

Robert M. Russell, MD

Director

USDA Human Nutrition Research Center on Aging at Tufts University

Robert M. Russell, M.D., is a Professor of Medicine and a Professor of Nutrition at Tufts University. He is also a Senior Scientist and Director of the USDA Human Nutrition Research Center at Tufts University. He received his B.A. at Harvard University and his M.D. from Columbia University. He completed his internship, residency, and fellowship in gastroenterology at the University of Chicago. Dr. Russell has been engaged in vitamin A and carotenoid research since 1972 and was the first to document vitamin A deficiency as a subclinical problem in patients with chronic gastrointestinal disease. Dr. Russell presently serves as a staff physician at the New England Medical Center in Boston.

An internationally recognized expert on the nutritional needs of older adults, Dr. Russell has published more than 250 scientific papers, 40 reviews, 50 chapters and monographs, and three books. He is a co-editor of Volumes 8 and 9 of Present Knowledge in Nutrition, and editor-in-chief of *Nutrition Reviews*.

Dr. Russell is a member of many health professional organizations, including the American College of Physicians, the American Gastroenterological Association, and the American Society for Nutrition (ASN). Dr. Russell has served as Chair of the Food and Nutrition Board of the Institute of Medicine (National Academy of Sciences) and as Chair of the Dietary Reference Intake Panel for Vitamin A, Vitamin K, and Trace Metals. Dr. Russell is past President of the American Society of Clinical Nutrition from 2002-2003, and is currently Vice President of the ASN. He served on the editorial boards of numerous scientific journals, including the American Journal of Clinical Nutrition, Age and Nutrition, the Tufts Health and Nutrition Newsletter, and was on the Board of Trustees of the International Life Science Institute. Dr. Russell has served as Chair of the U.S. Department of Agriculture's Human Subjects Research Committee, Chair of the United States National Committee to the International Union of Nutritional Sciences, and as a member of the Food and Nutrition Board's 1998 Panel on Folate, B Vitamins and Choline. He also has served on many national and international advisory panels, including The World Health Organization, UNICEF, the FDA, the NIH, the United States Pharmacopeia, the National Digestive Diseases Advisory Board, and the American Board of Internal Medicine. He has worked on international nutrition programs in several countries including Vietnam, Iran, Iraq, Guatemala, China, and the Philippines. He is a staff physician at the Tufts Medical Center.

Dr. Russell has received numerous awards and honors, including the Grace A. Goldsmith Award from the American College of Nutrition, the Ethyl Austin Martin Distinguished Lecturer in Human Nutrition Award, the Robert H. Harman Award of the American Society of Clinical Nutrition, the DSM Human Nutrition Award, and the David Kritchevsky Career Achievement Award of the ASN.

Dr. Russell's research career has centered on retinoid and carotenoid metabolism. He and his team delineated an excentric cleavage process for beta carotene to explain the biosynthesis of retinoic acid by beta-apo-carotenoic acids, both in vitro and in vivo. These studies laid the groundwork for investigating the mechanistic role of carotenoids in carcinogenesis. Indeed, by subsequently establishing the ferret model for lung carcinogenesis, Dr. Russell's team delineated molecular pathways, at the level of receptors and in signal transduction, underlying the observation that high dose supplementary beta carotene in two human intervention trials resulted in increased lung cancer. In the team's work, the most advanced techniques of stable isotope biology have been applied for determining the human conversion of carotenoid precursors to vitamin A from different dietary sources. Dr. Russell and colleagues have grown food with stable isotope labels so as to be sure the metabolic investigations are relevant to real life settings in the field. The application of such work to the understanding of worldwide approaches to vitamin A deficiency using food sources of pro vitamin A carotenoids is immeasurably important.

Over the last several years, Dr. Russell's group has been actively engaged in developing assays to measure the true total antioxidant performance capacity of human plasma and tissue. Using an assay which employs a lipophilic free radical generator and probe, they've been able to demonstrate antioxidant activity of lipophilic antioxidants which are not picked up by using the more conventional TRAP, FRAP, and ORAC assays. The new assay's strength lies in the fact that it measures not only lipophilic antioxidant activity in a lipophilic system, but also that it is also able to measure synergistic interactions between the antioxidants in both the lipophilic and hydrophilic phases of plasma. Such interactions were not previously picked up by hydrophilic based assays. The team has shown that the antioxidant performance is in large part influenced by the dose of the antioxidant present, in that high concentrations actually reduce antioxidant performance. Thus, this assay offers enormously high potential for use as a biomarker in prospective epidemiologic and intervention studies.