

## VIEWPOINT

# Hector F. DeLuca, Ph.D.: Steenbock Research Professor and Chairman, University of Wisconsin, Madison

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The DeLuca Symposium on Vitamin D was held on June 15–19, 2002, in Taos, New Mexico, to honor and celebrate Professor DeLuca's legacy in vitamin D research and his definitive studies 30 years ago that resulted in identifying  $1\alpha,25$ -dihydroxyvitamin  $D_3$  as the biologically active secosteroid hormone of vitamin D. The success of this meeting was made possible by generous contributions from the sponsors that included Abbott Laboratories, Bone Care, Brown University, Chugai Pharmaceuticals, the University of New Mexico and the Wisconsin Alumni Research Foundation. Articles contained in this issue of the *Journal of Cellular Biochemistry* reflect the depth and quality of research that has resulted in large part from the foundational studies conducted in Dr. DeLuca's laboratory over the past 40 plus years. A brief synopsis of Professor DeLuca follows.

A Northern migration from High School in Pueblo Colorado to the University of Colorado in Boulder and subsequently to Madison and the University of Wisconsin in 1951 resulted in the beginning of Hector DeLuca's graduate studies in Biochemistry under the tutelage of Professor Harry Steenbock. During this period, Dr. DeLuca was introduced to the multifactorial challenges attendant with understanding the biochemical nuances of vitamin D, which resulted in the dedication of his professional career to understanding the cellular and molec-



ular actions of vitamin D and its secosteroid metabolites. In 1959, Dr. DeLuca assumed an Assistant Professorship in Biochemistry and was promoted as full professor in 1965 when he was awarded the Steenbock Research Professorship that he still retains. Professor DeLuca was made chairman of the Department of Biochemistry in 1970 and held that post until 1986. He resumed Chairmanship of Biochemistry in 1991 and remains in that capacity.

Professor DeLuca is credited with first recognizing that vitamin D is biologically inactive and must be converted to metabolically active forms before it functions. His group then carried out the chemical isolation and identification of all of the active forms of vitamin D, including  $1\alpha,25$ -dihydroxyvitamin  $D_3$ . His group is also credited with describing the vitamin D-endocrine system based in the proximal convoluted tubule cells of the kidney. This work led further to the demonstration of the existence of a receptor for the biologically active form of vitamin D,  $1\alpha,25$ -dihydroxyvitamin  $D_3$ . In 1987, the DeLuca group and the O'Malley, Pike, and Haussler groups independently

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cloned the vitamin D-receptor transcription factor. Throughout all of this work, Professor DeLuca has kept a chemical synthesis group active in the production of analogs of the active form of vitamin D and their application to the treatment of disease. As a result of his work and that of others, the active form of vitamin D and its analog,  $1\alpha$ -hydroxyvitamin  $D_3$ , have been used extensively for the treatment of bone disease associated with kidney failure, vitamin D-resistant rickets, hypoparathyroidism, and osteoporosis. With demonstration of the vitamin D receptor in unexpected target tissues, the DeLuca group has moved to describe new functions of vitamin D in the immune system and the parathyroid glands in which new and unexpected functions of the vitamin D hormone have been documented.

Over 150 United States patents and greater than 1,200 European and foreign counterparts are credited to Professor DeLuca. His group has been responsible for the development of eight drugs marketed worldwide. Professor DeLuca's research has spanned the area of organic chemistry, molecular biology, physiology, pharmacology, endocrinology, and clinical medicine.

Professor DeLuca's work has been recognized by numerous awards, especially membership in the American Academy of Arts and Sciences, the National Academy of Sciences, the Gairdner Foundation Award, the Roussel Prize, the Eli Lilly Prize, the Nevada Medal, the 3M Life Sciences Award of FASEB, the William Rose Award of the American Society of Biological Chemists, the Mead Johnson Award, the Osborne Mendel Award, and the Atwater Medal of the American Institute of Nutrition, and several other international awards. Professor DeLuca has over 1,070 research publications and has trained in the neighborhood of 200 graduate students and postdoctoral fellows. He has received honorary doctorate degrees from the Karolinska Institute in Stockholm, Sweden, the University of Colorado, and the Medical College of Wisconsin. Professor DeLuca has

served as a member of the Food and Nutrition Board of the National Academy of Sciences, the Strategic Planning Council of the NIH, and Study sections of the NIH and March of Dimes. He is currently a member of the U.S.–Japan Nutrition Study Panel.

A native of rural Colorado near Pueblo, Professor DeLuca received his Bachelor's degree in Chemistry with Honors at the University of Colorado, his Masters and his Ph.D. degrees from the University of Wisconsin, Department of Biochemistry, and spent a year studying tissue culture with Honor Dame B. Fell in the Strangeways Research Laboratory in Cambridge, England. His love for life in the country continues in that he resides on a 40-acre farmland in the east of Madison and has four children by his previous marriage and a son and a daughter by his current wife. His interests in vitamins A and D, calcium, phosphorus, parathyroid hormone, and calcitonin clearly points to his interest in the nutritional sciences.

Comments from people who went through Professor DeLuca's laboratory reflect upon his ability to attract energetic and bright scientist, his continual encouragement to challenge current dogma, his ability to talk about what anyone in the laboratory was doing at any given moment and to have at his fingertips the relevant work from the literature. Also noted was his ability to function as a catalyst, set long-term goals and know when to stop and report the findings. Further thoughts recalled his ability to generate a month's worth of new experiments after just a few moments of looking at data. Laboratory members defined the 70s period as a brain-storm phenomenon that had endocrinologists, nutritionists, and enzymologists vying for a part of  $1,25$ -dihydroxyvitamin  $D_3$  as their own. Collectively, Hector Deluca is pictured as an individual who has the aptitude and intellect to sense and solve mysteries of science in a manner that spans generations and contributes to the ever expanding circle of knowledge and reason.