

## Madhu Sudan Kanungo (1927–2011)

M. S. Kanungo, an eminent biochemist and an internationally known gerontologist from the Department of Zoology, Banaras Hindu University (BHU), Varanasi, passed away on 26 July 2011. He was ill for the last few years.

Kanungo was born on 1 April 1927 at Berhampur, Orissa. He completed his graduation from Ravenshaw College (now University), Cuttack, Orissa in 1949, obtained his Master's degree in zoology from Lucknow University in 1951 and Ph D degree in physiology from the University of Illinois (Urbana), USA in 1959 under the supervision of C. Ladd Prosser, a doyen in the field of comparative animal physiology. After serving as Lecturer in zoology at the Ravenshaw College, and Reader in Zoology at Utkal University during 1961–62, Kanungo joined the Department of Zoology at BHU and served as Reader (1962–69) and Professor (1970–87). He was Head (1974–76 and 1980–82) and Coordinator, Centre of Advanced Study (1982–87) of the Department of Zoology and Dean, Faculty of Science (1986) at BHU. He was made an Emeritus Professor (for life) at BHU (1993–2011) in the same department. Kanungo was an active and popular teacher of physiology, biochemistry and molecular biology for more than 40 years. He started a laboratory for research in modern biology and created an active group, which became famous for its work in gerontology. Kanungo was the Founder Director (honorary) of the Institute of Life Sciences of Government of Orissa at Bhubaneswar during 1990–96.

Kanungo has received many prestigious awards and recognitions for his teaching and research work in the field of biochemistry and molecular biology of ageing, such as Shanti Swarup Bhatnagar Prize of CSIR (1971), National Fellow (1976–77), Visiting Professor at the West Virginia University, USA (1977–78), National Lecturer (1982) of UGC, Jawaharlal Nehru Fellowship (1987–89), FICCI Award (1989), INSA Golden Jubilee Commemoration Medal (1992), Emeritus Scientist of CSIR (1989–94),

Senior Scientist INSA (1995–99), Sir Shriram Memorial Oration Award Medal of National Academy of Medical Sciences, India (1998), Padma Shri (2005) and Chancellor of Nagaland University (2009–11). He was elected fellow of the Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences (India), National Academy of Medical Sciences and the Indian Academy of Neurosciences.



Kanungo introduced a strong teaching and research programme in physiology and biochemistry as early as 1960s, which he developed into biochemistry and molecular biology in 1980s. Later he initiated and was also coordinator of a 'Brain Research Centre' under the XI Plan of UGC at the Faculty of Science, BHU. He has produced 32 Ph D students, spread over many universities and institutions in India and abroad. Kanungo had published 139 papers in the area of 'biology of ageing' and has authored two books: *Biochemistry of Ageing* (Academic Press, UK, 1980; translated into Russian) and *Genes and Aging* (Cambridge University Press, UK, 1994). He had proposed a theory and a model on ageing in 1975, which is known as 'gene regulation theory of ageing'. This theory suggested that genes are responsible for ageing in mammals. The ageing process starts soon after reproductive maturity due to depletion of certain essential factors resulting into gradual decline in the

physiological processes, which dysregulates the metabolic homeostasis. However, it may be possible to postpone ageing by replenishing the essential metabolic factors. His research has shown how activities of many physiological/metabolic enzymes and their isoenzyme patterns, steroid hormone/neurotransmitter receptors, chromatin structure and its post-translational modifications and function(s), DNA methylation, expression of genes into mRNAs and binding of transcription factors into promoters of genes change during ageing and contribute to the ageing process in mammals and birds. Kanungo has published in prestigious scientific journals and has been highly cited internationally. He has delivered a large number of invited lectures and chaired many scientific sessions in national and international conferences. He has also organized a number of national and international symposia/workshops at BHU and Bhubaneswar.

Besides doing teaching and research at BHU, Kanungo was an active member and chair in many Government committees. He was the Founder President (1981–88) and patron (1989–2011) of the Association of Gerontology, India. He was also an active member of the National Council for Older Persons of Government of India, Ministry of Social Justice and Empowerment from 1999 to 2011, which proposed the National Initiative for Care of Elderly policy.

Kanungo's devotion and dedication to teaching and research will remain an inspiring example for the younger generations at BHU and other Indian universities. He was also interested in sports like cricket and tennis. Kanungo is survived by his wife, three sons and four grandchildren.

PRAMOD C. RATH

*Molecular Biology Laboratory,  
School of Life Sciences,  
Jawaharlal Nehru University,  
New Delhi 110 067, India  
e-mail: pcrath@mail.jnu.ac.in*