

explored the role of epigenetic modification and reported that the promoter hypermethylation was common in *MGMT* (41%) and *ECAD* (35%) followed by *p16* (23%) and *p15* (23%) genes. Among the tumour suppressor genes, *p53* was reported as preferred target for mutational inactivation in oral cancer and majority of them were transition mutations, suggesting the role of tobacco specific nitrosamines. Interestingly, the *p53* mutations were found to be less frequent (<25%) and *H-ras* mutations were more frequent (>35%) in oral cancers. His laboratory showed the association of ADH1C\*2/\*2/MTHFR 677TT genotype combination with the risk of developing oral cancer in alcoholics. His research group isolated two potential anticancer compounds Cleistanthin A and Cleistanthin B from a poisonous plant *Cleistanthus collinus* and showed that both compounds induced DNA damage, growth arrest and apoptosis in cancer cells.

Shanmugam received several awards and honours: ICMR Award for Biomedical Sciences, INSA Senior Scientist Award and UGC National Lectureship. He was an elected fellow of the Indian National Science Academy (New Delhi), Indian Academy of Sciences (Bengaluru), and National Academy of Sciences, India (Allahabad).

Besides cancer biology research, he actively participated and penned his opinion in *Current Science* about GM crops and suggested that scientists should have greater responsibility to consider the documented environmental impacts before recommending GM crops. He also wrote about improvement of higher education in India and the need for good quality teachers. He proposed a certified teachers examination (CTE) at the national level for aspiring teachers. The top 5–10% candidates who clear CTE may be declared as National Certified Teachers. In college accreditation, he considered that weightage should be given also to the number of national certified teachers employed in that institution. He believed that interest towards science should be encouraged in the young minds at school level. When we planned to institute an endowment in Shanmugam's name in the School of Biological Sciences, MKU he advised us to allocate sufficient funds for two prizes/citations for school children, one each to be given to a boy and girl during the science day celebration.

Finally we would like to share one of his students Padmaja's observations that will nicely sum up who Shanmugam is: *'It is also what he did NOT do that made Prof. GS the great man he was and will be remembered for. He did not have the high and might superior attitude. In a true Socratic tradition, he did not impose any sort of intellectual limitation on his students. His students were as free to choose their topics as they were to make mistakes. He did not ridicule when his students faltered, neither did exalt the success of any one person. He did not set a hierarchical system within his domain. From the glassware washer to the post-doc, everyone was on the same footing in the lab. His attitude was perhaps best epitomized by the fact that he never locked his room and every student could walk right in without once knocking.'* We salute him for the inspiration and support he extended to all the students of School of Biological Sciences, MKU.

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Govindaswamy Shanmugam (GS), pioneer cancer biologist of the country, died on 15 April 2015 in Madurai at the age of 77 years. He was born on 18 December 1938 at Vallampadugai, Tamil Nadu. He received his Ph D degree from Osmania University in 1968 and served as an Assistant Professor at the Institute for Molecular Virology, St Louis, USA from 1973 to 1978. GS worked on the synthesis and assembly of adenoviruses and moloney murine leukaemia virus in human cells. He discovered the subgenomic viral mRNAs and their function. In 1979, he moved to the School of Biological Sciences at Madurai Kamaraj University (MKU), first as a reader and then became

a Professor in 1985 until formal superannuation in 1999. GS continued his work at Madurai as INSA Senior Scientist and emeritus professor until 2008, when he became Director of the Oncophyta Labs. His contributions included the biosynthesis of viral components in murine leukaemia virus-infected cells. He had an abiding interest in understanding the molecular mechanisms of cell proliferation, oncogenes and tumour suppressor genes. Pioneering the research work on replication of DNA and DNA tumour viruses, he discovered a double-stranded RNA-specific nuclease involved in the processing of ribosomal and retroviral RNAs. These findings have been quoted as biological concepts in textbooks.

Establishing a Cancer Biology Laboratory at the School of Biological Sciences, MKU, GS trained a large number of M Phil and Ph D students. He pioneered work on characterizing DNA repair and various enzymatic activities in the placenta. He used mouse and chick embryonic cells and fibroblasts to study the carcinogenic and toxic features of various chemicals and plant-derived compounds. His group investigated the mutations of major tumour suppressor and oncogenes of oral, cervical and breast cancer patients from South India. His work in this area paved the way for the emergence of polymorphism and mutation data from cancer patients in India and eventually led to the establishment of several research groups.

GS is known for his soft-spoken nature and friendly mode of training and guidance, and has been a role-model for many young researchers. He was also a renowned teacher of cell biology. As part of his extension work, GS popularized the traditional Ayurvedic ginger treatment as an option for kidney failure.

He was a Fellow of the Indian Academy of Sciences, Bengaluru (1991), Indian National Science Academy, New Delhi (1993), National Academy of Sciences, India (Allahabad), and International Union of Cancer.

GS leaves behind his wife, two sons, a daughter and a large number of students and admirers.

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