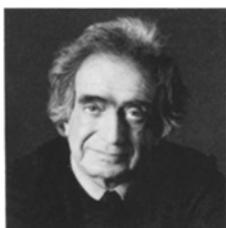


E. B. WILSON MEDALISTS, 1981

Daniel Mazia's career in research encompasses many areas of cell biology, but the main thread is a fascination with how cells reproduce. Much of this effort is directed toward understanding the regulation and structural basis of mitosis. His studies include landmark work on calcium levels and fertilization, growth during the cell cycle, studies on the role of the cell nucleus in directing cell growth, the first experimental dissection of the centriole cycle during cell replication and, of course, the classic feat of isolation of the mitotic apparatus from sea urchin eggs. This accomplishment demonstrated that this labile, ephemeral structure was a distinct entity composed of vesicles and microtubules that could be analyzed *in vitro*. This advance has led to much of our present understanding about the structural and physiological basis of chromosome movement.



In recent years, Daniel Mazia's attention has been directed toward the initiation of mitosis by fertilization. His contribution to the alkalization hypothesis of cell activation has contributed to the rejuvenation of interest in this area. His current effort is focused on the question of the origin of the centrosome.

Daniel Mazia, a gifted teacher, whose famous cell biology course at Berkeley assimilated his philosophy of science to impart a personal view of the cell, has taught and lectured at Berkeley for 30 years, for several summers at the Marine Biology Laboratory, Woods Hole, and now at the Hopkins Marine Station.

Dr. Mazia is currently at the Hopkins Marine Station. He is a Professor of Biological Sciences at Stanford University and a Professor Emeritus of Zoology at the University of California, Berkeley.

George E. Palade's impressive record of achievement has provided us with fundamental knowledge in cell biology we now take for granted. At the beginning of the current era of cell biology, his thorough analysis of the factors that influence the preservation of ultrastructure contributed to the multifaceted effort that made thin section analysis possible. His description of mitochondrial ultrastructure proved to be the first display of his etymological talents as he introduced the term "cristae mitochondriales."

The discovery of the ribosome ("Palade's particle") in situ led to the magnificent series of studies which elucidated the cellular events associated with protein synthesis and secretion in exocrine cells, and resulted in Dr. Palade's being awarded the Nobel Prize. These studies form a model for biological



investigation ranging from the whole organism to the molecule. Palade and his distinguished international group of students and collaborators conducted experiments on the cellular basis of protein synthesis which united biochemical, physiological, and morphological analysis to provide an integrated structural-functional, qualitative-quantitative interpretation of cellular activity. The barriers that had long divided biochemists, morphologists, and physiologists were progressively eroded by this fruitful and exciting research effort. As subject matter came together, investigators of different disciplines united their expertise in a manner quite unprecedented in the history of biology. Cell fractionation data could now be interpreted in relation to the organization of the intact cell. This synthesis of multiple technical approaches to analysis of cell systems is an achievement of the highest order.

Dr. Palade is currently at the Yale University School of Medicine, where he is Professor and Chairman of the Section of Cell Biology.

Keith R. Porter's pioneering spirit first became manifest in 1945, with his publication of the first interpretable image of a cell ever seen with the electron microscope. A cytoplasm membrane system, later to be called the endoplasmic reticulum, was glimpsed for the first time by Porter in the attenuated margin of a tissue culture cell. Further characterization of the endoplasmic reticulum was dependent on the development of the thin section technique for ultrastructural analysis of intact cells. Here Porter's contribution to the development of a practical ultramicrotome in 1953 was the technical achievement that made the resolving power of the electron microscope available to investigators. His emphasis on technical innovation has promoted the use of scanning and high voltage electron microscopy for study of the cell. His breadth of interest in animal and plant cells led to the original ultrastructural descriptions of the diversity of form in the endoplasmic reticulum as well as of cilia, coated vesicles, autolysosomes, microtubules, and microtrabeculae.

Keith Porter's scientific achievements and contributions to cell biology originate from his uncanny ability to recognize opportunities for advancement in knowledge and to set a pattern of analysis in a new area. Central to Porter's effectiveness is his ability to communicate easily with colleagues at all levels. His ability to present complexities in a straightforward way has brought him recognition as a distinguished teacher at Harvard and at the University of Colorado.

Dr. Porter is currently at the University of Colorado, where he is Distinguished Professor Emeritus in the Department of Molecular, Cellular, and Developmental Biology.



E. B. WILSON MEDALISTS, 1982

Charles Philippe Leblond's research career places him among the pioneers in cell biology. Leblond and his collaborators undertook the first use of synthetic radioactive isotopes in the localization of labeled molecules within tissues by the techniques of radioautography, a method that he developed and perfected. His early studies, which investigated the dynamic processes taking place within tissues and cells, rapidly led to the now generally accepted view that cellular components and cells of many tissues undergo renewal at various rates. Extending this use of radioactive tracers to the ultrastructural level, he tackled a variety of problems which are still under active investigation. These included studies on the intracellular compartments involved in secretion as well as the demonstration by electron microscope radioautography of a basic similarity among all cells in the incorporation of proximal sugars at the level of the endoplasmic reticulum but of terminal sugars at the level of the Golgi apparatus. This work provided the first demonstration of a division of labor between the endoplasmic reticulum and Golgi apparatus in the biosynthesis of glycoproteins.



Charles Leblond's most recent research interests have focused on the renewal of basement membrane constituents. This interest can be traced back to his classic work on the elaboration of collagen by the highly polarized odontoblast. It was from this work that the role of the Golgi apparatus in packaging collagen was delineated. Currently, using the techniques of light and electron microscope immunocytochemistry, Charles Leblond and his colleagues are engaged in mapping the distribution of the molecular constituents of a variety of basal laminae as well as determining the cellular organelles involved in the elaboration of basal lamina constituents.

Dr. Leblond is currently at McGill University, where he is a Professor in the Anatomy Department.

Alex B. Novikoff's research has been characterized by his interest in integrating biochemical and microscopic information; his fluency with a diversity of cell types and problems; and his sense of the continuities among normal material, pathological, and experimentally altered tissues and developing systems. His scientific achievements are numerous. Chromologically, we know him best for his investigation of the heterogeneity of rat liver particles which culminated in the morphological identification of lysosomes, involving collaborative studies with Christian de Duve, and for his creative use of histochemistry at the ultrastructural level to uncover and to localize new enzymatic activities. He elevated cytochemistry to a respectable and acceptable way of contributing to cell exploration. Among his other contributions are the characterization of a liver tumor, the Novikoff hepatoma; the introduction of the nucleoside diphosphatase technique as a marker for the Golgi complex; the development of a cytochemical technique for detecting microbodies or peroxisomes; and, most recently, the introduction of the concept of GERL.



Alex Novikoff has been an effective member of the societies to whose growth and activities he has contributed, especially the American Society for Cell Biology, of which he is past president. The *Journal of Cell Biology* and the *Journal of Histochemistry and Cytochemistry* have been enriched and guided by his untiring efforts as an editor, reviewer, and contributor. His laboratory at Einstein, where he has been since 1955, has been a training ground for many productive cytochemists and other cell biologists who either came for postdoctoral training or were attracted to the program in experimental pathology he helped develop.

Dr. Novikoff is currently at the Albert Einstein College of Medicine, where he is Research Professor in the Department of Pathology.