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Charles Philippe Leblond
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Charles Philippe Leblond, M.D. (Paris), Ph.D. (Université de Montréal), D.Sc. (Sorbonne), died on 10 April, 2007 in Montreal at the age of 97 years, after serving for more than six decades as Professor of Anatomy at McGill University. "CP" Leblond was born in Lille, France on 5 February, 1910 and received his M.D. from the University of Paris in 1934. After a post-doctoral period at Yale University, where he met his wife Gurtrude, to whom he was married for 64 years. Leblond then returned to the Laboratoire de Synthèse Atomique in Paris. His early work in this laboratory, using radioactive isotopes, was to set the stage for his future contributions which would revolutionize our understanding of the dynamic nature of tissues and cells.

Our modern concepts of cell biology acknowledge that virtually all cells in the body continuously synthesize a multitude of proteins, and we have a basic understanding of the pathways of synthesis and secretion of these proteins. It is also understood that there is a continuous turnover of cells in many tissues, and embryonic and adult stem cells play a central role both in the cellular economy and in malignant transformation. Neither of these concepts was appreciated at the beginning of Leblond's career, and his extraordinary contributions to these fields have fundamentally changed our concepts of cell biology.

After fleeing France with his family in 1940, Charles Leblond came to McGill University to join the Department of Anatomy. During his tenure as chairman from 1957-1974, the department became one of the world's top research facilities in cell biology and microscopy. At the same time, he paid special attention to fostering a collegial and social atmosphere in the department, and all members including faculty, graduate students, post-doctoral fellows and technical employees were frequently welcomed in his home by his wife and four children.

At McGill, Leblond pioneered the use of the technique of autoradiography in which a photographic film is applied to histological sections (in darkness) in order to determine the location of radioactive molecules in cells and tissues and then to trace their intracellular pathways over varying periods of time. The first dramatic results of this technique were achieved using 3H-thymidine as a marker for newly dividing cells which had incorporated this label in their nuclei. The findings indicated that in many tissues, there was a rapid turnover of cells. The cells of the small intestine, for example, were reported to be replaced every two days - a concept originally dismissed by critics as "too silly for words". To maintain this renewal, these tissues contain a population of adult stem cells which divide to produce the differentiated cells as well as to maintain their own number.

The autoradiographic technique was then used to investigate the pathways of synthesis and secretion of proteins using 3H-amino acids. Contrary to the established concepts of the time, it was shown that nearly all cells synthesized proteins continuously. In pancreatic acinar cells, as well as many other cell types, autoradiographic results at both the light and electron microscopic levels, indicated that the labeled proteins were synthesized in the rough endoplasmic reticulum, migrated to the Golgi apparatus, and then were often carried by secretory granules to the extracellular space. But the Golgi apparatus had a more significant role than just packaging secretory products. Using 3H-glucose and 3H-galactose, autoradiographs of intestinal Goblet cells showed that the Golgi apparatus was the site of addition of sugar residues to the O-linked carbohydrate side chains of mucous glycoproteins. Studies using 3H-mannose revealed, on the other hand, that in the synthesis of N-linked side chains in many other cell types, the addition of sugars was initiated in the endoplasmic reticulum and completed in the Golgi apparatus. In

animals sacrificed at later time intervals, labeled glycoproteins were documented to migrate not only to secretion granules but also to lysosomes and different regions of the cell surface membrane.

Charles Leblond was fondly remembered by generations of students as a superb teacher. He trained a long list of Ph.D. students, many of whom went on to distinguished academic careers in their own right. Leblond continued his active research long after retiring as chair, first as a Fogarty Scholar at NIH, and then for three more decades at McGill. He continued to attend all departmental seminars and to challenge speakers with stimulating questions well into his 90's. His last publication in 2007 marked a total of 430 scientific papers, many of them still frequently cited today.

In recognition of his achievements, Charles Leblond received many honorary degrees as well as numerous awards including Fellow of the Royal Society of Canada (1951), the Flavelle Medal (1961), the Medal Leo Pariseau (1965) the International Gairdner Foundation Award (1965), fellow of the Royal Society of London (1965), honorary member of the American Academy of Arts and Sciences (1970), National Institutes of Health Fogarty Scholar (1975), Officer of the Order of Canada (1977), the Henry Gray Award of the American Association of Anatomists (1978), the Wilson Medal from the American Society of Cell Biology (1982), the McLaughlin Medal (1983), the Quebec Government's Prix Marie-Victorin (1992), induction into the Canadian Medical Hall of Fame (1995), the prestigious Companion of the Order of Canada (1999), and Grand Officer of the National Order of Quebec (2001).

Charles Leblond was a pioneer who, in the face of all current dogma, provided dramatic evidence for the continuous dynamic turnover of cells as well as for the dynamic nature of components in all cells. He was among the very first to introduce the time dimension into the previously static concepts of histology and cell biology. Finally, he will be remembered personally as an extraordinary individual who shared his intellectual journey with many trainees and collaborators, all of whom held him in the highest esteem and whose lives were changed by the extraordinary opportunity to have worked with him.

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