

Bharat Bhushan Chattoo (1949–2016)

Bharat Chattoo, a legendary scientist and a great human being, passed away on 15 November 2016.

Chattoo was born on 25 May 1949 in Jammu to Shivejee Nath Chattoo and Jaya Chattoo. He received his B Sc in 1968 and M Sc in 1971, both from the University of Jammu and Kashmir. He got his Ph D in 1976 from University of Delhi. In 1980, he was appointed Reader and Co-ordinator at the Centre for Biosciences of University of Roorkee and in 1982 joined the CSIR-Centre for Cellular and Molecular Biology (Hyderabad) as scientist (1982–86). Between 1982 and 1986 he also worked as a scientist at Fredrich Miescher Institute in Basel (Switzerland). In 1986 he joined the M S University (MSU) of Baroda as Professor and became Head of the Department of Microbiology (1996–2001) and Director of Centre for Genome Research of the University (since 2001) and finally as J. C. Bose National Fellow until his death. At Baroda he established a Cluster Innovation Centre to encourage the interface of industry and entrepreneurship in Gujarat. Concurrently, from August 2001 to 2004 he also took responsibility as the Vice-Chancellor of Shri Mata Vaishno Devi University (Jammu) to conceptualize and establish the new University.

The Biotechnology Centre at MSU is widely regarded as one of the leading schools in biotechnology in the country with its alumni occupying responsible positions in academia and industry in India and abroad. Over 20 students have completed their Ph D and around 200 students completed their M Sc dissertation projects under his supervision during the past few decades at MSU. He has mobilized more than Rs 20 crores for his extramural research funding through various national and international grants.

Chattoo established a strong research group on the study of disease resistance in rice and genome analysis in the fungal pathogen of rice *Magnaporthe oryzae*, a cereal killer causing rice blast disease. Over the last three decades, he has made significant contributions to the study of rice-blast pathosystem, which is widely regarded as a model to analyse molecular plant pathogen interactions. His laboratory discovered several new transposable genetic elements in the rice blast fungus –

M. oryzae, reported for the first time in a lower eukaryote. He has been awarded a Centre of Excellence and Innovation under the Category of ‘Outstanding Scientist Research Programme in Biotechnology’, by the Department of Biotechnology, New Delhi in 2009. He was the recipient of Acharya J. C. Bose National Fellowship from the Department of Science and Technology in the same year. He received the Lifetime Achievement Award in 2013 on behalf of an International Rice Blast Community in South Korea.



Chattoo established methods in yeast genetics to understand basic biology and pathways. His laboratory has successfully expressed therapeutic proteins of pharmaceutical interest such as Hepatitis B surface antigen and human epidermal growth factor in non-conventional yeasts and transferred the know-how to the industry. He also used genetic intervention for metabolic engineering in yeast, leading to enhanced growth and production levels. Since 1987 he was an exemplary mentor/supervisor and has trained many graduate students and several post-doctoral fellows in rice blast research. His laboratory was unique in India for the study of rice blast fungal pathogenesis.

His active research collaborations included Federal Institute of Technology (ETH), Zurich (for bioprocess development, reactor design, bioprocess control and automation under Indo-Swiss Collaboration in Biotechnology); International Rice Research Institute (IRRI), Los Banos (for molecular markers and

mapping of blast resistance genes under a Rockefeller Foundation programme); University of Wisconsin, Madison (for genetic variability in the rice blast fungus under a Rockefeller Foundation programme); Salk Institute, La Jolla, San Diego and John Innes Institute, Norwich (for engineering resistance to rice blast under a Rockefeller Foundation programme); Weizmann Institute of Science (for cooperation in bioinformatics sponsored by UNESCO and DBT, GoI and Indian industrial partners); University of Leeds and the Weizmann Institute of Science (for engineering resistance to rice blast under Indo-Israel Bilateral Collaboration); the Rice Genome Programme, Tsukuba (for molecular mapping and genome analysis in rice), National Institute of Bioscience and Human Technology, Tsukuba; Tel-Aviv University, Israel (to study the role of plant SUMO conjugates in biotic stress supported by DST, GOI under Indo-Israeli Collaboration); John Innes Centre, Norwich (molecular analysis of disease resistance signaling supported by DBT under Indo-UK Bilateral Collaboration), etc.

His work fetched him several national and international awards and recognitions. He received the National Technology award at the Technology Day Programme on 11 May 2001 from the Vice President of India for transfer of technologies to the industry. He was awarded the Rockefeller Foundation Biotechnology career fellowship and the STA fellowship from Japan Science and Technology Corporation. He was a fellow of the Indian National Science Academy (INSA), New Delhi; Indian Academy of Sciences (IASc), Bengaluru; National Academy of Agricultural Sciences (NAAS), New Delhi; and National Academy of Sciences, India (NASI), Allahabad; he was an elected member of the Guha Research Conference (GRC) and The World Academy of Sciences (TWAS). He served on several expert committees of the Government of India and was a member of the Gujarat Biotechnology Council. Chattoo was the team leader of the first Indian team that participated in the International Biology Olympiad held at Antalya, Turkey in 2000.

He was a member of several learned societies or associations such as Genetics Society of America, International Society of Plant Molecular Biology, American Society of Microbiology, Society of Biological Chemists-India, National Science Foundation Bi-national (US-Israel) Grants Review Panel, Review Panel of Swiss National Science Foundation, Review Panel of Indo-Swedish Collaboration in Biotechnology, Board of Governors of Vikram A. Sarabhai Com-

munity Science Centre Society-Ahmedabad, Expert Advisory Committee for the Biotechnology Initiatives of the State Government of Gujarat, Gujarat Biotechnology Council, Governing Council of Gujarat Biotechnology Mission, Society of Cell Biology, etc.

His untimely death is indeed a great loss to the academia, biotechnology research community and the scientific community as a whole. He is survived by his wife (Vijaya), a son and a daughter.

MALALI GOWDA¹
SUBHANKAR ROY-BARMAN^{2,*}

¹*Center for Genomics Discovery,
TransDisciplinary University,
Bengaluru 560 064, India*

²*Department of Biotechnology,
National Institute of Technology,
Durgapur 713 209, India*

**e-mail: subhankarroy.barman@bt.
nitdgp.ac.in*
