

Aparna Dutta-Gupta (1953–2020)

The Indian scientific community lost Professor Aparna Dutta-Gupta, a well-known insect physiologist and molecular biologist on 29 June 2020. Aparna was a dedicated teacher, a committed researcher, a trusted friend to colleagues, and a kind human being. She was born on 11 May 1953 in Barabanki, rural Uttar Pradesh. As a girl student from a lower-middle-class family, Aparna had to go through enormous difficulties to fulfil her dream of becoming one of the leading scientists in India. She was the eldest amongst the siblings and had to meet the dual role of nursing her younger brothers and sisters, and at the same time pursuing her dreams. Her father had a transferable job, and hence she had to study at multiple government schools across districts like Gonda and Basti of UP. Her undergraduate and postgraduate studies, including PhD, were from Banaras Hindu University (BHU). During this time, she had to walk almost 8 km every day from Ram Nagar located on the other side of The Ganges to attend her classes and research work at BHU. Despite insurmountable difficulties, she finished her degrees with flying colours. She completed her BSc in 1972, MSc in 1974, both with 1st class distinction and PhD in 1978, all from BHU. After completion of her PhD, she joined the University of Hyderabad (UoH) in 1979 as a post-doc. In 1981, she joined as a Lecturer in the School of Life Sciences, University of Hyderabad, and rose to become Professor. She served various positions in University: Head, Department of Animal Sciences; Dean, School of Life Sciences; Coordinator, MSc Biotechnology Programme; and Co-PI, DBT-CREBB programme. She served the University of Hyderabad with distinction for more than 35 years. After her retirement, she continued to serve UoH as a UGC-BSR fellow.

Along with her academic assignments, Aparna had a lot of additional responsibilities as a warden of the Ladies' hostel and others. All through her career, she could impress all the people surrounding her with a clarity of thought, organizational skills, and compassion for fellow workers. She understood the difficulties faced by a girl student and did everything possible to help them out in their struggle to come up. There were cases in

the University where greater involvement was required, and she was always accommodating. She was popularly known as 'ADG Mam', and the name itself would provoke many endearing thoughts and experiences for many of her students and colleagues.

Aparna was a great teacher and always preferred the first hour of the day for teaching Masters' students. After completion of her class, she used to be with doctoral students and post-docs to analyse their data critically and to provide practical guidance. She guided several MPhil and PhDs and the students who



graduated from her lab emerged as successful scientists in industry and academia. Her doors were always open for the students of the School and University. She was a keen listener to both personal and professional problems. It is not easy to find a substitute for Aparna, with her unique problem-solving and counselling abilities. Her life and contributions to the development Department of Animal Biology, School of Life Sciences, and the University of Hyderabad undoubtedly impacted hundreds of young minds for generations to come.

Aparna was an accomplished research scientist, known for her significant contributions to the comparative endocrinology of invertebrates. She was a pioneer in research work on insect molecular physiology, hormonal regulation of insect development and reproduction, and integrated pest management. The focus of her team was on lepidopteran agricultural pests: tobacco caterpillar (*Spodoptera litura*), sorghum stem borer (*Sesamia cretica*) and rice moth (*Corcy-*

ra cephalonica). Her team found that there was a stimulation of RNA and protein synthesis in the mitochondria of early last instar larvae of stem borer by factors from corpora cardiac and corpora allata complex. Exogenous juvenile hormone I suppressed DNA synthesis, while 20-hydroxyecdysone promoted DNA degradation.

She had landmark work in the field of non-genomic action of steroids wherein insect hemolymph protein HP19 mediated the effect of ecdysteroid on acid phosphatase activity during insect development¹. She did extensive work on economically important group of insects, which include a large number of stored grain and agricultural pests to understand insect physiology to unravel novel methods of insect pest management^{2,3}. Her studies using biochemical and molecular tools resolved the developmental and hormonal regulation of various genes, their proteins, and the specific physiological processes in insects⁴. Her primary research goals revolved around: (i) Hexamerin gene expression in the fat body and their hormonal regulation during the postembryonic development⁵; (ii) receptor-mediated sequestration of hexamerins by various tissues and their role in immunity, reproduction, silk secretion and during the metamorphosis⁶; (iii) identification and characterization of *Bacillus thuringiensis* Cry toxin binding receptors in the larval midgut and other visceral tissues⁷; and (iv) deciphering the basis for the development of tolerance/resistance against *Bt* toxins in various lepidopteran insects⁸. Her group identified several candidate genes/factors which could be exploited either for delivering or targeting molecules or growth regulators, which disrupt insect development and reproduction.

Aparna collaborated with scientists from the University and others from India/abroad. These collaborations resulted in several publications on proteinase inhibitors from pulse seeds, the basis of toxicity/detoxification of *Bt* toxin, molecular biology of endocrine action in catfish, and the significance of hormonal action on neuronal system. Her work on Cry proteins and gut receptor interactions provided molecular insights behind the development of resistance to Cry toxins. She made a scientific niche for herself,

published more than 150 research publications, and had one patent.

Aparna was elected fellow of all the three Science Academies of India, viz. Indian National Science Academy India, Indian Academy of Sciences, and the National Academy of Sciences, besides the Telangana Academy of Sciences. She served on various committees in all these Academies. She also contributed immensely by serving as an expert for CSIR-UGC, UPSC, and KVPY examinations. She was invited for several visiting assignments abroad: USA (1984, 1991), Germany (1999, 2000–2003, 2008), Czech Republic (2000) and Japan (2012). She was actively involved in Scientific Societies: General Secretary/Vice-President/President – Indian Society for Comparative Endocrinology; Joint Secretary – Society for Reproductive Biology and Comparative Endocrinology, and Vice President – Indian Society of Cell Biology. She was an editorial board member of *Entomon*, *Archives of Insect Biochemistry and Physiology*, *Current Science* and Guest Editor, Special Volume, *Fish Physiology and Biochemistry* (Springer, Holland). She was a member of Scientific Advisory Committees of UGC, CSIR, DBT, DST, SERB, INSA-DST-INSPIRE and DBT-TWAS. She was also a member of Academic Advisory Bodies of Zoology/Biological Sciences Departments in Visva Bharati (Santiniketan), Delhi University (Delhi), IISER (Kolkata), and MRDG-IISc (Bengaluru).

Aparna helped in the teaching/training activities of other schools and colleges in and around Hyderabad. She made it a

practice to go around various schools and colleges in Hyderabad and outside to deliver lectures to inspire younger minds. She was always enthusiastic about training young minds and was a resource person and co-coordinator of 12 Science Academy sponsored training workshops/lecture courses. She conducted as many as 76 Hands-on Training/Workshops under the umbrella of the UoH-DBT-CREBB Programme.

She was a great philanthropist and had a soft corner for under-privileged kids, especially from Adivasi areas. At a later stage, she adopted thirteen kids from Sajina Gram, a remote village near Bolpur, Santiniketan. In every locality where she lived, she used to help the needy and affected people and was fondly known as 'The AMMA' or 'DIDI' in the area. It is incredible that despite having so much commitment to social and academic life, she was an ideal mother and perfect wife. She was a constant inspiration to her son and was very proud of his achievements.

In her last years, she put up a brave fight against a disease for which modern medical science does not have any cure, but has only remission. She bravely accepted the fact with everlasting smile and endurance. She did win the battle since the disease could never affect her mental processes and scientific alertness. She ensured that her students completed their PhD under her guidance, even when she was not all well.

Aparna is survived by her husband (Prof. S. Dutta-Gupta, a physicist), son, Dr Shourya Dutta-Gupta (a faculty member at IIT-Hyderabad and a material

scientist) and daughter-in-law, Amrita Kundu (a freelance journalist). She will be forever missed by the scientific, teaching, and student communities.

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Dwarka Nath Bose (1938–2020)

Professor Dwarka Nath Bose, a renowned professor of experimental physics, son of Sunil Chandra Bose, first cardiologist of India and nephew of Netaji Subhas Chandra Bose, passed away on 9 August 2020. His demise brings a vacuum among experimental scientists. He was notable for his seminal contributions in the area of semiconductor science and technology as well as fast ion conductors, synthesis of industrially important semiconductors and more emphatically on the preparation of polysilicon from rice-husk.



Bose was born on 25 June 1938 in Calcutta, India. He was the son of Sunil Chandra and Lalita (Dutta) Bose. He obtained Cambridge School Certificate from St Paul's School, Darjeeling, during 1946–52; Bachelor of Science in Physics with Honors from Calcutta University in 1956.

Bose obtained his MSc (Tech) in Radiophysics and Electronics from the University of Calcutta (1959) after which he won an ICI (India) Technical Scholarship and obtained his PhD in Semiconductor Physics from the University of