture."<sup>[13]</sup>

One notes also that the Nobel Prize in Chemistry was awarded in 2009 to Drs. Venkatraman Ramakrishnan, Thomas A. Steitz and Ada E. Yonath "*for studies of the structure and function of the ribosome*", discovered by Dr. George Emil Palade<sup>[14]</sup>.

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## See also

- Cell biology
- Ribosomes
- RNAs
- Protein synthesis
- Biosynthesis
- Molecular biology
- Biophysics
- Nobel laureates
- "Romanian Scientists", Wikipedia Book PDF, 2010 <sup>[45]</sup>

Roumanian Scientists

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- PDF File of "Romanian Scientists", includes biography of George Emil Palade, Nobel-prize winner.
  - Electron microscopy
  - Photosynthesis
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## External links

- Autobiography written in 1974 for the Nobel Prize <sup>[46]</sup>
- Professor Palade's webpage at University of California, San Diego <sup>[47]</sup>
- George Palade biography Image & Video Library <sup>[48]</sup>
- The Official Site of Louisa Gross Horwitz Prize <sup>[49]</sup>

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- [14] 2009 Nobel Prize in Chemistry ([http://nobelprize.org/nobel\\_prizes/chemistry/laureates/2009/](http://nobelprize.org/nobel_prizes/chemistry/laureates/2009/)), Nobel Foundation
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