

BOOK REVIEWS

destructive functions during Alzheimer's disease, initially helping to clear amyloid- β plaques, but prolonged exposure to such plaques may contribute to neuroinflammation.

The biology of respiratory syncytial virus (RSV) has been the subject of focus, as discussed by Openshaw *et al.* (pp. 501–532). The virus has a ubiquitous presence; children are often infected before they are two years old. Repeated infections which occur throughout life are of interest from an immunological

standpoint. Why memory responses fail to confer protection (despite the fact that the RSV genome is relatively conserved) is an open question. The ability of non-structural proteins of RSV (NS1, NS2) to inhibit interferon production and signaling suggests that disruption of innate immune mechanisms may be involved. The extent to which dysregulated immune responses contribute to pathology is also an area of particular concern, given the ability of the virus to cause debilitating disease in the elderly. Ongoing

efforts in the development of safe and effective vaccines are hampered by the lack of a good immune correlate of protection.

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PERSONAL NEWS

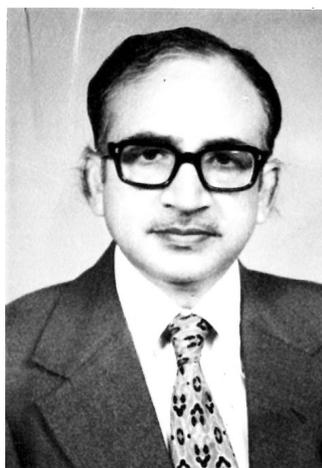
Raghunath Prasad Rastogi (1926–2018)

Professor Raghunath Prasad Rastogi was born on 4 June 1926 in Lucknow to Purushottam Das Rastogi and Ram Janaki. Raghunath performed exceedingly well in the high school and intermediate examinations. Then completed his B Sc in 1946 and later B Sc (Hons) and M Sc from Lucknow University securing first positions in 1947 and 1948 respectively. In 1952, he obtained Ph D in chemistry under the supervision of A. C. Chatterjee on 'Studies on physical properties of supernatural solution'.

Rastogi's academic career started in Lucknow University as a Lecturer in chemistry (1949–59) and then as Reader in chemistry in Punjab University (1959–62). In 1962, he joined the then Gorakhpur University as Professor and Head of the Chemistry Department. He served the University till 1985, when he moved to Banaras Hindu University (BHU), Varanasi as Vice-Chancellor. He completed two terms in this position until 1991. He wanted to continue his research and joined the Central Drug Research Institute (CDRI), Lucknow and worked as Emeritus Scientist till 1994. He then once again joined Lucknow University as an INSA Senior Scientist in 1995 and continued till 1999. During the same period (1994–96), he served as Chairman of the Pay Commission (UGC) for university and college teachers. From 2006 till 2018, he was INSA Honorary Scientist until he breathed his last on 8 April 2018.

Rastogi has made significant theoretical and experimental contributions in

linear thermodynamics of irreversible processes with special reference to electrokinetic, electrophoretic and osmotic phenomena and Dufour effect, along with equally significant contributions in nonlinear steady-state electrokinetic phenomena. He made important contributions in far-from-equilibrium phenomena (oscillatory reactions, electrokinetic oscillations, pattern formation in chemical reactions, crystal growth and electrodeposition) regarding nonlinear dynamics. His contributions also include



thermodynamics and thermochemistry of eutectic mixtures, addition compounds (including kinetics and diffusion mechanism of solid–solid reaction for compound formation) and on burning rate, ignitability and mechanism of combustion of composite solid, liquid and hybrid propellants.

In view of the fact that classical theory of irreversible processes is valid till linear relations between fluxes and forces are valid, Rastogi studied the nonlinear relation between fluxes and forces, especially, the linear range. However, owing to experimental constraints, nonlinear range could not be studied for all phenomena. In the area of reversible thermodynamic processes, he was enthused to carry out the work on phase diagrams to study the thermodynamic properties of mixtures. So his group initially carried out a study on phase diagrams of binary mixtures of benzene, carbon tetrachloride and cyclohexane. It revealed the formation of molecular complexes between benzene and carbon tetrachloride, which was later supported by American workers. A detailed study on carbon tetrachloride–aromatics and chloroform–aromatics was also carried out. On the electrical effects during dissolution and precipitation of electrolytes, Rastogi with his colleagues published a paper in *Nature*¹. The work on solid-state processes was a consequence of his work on phase equilibria. This prompted Rastogi's group to go for deeper studies in the chemistry of eutectics and addition compounds. They investigated the thermochemistry, crystallization and microstructure of eutectics. Among addition compounds, novel inorganic reactions lead to the isolation and characterization of mixed halide of mercury and thallium². His work on combustion processes was mainly concerned with ignition, mechanism of pre-combustion reactions,

degradation of polymers, nozzle theory and recombination kinetics³.

Rastogi authored several books: *An Introduction to Quantum Mechanics of Chemical Systems* (Oxford and IBH Publishers, 1986); *Introduction to Chemical Thermodynamics* (with R. R. Misra, 6th revised edition, Vikas Publishing, 1995); *Modern Inorganic Chemistry* (8th revised edition (with N. B. Singh and Narendra Nath, United Book, 1997); *Modern Physical Chemistry* (5th revised edition with K. Singh, K. Kishor, V. K. Srivastava and M. L. Srivastava, United Book, 1995); *Transport Mediated by Electrified Interface – Studies in Linear, Nonlinear and Far from Equilibrium Regimes vol. 18* (Elsevier, 2003); *Introduction to Non Equilibrium Physical Chemistry – towards Complexity and Non Linear Science* (Elsevier, 2008).

Following his research achievements, Rastogi was awarded the Royal Society and Nuffield Foundation Commonwealth Bursary during 1956–57. He was also the recipient of Fulbright Visiting Professorship in Indiana University, USA during 1968–69. In 1971, he got an opportunity

to work as a visiting professor with Nobel laureate Prof. I. Prigogine at University of Brussels, Belgium. In 1972–75, he worked as a consultant at the Vikram Sarabhai Space Centre, Thiruvananthapuram and in 1974 was awarded the Khosla National Award for his well-recognized contributions in non-equilibrium thermodynamics and rocket propellant technology. Other awards received by Rastogi include: FICCI National Award, Meghnad Saha UGC National Award, Professor S. R. Palit Award, the INSA Lecture Award, and the P. C. Ray Memorial Medal of the Indian Chemical Society (Kolkata). The Uttar Pradesh Government honoured him with Vigyan Gaurav Samman followed by Saraswati Samman in 2010 on Teachers' Day.

Rastogi also received several lifetime achievement awards – Indian Chemical Society (1991), Chemical Research Society of India, Bengaluru (2001), and the National Association of Chemistry Teachers, Lucknow (2015). He delivered several lectures, including the S. Swaminathan 60th birthday commemoration

lecture, Sethna memorial lecture of M. S. University, Baroda, and the Hussain Zaheer memorial lecture of CDRI, Lucknow. He was elected to the fellowship of the three national academies of the country: Indian National Science Academy, New Delhi (1975); Indian Academy of Sciences, Bengaluru (1975), National Academy of Sciences, Allahabad (1972), and the fellowship of the Royal Institute of Chemistry, and American Institute of Astronautics and Aeronautics. Rastogi was also honorary member of the High Energy Research Society of India.

1. Rastogi, R. P. *et al.*, *Nature*, 1961, **191**, 764.
2. Rastogi, R. P. *et al.*, *J. Am. Chem. Soc.*, 1967, **89**, 200.
3. Rastogi, R. P., *Combustion Flame*, 1965, **9**, 417; *J. Spacecr. Rockets*, 1970, **7**, 359.

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