

P. R. Adiga (1935–2006)

Perudur Radhakantha Adiga was born on 5 May 1935 into a priestly, orthodox family, in a small village, Barkur, South Kanara, then part of Madras Presidency. He was one of ten siblings. He had his early schooling in the temple town of Udupi, Karnataka and this shaped his personality to a very large extent. Adiga passed away suddenly of cardiac arrest on 13 September 2006.

Adiga obtained M Sc degree from University of Kerala and Ph D from the Indian Institute of Science (IISc), Bangalore in 1963, working at the Department of Biochemistry under the supervision of the late P. S. Sarma. He elucidated the interrelationships of trace elements and metal toxicity on growth and intermediary metabolism of fungi and insects. During this time, he initiated work on the unusual amino acid, *N*-oxalyl-diaminopropionic acid, neurotoxin present in *Lathyrus sativus*. The group demonstrated by elegant experiments that this compound was responsible for the debilitating neurological disease, neurolathyrism, prevalent in large tracts of North India. This was a seminal contribution in establishing the link between an unusual amino acid and brain function. He also discovered a new amino acid, homoarginine. L. K. Ramachandran and A. N. Radhakrishnan inspired him and enabled Adiga to sharpen his experimental skills and scientific thinking. In recognition of his excellent contributions, Adiga received the Giri Memorial Medal for the best Ph D thesis submitted to the Indian Institute of Science in 1963.

Adiga carried out his post-doctoral work at the University of Hawaii, Honolulu, USA with T. Winnick and at the McGill University, Montreal, Canada. In Honolulu, he worked on the hormones of the anterior pituitary, and at Montreal on the effect of thyroid-releasing hormone and LATS on the pituitary and of thyroid-releasing hormone on the thyroid. This led him into the elegant studies on the role of cAMP on hormone release as well in transcription and translation in target tissues on which the hormones act. This work made a significant impact on our understanding of the mechanism of hormone action.

Adiga had an intense desire to return to India and build his career in our coun-

try. This commitment was evident when he accepted the position of a Senior Research Fellow at the Department of Biochemistry (IISc), while several of his contemporaries held faculty positions. The facilities available to all of us were primitive and financial support meagre. He accepted this as a challenge and initiated innovative programmes of work. His early work on the biosynthesis and hormonal regulation of polyamines in plants reflected an incisive mind and an extensive knowledge on interrelationships of metabolic pathways, laying the foundation of the area known as metabolic engineering today. His contributions are evident in the invited review he published in the *Journal of Plant Growth and Regulation*.



Adiga and a small group of scientists recognized at this time the importance and national relevance of work on human reproduction. They recognized that valuable information can be obtained using good model systems. At that time there was an explosion of knowledge on the regulation of gene expression by steroid hormones, especially the molecular aspects of the biosynthesis of estrogen-induced egg-protein in the chicken, vitellogenin. Adiga was attracted by the observation that riboflavin-binding protein (RCP), which was present in both the egg white and yolk, may have a function in reproduction. This was indicated by the observation that hens deficient in this protein were able to lay eggs, but these

eggs failed to hatch. Adiga marvelled at the mechanism adopted by nature in providing all the nutrients required for development of the avian embryo, outside of the maternal system control. This problem appeared to pose many challenges. Here was a protein, which was hormonally modulated, appeared to be essential for embryonic development, and most importantly, not in the beaten track. For the rest of his life, during active service and more vigorously after retirement he pursued his studies on RCP along the evolutionary tree – from the chicken to the mammal, biochemical and biophysical properties, function in foetal development, structure correlated to immunological function, etc. He identified many other vitamin-carrier proteins, elucidated their biological function and hormonal regulation.

In early 1980, he was posed a challenge, 'chickens are chickens, move on mammals'. He rose to the challenge and characterized the protein in rodents and primates. He showed the requirement of RCP in mammalian reproduction and suggested the development of a novel immuno-contraceptive, using RCP as a vaccine for the development of antibodies in the female, which could effectively block the action of the maternal protein. This led him logically into a study of the molecular immunology of these proteins using peptides and monoclonal antibodies. Even after retirement from IISc, Adiga continued his research interests to define the immunotopology of RCP. Using modern molecular immunological and biological techniques, his group identified stretches of amino acid sequences that could effectively replace the entire molecule as contraceptive vaccine. Even with a reduced research group, Adiga's list of publications post-retirement is outstanding in terms of impact factor and numbers.

He retired after 25 years of service in the Department of Biochemistry, IISc where he climbed the ladder from the position of research assistant-cum-student to that of Professor. He accepted to build and nurture the Centre for Reproductive Biology through its initial turbulent but productive period. He played a major role in the building of a primate facility, which was acknowledged as one of the best in the world. In 1989 in recognition

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of the significant contributions made by Moudgal and Adiga to reproductive biology and molecular endocrinology, a new centre was established at the IISc campus under the umbrella programme of the Department of Biotechnology, Govt of India. Adiga was asked to be the Chairman of the Centre. He worked tirelessly to build a very modern centre with excellent faculty until his retirement in 1994. He continued working as an Honorary Professor and in other capacities until his sudden demise. He has published more than 150 papers in all the high impact journals of Biochemistry, Molecular Endocrinology, Reproductive Biology, Immunology, etc.

He was a widely read intense individual with a deep commitment to science and was very critical of his own work and that of others, which made him a superb teacher and research leader. He was a

terror at interviews and seminars and asked searching questions, sometimes even tricky ones. Although this did not endear him to the recipient at the moment, they remembered him lifelong. Many of them recollect these incidents with affection. Once you pierced this forbidding exterior, he was very humane. He made available his extensive knowledge to students and colleagues. He trained more than 20 Ph D, students, many of whom occupy high professorial positions in the academic world as well as important places in Industry in India and abroad.

Adiga received several awards, starting with the Giri Memorial Award for the best Ph D thesis of IISc during 1963; S. S. Bhatnagar Prize in Medical Science and Technology awarded by CSIR in 1980; Sanjay Gandhi Award for Science and Technology in 1982; Sreenivasaya

Memorial Award of the Society of Biological Chemists, India in 1984; M. R. N. Prasad Memorial Award Lecture, Indian National Science Academy, 1992. He was a Vice-President of the Society of Biological Chemists, India; Indian Society for Human Reproduction; Fellow, Indian Academy of Sciences; Fellow, Indian National Science Academy, and a Member, New York Academy of Sciences, USA.

Adiga leaves behind his wife, two daughters, three grandchildren, host of students and colleagues to mourn his tragic passing away.

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Vishnu Ganesh Bhide (1940–2006)

The passing away of V. G. Bhide in June 2006 was an unbearable shock for the scientific community, education circles, industries, innovation centres, non-government organizations and most importantly the common man. By his enormous scientific talent, his passion for the upliftment of the quality of school, college and university education in our country, his vision for a better future for our students driven by his nationalist spirit, his ability to lead by example, his inner purity of purpose and the ability to work extremely hard towards a cherished goal, he touched almost all aspects of social fabric related to the betterment of our future. Some of us had the good fortune of not only knowing him personally but also to work with him over the years in the pursuit of knowledge. His wife Prabha Bhide, has always been a great support and strength in all his endeavours, and with her extremely pleasant and quiet disposition she made everybody who came to know both of them personally, respectfully comfortable within a short time.

After securing the first rank and gold medal in his M Sc examination from Nagpur University, Bhide obtained Ph D

in Physics from the same university. He then joined the Institute of Science, Nagpur as a very young faculty member. He



went to UK for further studies to gain first-hand experience in the newly developing field of Solid State Physics. Here he obtained another Ph D degree from London University. After his return, he joined his duties back at Nagpur but soon was transferred to the Royal Institute of Science, Bombay as the Head of the Department of Physics. Under extremely

difficult circumstances he followed his dream of doing good experimental research in India. Recognizing the significance of the Nobel Prize-winning research of Mössbauer early, he set out to establish this technique and the corresponding physics research. He wrote some outstanding research papers at that time which are still cited for their truly original contribution to our understanding of hyperfine interactions in ferroelectric, magnetic and dielectric/ceramic oxides. He then moved to Delhi to take up a leading position at National Physical Laboratory. While continuing his research interests in Mössbauer spectroscopy and its applications to Materials Science, he began to move to other fields of significance to our country such as alternate sources of energy. He continued to make significant research contributions while at NPL. Bhide won many honours and awards including the *Padmashree* and the fellowships of all the three national academies. He also served on several national and international boards/committees dealing with issues of critical importance for our country. He then moved to Pune University on invitation of the university to head the school of energy