Palade George Emil

2008 Nobel pt Fiziologie si Medicina

Acad. Professor Dr. Palade George Emil
19-XI-1912 – 7-X-2008
95 years

Nobel Laureate in Physiology and Medicine - 1974 (while at Yale University, School of Medicine, New Haven, CT. USA), **together with Albert Claude and Christian de Duve. Member of the US National Academy of Science in 1961**.

Biographical notes:

George Emil Palade was born on 19-XI-1912 in Jassy (Iasi – in Moldova, Romania), where he began his education, but continued it with the **Baccalaureate at the "Al Hasdeu" Lyceum in Buzau.** His father, Emil Palade, was a Professor of Philosophy and his mother, Constanta Cantemir-Palade, a teacher, implanting in their son a great respect and love for books, scholarship and education. Since the high school years he was interested in History, especially in Roman history on which he read rather extensively. The Latin language which is often used in historical studies proved useful when he had to generate a few terms and names in cell biology.

As usual, his father wished him to follow in his philosophical steps, but he preferred more practical and tangible work and under the influence of younger relatives, he entered the **School of Medicine of the University of Bucharest (Romania) in 1930.**

Already early in his student years he was **attracted to basic biomedical science, under the influence of Professors of Anatomy - Francisc Rainer - and Biochemistry - André Boivin** - and began to work still as a student in the Anatomy Laboratory, following in parallel all the six years of hospital training in internal Medicine. **His Doctorate thesis was in microscopic Anatomy,** on a rather unusual topic for a M.D.: **the nephron of the cetacean Delphinus Delphi,** attempting to understand the functional adaptation of a mammal to marine life. **He graduated in 1940** and after a short position as Assistant in Internal medicine, he went back to Anatomy.

During the WWII he served in the medical corps of the Romanian Army and after the war, encouraged by **Grigore Popa, Rainer's successor,** left for the **US in 1946 to further his studies.** After a few months of work in **the Biology Laboratory of Robert Chambers at New York University,** he became fascinated by a seminar on electron microscopy of **Albert Claude** and was very happy when Prof. Claude, during a short discussion following the seminar, asked

him to work with him at **the Rockefeller Institute for Medical Research** in the fall of the same year, a welcome opportunity, as Prof. Chambers was retiring that summer.

At The Rockefeller Institute, **Claude** was working **in the Department of Pathology of James Murphy** with **George Hogeboom** and **Walter Schneider** as direct collaborators at a "sucrose method" for the homogenization and fractionation of liver tissue, but the group dismembered soon, each returning to their former places and Palade remained only with Porter, for two years, when Murphy retired as well and they were adopted by Herbert Gasser, then the Director of the Institute.

Around that time, he worked also in **electron microscopy,** in order to develop preparation procedures applicable to organized tissue. Using the available techniques, Palade and Porter worked out some improvements in microtomy and tissue fixation to obtain preparations which, for the moment, appeared satisfactory and gratifying. The electron microscopy proved to be applicable practically to all eukaryotic cells. **With Porter**, he investigated the local differentiations of the endoplasmic reticulum and with **Sanford Palay** they worked out the fine structure of chemical synapses. With all this activity, the laboratory became reasonably well known and started functioning as a training center for biological electron microscopy, becoming quite secure regarding research funds and independent in selecting their targets and excellent collaborators.

In the middle 1950's, Dr. Palade went back **to cell fractionation,** to define the chemical composition and the functional role of the newly discovered subcellular components, using electron microscopy for monitoring cell fractionation. Together with **Philip Siekevitz** they showed that Claude's microsomes were fragments of the endoplasmic reticulum (as postulated by Claude in 1948) and that **the ribosomes were ribonucleoprotein particles.**

In the 1960s Prof. Palade [1] was working in collaboration with **Philip Siekevitz, Lewis Greene, Colvin Redman, David Sabatini and Yutaka Tashiro,** on the secretory process, using two different approaches:

1 - The first relied on cell fractionation and led to the characterization of the zymogen granules and the discovery of the segregation of secretory products in the cisternal space of the endoplasmic reticulum.

2 - The second approach, carried out in collaboration with **Lucien Caro and James Jamieson,** relied primarily on radio-autography, and involved experiments on intact animals or pancreatic slices [2].

In 1961 cell biology became a recognized field of research in biological sciences and the Journal of Cell Biology and the American Society for Cell Biology were founded. Their group participated actively in each of these developments.

In 1973, he left the Rockefeller University to join the Yale University Medical School, to better connect the new discipline of **Cell Biology** with the traditional fields of interest of medical schools, namely **Pathology and Clinical Medicine.** At that time there were at least five other laboratories working in different sectors of cell biology.

These researches led to the ideas on the synthesis and intracellular processing of proteins for export and

The Nobel Prize in Physiology or Medicine 1974, shared by: Albert Claude, Christian de Duve, George E. Palade.

Dr. Palade has been a member of the National Academy of Sciences (U.S.A.) since 1961, and he has received awards and prizes for his scientific work, among them**: the Lasker Award**

(1966), the Gairdner Special Award (1967), and the Hurwitz Prize - shared with Albert Claude and Keith Porter (1970).

Prof. Dr. Palade had a daughter, **Georgia Palade Van Duzen**, and a son **Philip Palade** from a first marriage with Irina Malaxa, now deceased. In 1970 he married Marilyn Gist Farquhar, a cell biologist like himself. George E. Palade **died on 7 October, 2008.**

In 2009, the Nobel Prize in Chemistry, was awarded to Drs. **Venkatraman Ramakrishnan, Thomas A. Seitz** and **Ada E. Yonath** "for studies of the structure and function of the ribosome", discovered also by **Dr. George Emil Palade** [3].

Bibliography:

1. ↑http://www.nobelprize.org/nobel_prizes/medicine/laureates/1974/palade.html Autobiography by George Emil Palade.
2. ↑ http://www.nobelprize.org/nobel_prizes/medicine/laureates/1974/palade-speech.html Dr. George Emil Palade's Nobel Lecture.
3. MLA style: "George E. Palade - Biographical". *Nobelprize.org*. Nobel Media AB 2014. Web. 16 Nov 2014. http://www.nobelprize.org/nobel_prizes/medicine/laureates/1974/palade-bio.html
4. ↑ 2009 Nobel Prize in Chemistry, Nobel Foundation.
5. ***Les Prix Nobel*** *en 1974*, Editor Wilhelm Odelberg, [Nobel Foundation], Stockholm, 1975.

This autobiography/biography was written at the time of the award and later published in the book series ***Les Prix Nobel/Nobel Lectures/****The Nobel Prizes*. The information is sometimes updated with an addendum submitted by the Laureate.

6. http://www.rockefeller.edu/nobel.html
7. Weibel ER, Palade GE. "New cytoplasmic components in arterial endothelia". J. Cell. Biol. 1964, 23: 101-112). http://www.jcb.org/cgi/content/abstract/23/1/101
8. 10.1172/JCI37749 Obituary: "A tribute to George E. Palade" by James D. Jamieson, November 8, 2008
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