

BIOGRAPHY

Tapan K. Basu

Dr. Tapan Basu, a native of India, was born in Seharabazar, a small town in the province of West Bengal. At the age of 23, Dr. Basu immigrated to the United Kingdom in 1963; at that time he had Bachelor of Science and Bachelor of Veterinary Medicine degrees from the University of Calcutta. He continued his studies, obtaining a Master's degree in Human Nutrition and a Master's degree in Biochemistry from the University of London in 1966 and 1968, respectively. Subsequently, Dr. Basu obtained his PhD degree in Biochemistry from the University of Surrey in 1971. Upon receiving his doctorate degree, Dr. Basu accepted a position as Head of Metabolic Unit, Institute of Oncology (then Marie Curie Memorial Foundation), Oxted, Surrey. He became actively involved in research on the nutritional status of cancer patients and on metabolic aspects of cytotoxic drugs. From 1972 to 1975 he also held a concurrent position as an Associate Lecturer in Nutrition at the Department of Biochemistry, University of Surrey. In 1975, Dr. Basu joined the department as a full-time lecturer in Nutritional Biochemistry. In 1981, he accepted a position as Associate Professor at the Department of Foods and Nutrition, University of Alberta, Canada and was promoted to full Professor in 1983.



Dr. Basu's earlier research had focused on the metabolism of vitamins, particularly retinol, ascorbic acid and thiamin. He had studied the relationship of these vitamins with malignant diseases. Highlights of his work include:

- a) establishing a link between biochemical evidence of secondary deficiency of vitamin A due to its metabolic unavailability and cancers of the epithelial cell origin, such as bronchus, lung and endometrium in humans [1-5];
- b) determining an association between breast cancer, especially with skeletal metastases and ascorbic acid deficiency as well as providing mechanistic beneficial effects of ascorbic acid supplement to these patients [6, 7]; and
- c) investigating the thiamin antagonistic effect of 5-fluorouracil (a widely used cytotoxic agent) on malignant disease [8-10]. In the year 1984, the Canadian Society for Nutritional Science recognized Dr. Basu's fundamental research contributions in the relationships between nutrition and cancer by honoring him giving a prestigious Annual Borden Award. This is a national award which honors a scientist of 45 years of age or younger for outstanding research in human nutrition.

Dr. Basu's research on various aspects of ascorbic acid is well known. In particular, his extensive reports against its megadose usage have been considered to be fundamental and have received much attention [11-15]. He had written a whole text pointing to the fact that ascorbic acid intake should not exceed 200 mg/day (Basu TK and Schorah, CJ: vitamin C in Health and Disease, AVI Pub, Connecticut, 1982). Indeed during 80s, Dr. Basu had been invited along with double Nobel Laureate Linus Pauling to deliver plenary lectures and serve panel discussions on the facts and fallacies of mega vitamin use in numerous scientific meetings, held in South America, North America, and Europe. Professor Pauling's passion for mega vitamin use as panacea is well known.

Dr. Basu's work on diabetes in more recent years, is another break through in nutrition research. He was first to report that type 1 diabetes (T1D) is associated with impaired metabolic availability of vitamin A due to its decreased hepatic hydrolysis as well as the synthesis of its carrier protein and that this secondary deficiency of the vitamin is linked to diabetes-related retinopathy [16-25]. The subnormal vitamin A status in poorly controlled diabetic subject does not seem to respond to vitamin A supplementation, rather it increases its load in the liver leading to hepatotoxicity [26]. The treatment with insulin reverses the abnormal serum vitamin A homeostasis. From nutritional standpoint, however, supplementation with zinc (a trace element, required for the synthesis of Retinol-binding protein) appears to be important in preventing metabolic abnormality of vitamin A in T1D.

Over the centuries, we have come a long way from vitamin era to functional food era. Dr. Basu's research has also moved with the era. Thus over the last 15 years or so, his research focused more and more on phytochemicals with particular emphasis on antioxidants, dietary fiber, and other plant factors in health and disease. Clinical efficacy of Natural Health Products (NHPs) of plant origin is often limited and variable. This is likely due to extracts used not being standardized. The roots, flowers, stems, leaves, and seeds of a plant could be used in a product either in isolation or collectively, and called an 'extract'. The chemical constituents, however, can differ quantitatively and qualitatively between different parts and sometimes different species of a plant. There also exist multiple biologically active components in a plant that work synergistically. It is essential that these components are present in a product in their optimal amounts and proportions for the best effective clinical outcome. Because of these complexities, a clinical study design for a natural health product, meeting all criteria, becomes a challenge. Dr. Basu's research addressed these complex issues and provided critical evaluations of the validity of their clinical efficacy claims, and described an approach to a randomized, double-blind placebo-controlled clinical trial, which were designed taking into account the complexities that are involved in NHPs. The plants (and their products) that he investigated include germinated wheat [27],

rhubarb (*rheum rhaponticum*) [28-30], echinacea (*purpurea*) [31-33], fenugreek (*trigonella foenum-graecum L.*) [34, 35], and North American ginseng (*panax quinque folium*) [36-38].

Dr. Basu has been the author of nearly 200 research publications, most of which are in the areas of vitamins and phytochemicals relating human health and disease. He has also written or edited a number of reference texts, which include "Vitamins in Human Health and Disease", "Vitamin C in Health and Disease", "Drug-Nutrient Interactions", "Antioxidants in Health and Disease", and "Clinical Implications of Drug Use, Volumes 1 & 2". The University of Alberta has recognized Dr. Basu's enormous life-long contributions in human nutrition by honoring him with the prestigious titles: McCalla Research Professorship (1993) and Killam Annual Professorship (1997). He is a fellow member of the American College of Nutrition as well as the International College of Nutrition. Dr. Basu has been invited to present his research work at numerous international scientific meetings, involving Asia, Australia, Europe, North America, and South America. He served as the President of the International College of Nutrition for many years, and currently he is the Executive Director of the college. This college has achieved an international recognition just because of his dedicated efforts.

Dr. Basu's life-time research work has, no doubt, earned him to be a world's leading expert in micronutrients and phytochemicals. His novel research has made a true impact in our understanding of the role of these factors on health and disease. Dr. Basu has also been a dedicated teacher. In addition to his undergraduate teaching, he has supervised numerous master's and doctoral students and served as a member of many supervisory and examining doctoral thesis committees in his own as well as other national and international universities. He trained his students in all the skills of research so as to prepare them for their future challenges. Many of his graduate students have gone on to achieve much success. His contribution as a teacher and researcher is indeed outstanding. Dr. Basu is currently a Professor Emeritus of Nutritional Biochemistry at the Department of Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life and Environmental Sciences, University of Alberta.

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