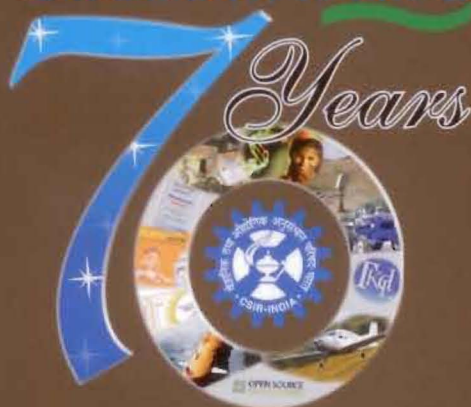


CSIR
CELEBRATING



Outstanding Science

70 YEARS OF OUTSTANDING
SCIENCE IN INDIA



Zinc Oxide Nano Rods



Mapping the Genetic Diversity of India:
IGVdb - 55 Endogamous Populations

Synthetic Clonal Reproduction Through Seeds:
Accelerating Plant Breeding



Hybrid



Uniform progeny; Identical to Hybrid



Foreword

The sinews of CSIR are firmly rooted in its scientific research. CSIR's science is broad, covering disciplines, such as chemical, physical, biological, engineering and information sciences, interdisciplinary, often at the interface of disciplines and increasingly collaborative. The output has been significant. The scientific staff of CSIR only constitutes 3-4 % of India's scientific manpower; yet contribute to 10-11% of India's scientific outputs. CSIR performs science that leads in many frontiers. This is evidenced by its presence in leading journals of the world. CSIR's science also has produced new concepts that have been translated into technologies for the benefit of India.

The science that CSIR performs continues to attract the best talent from the world to come and work in its laboratories and also a large number of students who pursue their PhD degree under the mentor-ship of CSIR scientists. Some of the CSIR alumni are today leading scientists working in national and international laboratories. CSIR scientists are also well recognized by their peers, both, within India and globally. About 15% of the Fellows of the learned Indian academies of science and engineering are from CSIR laboratories. Five scientists of CSIR have been Fellows of the Royal Society, London who have lead CSIR in various capacities.

CSIR's commitment to pursuit of path breaking science is total. We continue to invest in creating state-of-the-art facilities in our Laboratories, to enable our scientists to reach even greater heights of excellence. We believe that future technologies that India will need is deeply rooted in the fundamentals of science; and it is only through leadership in science that we can apply research for the good of the people.

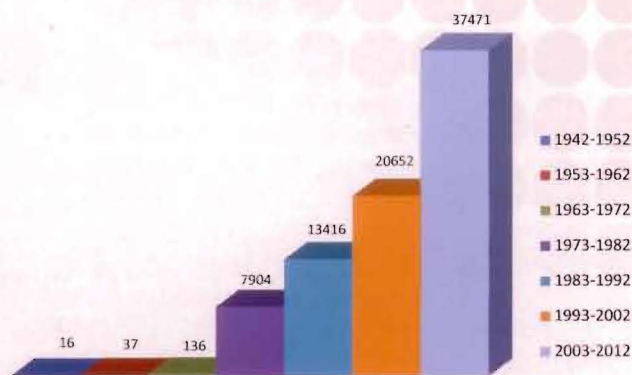
In the following pages, we highlight the growth of science in CSIR, profile the impact making works of eminent scientists and give indicative lists of papers that have received high citations.

Prof. Samir K. Brahmachari
Director General, CSIR

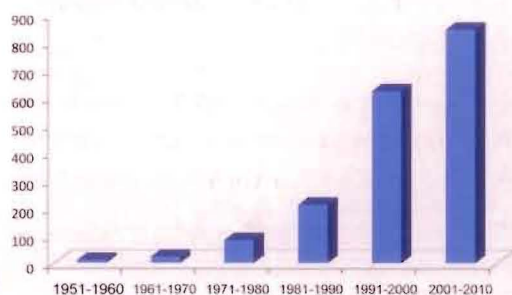


CSIR's 70 years of outstanding science

In its 70 years of existence, CSIR has produced eminent scientists, provided scientific leadership, evolved socially and industrially relevant technologies and has built scientific institutions that are hallmarks of outstanding scientific and industrial research in the country. The foundation for excellence in research was laid by none other than Sir S. S. Bhatnagar, the Founder Director (since Director General) of CSIR, a scholar par excellence who authored several research papers that found way into journals such as *Nature* and *Science*. Since then, CSIR's research papers in peer reviewed journals have been on a growth path.

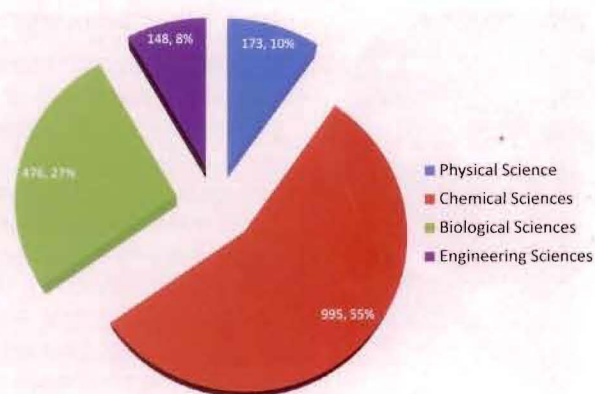


Note: Number of papers reflected here for the earlier decades (1942-72) is lower than the actual numbers due to coverage and indexing limitations of the Web of Science database



In the last 70 years, CSIR has published about 80,000 research papers in peer reviewed scholarly journals that are indexed in the Web of Science. Decade-wise break-up of the papers show that the latest decade (2003-2012) has been the most productive one with about 37,500 papers (47%) being published during this period. During 2011, CSIR published highest ever 4673 papers with highest average IF 2.37. CSIR scientists published about 130 papers and reports in *Nature* over the seven decades. Interestingly, more than 30 papers each published in *Science* and *PNAS (USA)* are of more recent origin.

Ever since the advent of citation indexing, the number of citations received by a paper has been an indicator of quality of a paper. Being a simple measure, there are caveats when handling a large set of research papers, from diverse disciplines, and that span over a long period of time, all typical of CSIR research papers. Further, the citation index itself came into being in 1960 and coverage of research papers in citation indexing databases for older periods are uneven, limited and fraught with inconsistencies. Despite these, citation counts of recent publications can provide an indicative picture of the quality dimension one seeks to reflect on.

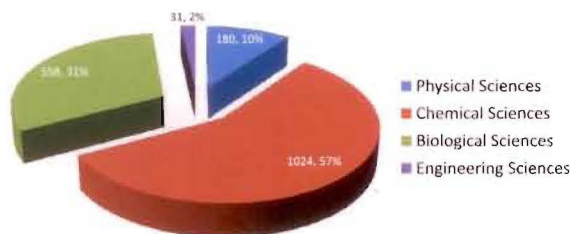


Cluster-wise distribution of CSIR papers with 50 or more citations

All papers with 50 or more citations excluding review papers were fetched from the Web of Science database. About 1800 papers have 50 or more citations and such papers that are able to earn higher citations are growing with every passing decade. Out of the 1800 papers that have been cited 50 or more times, 329 papers have received 100 or more citations. One of the papers with the highest number of 950 citations, so far, has

been published in CSIR's own journal, *Indian Journal of Biochemistry & Biophysics*¹.

Kochhar² notes, "If chemical industry today is an important part of Indian economy it is no small measure due to the scientific and managerial efforts of Bhatnagar....." Broadly, the CSIR laboratories can be grouped into physical (5 labs), chemical (9), biological (11), engineering (10) and information sciences (2) labs. CSIR's pioneering research works in engineering, physical and biological sciences are well known. However, it is research papers in chemistry journals that constitute the larger slice of the pie in terms of the number of papers with 50 or more citations. Even among the cluster of laboratories, the chemical sciences cluster of labs contributes the majority of papers. So, it appears that CSIR's stronghold in chemistry from Sir Bhatnagar's times continues to this day.



Subject-wise distribution of CSIR papers with 50 or more citations

References

1. Kakkar P, Das B, Viswanathan P N, A modified spectrophotometric assay of superoxide-dismutase, *Indian Journal of Biochemistry & Biophysics*, 21 (2), 1984, 130-132.
2. Kochhar R, S. S. Bhatnagar: Life and Times, *Resonance*, April 2002, p. 82

Fellows of the Royal Society in CSIR

Many Indian scientists of eminence have been from CSIR. Several of them are Fellows of the Academies, winners of Bhatnagar Prize and recipients of many national and international awards. However, being appointed as a Fellow of the Royal Society, London is a rare honour and CSIR takes pride that five of its eminent scientists have been appointed as Fellows of the Royal Society. A brief on each of them is given here.



Prof. Shanti Swarup Bhatnagar, FRS

Professor Bhatnagar spent 16 years in Lahore as the Director of the University Chemical Laboratories of the Panjab University. This was the most active period of his life for original scientific work, publishing about 100 papers. His major areas of research were the chemistry of colloids, magneto-chemistry and applied industrial chemistry. In 1938, jointly with R. N. Mathur (who later on became the director of the CSIR-Central Scientific Instruments Organization, Chandigarh) he invented an instrument called the Bhatnagar-Mathur Magnetic Interference Balance for measuring magnetic properties. This was patented and licensed to M/s Adam Hilger and Co, London that marketed the instrument. Dr. Bhatnagar combined pioneering basic research with purposeful applied research proving that they are not mutually exclusive. He was one of the earliest of Indian scientists, who created wealth out of

knowledge using intellectual property, but refused to accept any financial reward for himself and donated all income to the laboratory. His contributions to science can be described in terms of the following areas.

Physical chemistry of emulsions^{1,2}

Dr. Bhatnagar acquired his interest in this area while working with Professor Donnan at the University College, London. His extensive studies on inversion of emulsions by electrolytes had a profound effect on the practical

and theoretical understanding of the behavior of emulsions. He formulated the following empirical rules: (water in oil emulsion can be transformed into oil in water emulsion by electrolytes having anions like hydroxyl and phosphate and (b) an emulsion of oil in water can be reversed by electrolytes having cations like proton, aluminum (3+) and Iron (3+). His work also resulted in a hypothesis which states that all emulsifying agents with an excess of negative ions and wetted by water will yield oil in water emulsion while those having excess of adsorbed positive ion and wetted by oil will result a water in oil emulsion. This hypothesis is true to this day.

Magneto-Chemistry³⁻⁶

Dr Bhatnagar used magnetic susceptibility measurements to explore the properties of organic compounds, solutions, films and colloids. He showed that for inorganic compounds, the sum of ionic susceptibilities gave the molecular susceptibility. He established that the temperature dependence of magnetic susceptibilities is different for symmetric molecules, associative liquids and aromatic compounds. He investigated the nature of oxide films formed on strips of heated copper using magnetic measurements and deduced that they contain higher oxides of copper. He provided definitive evidence for the existence of ionic micelles by the study of magnetic rotations of solutions salts of higher fatty acids in water and alcohol. His work resulted in a definitive monograph on the subject titled Physical Principles and Applications of Magneto-Chemistry published by MacMillan and Co Ltd in 1935.

Other Research^{7,8,9}

Dr. Bhatnagar indulged in many diverse areas of research. He published an interesting paper on the effect of light on bacterial growth in 1926. He explored photo-polymerization of anthracene from a magnetic point of view. He studied the influence of polymerization on magnetic susceptibilities and the absorptive properties of synthetic resins. He examined the role of glacial acetic acid in petroleum refining.

References

1. Bhatnagar S S, Reversal of phases in emulsions and precipitation of suspensoids by electrolytes: an analogy, *Transactions of the Faraday Society*, 16, 1921, A027-A031. (Citations: 0)
2. Bhatnagar S S, Pure aniline and water emulsions, *Journal of Physical Chemistry*, 25 (9), 1921, 735-741. (Citations: 0)
3. Bhatnagar S S, Mathur R N, Mal R S, Magnetism and molecular structure. - Part I. The magnetic susceptibilities of some liquid organic isomers, *Philosophical Magazine Series*, 7, 10 (62), 1930, 101-109. (Citations: 13)
4. Bhatnagar S S, Mathur R N, Investigations on the effect of crystalline structure on magnetic susceptibilities by a new magnetic balance based on the principle of interference of light, *Philosophical Magazine Series*, 7, 8 (54), 1929, 1041-1055. (Citations: 2)
5. Bhatnagar S S, Mathur R N, Kapur R N, The effects of magnetic field on certain chemical reactions, *Philosophical Magazine Series*, 7, 8 (51), 1929, 457-473. (Citations: 22)
6. Azim M A, Bhatnagar S S, Mathur R N, Influence of temperature on the diamagnetism of certain liquids, *Philosophical Magazine Series*, 7, 16 (106), 1933, 580-593. (Citations: 14)
7. Bhatnagar S S, Lal R B, Effects of polarised light on bacterial growth, *Nature*, 117, 1926, 302. (Citations: 5)
8. Bhatnagar S S, Kapur P L, Kaur G, Photopolymerisation of anthracene in benzene solution from the magnetic standpoint, *Proceedings of the Indian Academy of Sciences, Section A*, 10 (6), 1939, 468-476. (Citations: 2)
9. Bhatnagar S S, Ward P J, Glacial acetic acid in petroleum refining, *Industrial & Engineering Chemistry Research*, 31 (2), 1939, 195-199. (Citations: 0)

Prof. K. S. Krishnan, FRS

Prof. Sir K S Krishnan, FRS was one of the visionary physicists of his time in the world. His research contributions encompass various areas of physics in both classical and quantum domains. Prof. Krishnan's scientific career began with the studies of elastic and inelastic light scattering in collaboration with Prof. C. V. Raman, thus making important contributions to the discovery of the Raman Effect. He had an ardent acumen both for experiments and theory. With this rare ability, he contributed enormously in the areas of crystal magnetism, molecular arrangements in solids and liquids, optical and magnetic anisotropies and magnetic susceptibility of a large number of diamagnetic and paramagnetic substances, role of structural disorder in electrical transport in elemental solids and liquid metals, and determination of the work function of metals as a follow up of these studies. His contributions to the discovery of diamagnetism in graphite by studying its electronic behavior are considered to be path breaking research. Determination of thermionic constants of metals and semiconductors and thermal conductivities of metals at high temperatures talk of his ingenious contributions towards science. His seminal papers on studying the distribution of temperature in electrically heated thin rod and wire in vacuum, have paved ways for applications in modern industries dealing with electrical technology. His vision and dedication to science is embodied in the National Physical Laboratory, which he served as its First Director.



References

1. Krishnan K S, Roy S K, The frequencies and the anharmonicities of the normal modes of oscillation of alkali halide crystals .1. Lattice Oscillations, *Proceedings of the Royal Society of London Series A-Mathematical and Physical Sciences*, 207(1091), 1951, 447-460. (Citations: 62)
2. Krishnan K S, Roy S K, The frequencies and the anharmonicities of the normal modes of oscillation of alkali halide crystals .2. Low-Frequency Acoustic Modes, *Proceedings of the Royal Society of London Series A-Mathematical and Physical Sciences*, 210 (1103), 1952, 481-497. (Citations: 62)
3. Krishnan K S, Bhatia A B, Electrical resistance of liquid metals, *Nature*, 3965 (503), 1945, 156-504. (Citations: 20)
4. Krishnan K S, Jain S C, Thermionic constants of the iron group of metals, *Nature*, 170 (4331) 1952, 759-759. (Citations: 11)



Dr A. P. Mitra, FRS

Dr Ashesh Prosad Mitra, FRS initiated the radio science activities in India in early 1950s and made important contributions in improving the radio communication capabilities in the country. He led the Indian research activities on ionosphere and space physics for more than five decades. His work on Sudden Cosmic Noise Absorption (SCNA) led to the invention of 'Riometer' for ionospheric studies. He also initiated the studies on tropospheric radio wave propagation and associated radio communication in India. Dr. Mitra was the pioneer of global change research activities in India which he initiated in late 1980s. He started the preparation of Greenhouse Gas (GHG) emission inventories in India. He also initiated the measurement programme for estimation of methane emissions from Indian rice paddy fields which significantly contributed in modification of estimation methodology. He promoted quality measurements for reducing uncertainties in GHG emission

estimations from different sources. Dr. Mitra played pivotal role in several international and national science programmes in the fields of space and atmospheric sciences which included 'International Geophysical Year (IGY) Programme', 'Indian Middle Atmosphere Programme (IMAP)' to probe the atmospheric region between 15 to 85 km which serve as long-term reservoir of man-made emissions and 'Indian Ocean Experiment (INDOEX)' which led to the recognition of significant role being played by black carbon (BC) in the atmospheric processes. He catalyzed several inter-disciplinary studies on climate change and its impacts on various sectors like agriculture, health, water etc. in India. The division of Radio and Atmospheric Sciences which he founded and nurtured at National Physical Laboratory continues to serve the Nation.

References

1. Mitra A P, D-Region in disturbed conditions, including flares and energetic particles, *Journal of Atmospheric and Terrestrial Physics*, 37, 1975, 895-913. (Citations: 27)
2. Mitra A P and Shain C A, The measurement of ionospheric absorption using observations of 18.3 MC S Cosmic radio noise, *Journal of Atmospheric and Terrestrial Physics*, 4, 1953, 204-218. (Citations: 73)
3. Mitra A P and Jones R E, Recombination in the lower ionosphere, *Journal of Geophysical Research*, 59(3), 1954, 391-406. (Citations: 31)
4. Mitra A P and Rowe J N, Ionospheric effects of solar-flares .6. Changes in D-region ion chemistry during solar-flares, *Journal of Atmospheric and Terrestrial Physics*, 34 (5), 1972, 795. (Citations: 13)
5. Ramanathan V, Crutzen P J, Mitra A P, Sikka D, The Indian Ocean experiment and the Asian Brown Cloud, *Current Science*, 83(8), 2002, 947-955. (Citations: 27)



Prof. Roddam Narasimha, FRS

Prof. Narasimha's research has been chiefly concerned with aerospace fluid dynamics and certain related problems in the atmosphere. His major contributions towards the understanding and modeling of fluid flows have involved an intelligent blend of experiments, theory and numerical computations. He has influenced fluid dynamics research in India significantly and is a highly accomplished and greatly respected international scientist in this area. His key scientific contributions are in the following areas:

Laminar-turbulent boundary layer transition and re-laminarization¹

4, 5, 14

Prof. Narasimha's early research was on transitional boundary layer flows at low speeds and very little was known about such flows. The central theme of the work was on transition intermittency, in particular, intermittency factor, which is the fraction of time the flow is turbulent at a given point in flow. Detailed and careful experiments and intelligent analysis led to the modeling of the transition zone and be able to calculate the mean velocity profiles and wall skin friction which are very important parameters needed in engineering. This was an outstanding achievement and some of the basic ideas have seen support from later studies including at high speeds.

Prof. Narasimha and his students made significant contributions to the understanding and modeling of re-laminarizing boundary layer flows (sometimes called reverse-transition) in strong favourable pressure gradients – this is a process by which a turbulent boundary layer flow undergoes transition to an effective laminar state under certain conditions. While earlier work emphasized on the onset of re-laminarization, Prof. Narasimha focused attention on the later stages or completion of re-laminarization, and modeled the flow using a hypothesis that streamwise pressure gradients dominate the Reynolds shear stress gradient in such

flows. His elegant and simple mathematical formulation led to a very successful calculation method for re-laminarizing boundary layer flows. These ideas have seen excellent application to the broad understanding and modeling of re-laminarization at the leading edges of aircraft swept wings recently. He also provided basic ideas to group re-laminarizing flows in several other flow situations under three archetypes and outlined the essential dynamics.

Structure of turbulent flows^{2, 6, 7, 8, 9, 12, 13}

Turbulent flows have always held a fascination for Prof. Narasimha. His proposal that turbulent flows always relaxes slowly back to equilibrium, if left alone, culminated into a relaxation-equilibrium model for turbulent shear stress (a physics based model). Experimental work on turbulent wakes showed ample evidence to support this conceptual proposal. Pioneering work on structure of turbulence, especially, the scales that is responsible for sustaining turbulence in shear flows was one of his deep interests. He along with students in IISc showed that these turbulence sustaining eddies scaled with the boundary layer outer variables, something not obvious at that time –this is one of the widely referred publication and debated even now. He also used atmospheric boundary layer observations, which was carried out as a part of a major national programme "MONTBLEX", pioneered by him. Narasimha has exploited the use of matched asymptotic expansions to clear many confusions that prevailed and bring clarity to several fluid dynamic problems including second order effects in boundary layers, re-laminarization, stability of non-parallel flows etc.

Atmospheric Sciences^{11, 14, 16}

Prof. Narasimha's contributions to the field of Atmospheric Sciences are both as institutions builder and researcher. He founded the Center for Atmospheric & Oceanic Sciences at IISc. His vision led to the establishment of Ministry of Earth Sciences in 2005. His concept paper on the promotion of weather research in the country and his zeal for the use of parallel computers for monsoon prediction led to 'Varsha' model at Flosolver at NAL. His is the only group in the world that has pioneered and still making in depth studies of cloud dynamics addressing entrainment and mixing processes in cumulus clouds through laboratory experiments on volumetrically heated flows and numerical modeling. He was instrumental in conducting MONTBLEX, a monsoon field experiment in 1990. Based on these measurements, he along with his associate developed a new flux scheme for surface fluxes under low wind regime over land.

Rarefied Gas Dynamics^{3, 10}

Prof. Narasimha studies rarefied gas dynamics in the early years along with his students and collaborators at Caltech. One of the problems widely investigated led to the understanding of structure of shock waves by solving Boltzmann equation. He has published extensively on this broad subject.

References

1. Dhawan S, Narasimha R, Some properties of boundary layer flow during the transition from laminar to turbulent motion, *Journal of Fluid Mechanics*, 3(4), 1958, 418. (Citations: 212)
2. Rao K N, Narasimha R, Badrinar M A, Bursting phenomenon in a turbulent boundary layer, *Journal of Fluid Mechanics*, 48, 1971, 339. (Citations: 210)
3. Liepmann H W, Narasimha R, Chahine, M T, Structure of a plane shock layer, *Physics of Fluids*, 5(11), 1962, 1313-24. (Citations: 101)
4. Narasimha R, On the distribution of intermittency in the transition region of a boundary layer, *Journal of the Aeronautical Sciences*, 24(9), 1957, 711-12. (Citations: 73)
5. Narasimha R, Sreeniva K R, Relaminarization in highly accelerated turbulent boundary-layers, *Journal of Fluid Mechanics*, 61, 1973, 417-447. (Citations: 69)
6. Narasimha R, Prabhu A, Equilibrium and relaxation in turbulent wakes, *Journal of Fluid Mechanics*, 54, 1972, 1. (Citations: 49)

7. Bhat G S, Narasimha R, A volumetrically heated jet: Large-eddy structure and entrainment characteristics, *Journal of Fluid Mechanics*, 325, 1996, 303-330. (Citations: 48)
8. Govindarajan R, Narasimha R, Stability of spatially developing boundary-layers in pressure-gradients, *Journal of Fluid Mechanics*, 300, 1995, 117-147. (Citations: 20)
9. Narasimha R, Viswanath P R, Reverse transition at an expansion corner in supersonic-flow, *AIAA Journal*, 13 (5), 1975, 693-95. (Citations: 18)
10. Narasimha R, Deshpande S M, Minimum error solutions of Boltzmann equation for shock structure, *Journal of Fluid Mechanics*, 36, 1969, 555. (Citations: 16)
11. Narasimha R, Kailas S V, Turbulent bursts in the atmosphere, *Atmospheric Environment Part A-General Topics*, 24(7) 1990, 1635-1645. (Citations: 15)
12. Prabhu A, Narasimha R, Turbulent non-equilibrium wakes, *Journal of Fluid Mechanics*, 54, 1972, 19. (Citations: 12)
13. Narasimha R, Dey J, Transition-zone models for 2-dimensional boundary-layers - a review, *Sadhana-Academy Proceedings in Engineering Sciences*, 14, 1989, 93-120. (Citations: 8)
14. Rao K G, Narasimha R, Heat-flux scaling for weakly forced turbulent convection in the atmosphere, *Journal of Fluid Mechanics*, 547, 2006, 115-135. (Citations: 4)
15. Mukund R, Viswanath P R, Narasimha R, Prabhu A, Crouch J D, Relaminarization in highly favourable pressure gradients on a convex surface, *Journal of Fluid Mechanics*, 566, 2006, 97-115. (Citations: 3)
16. Narasimha R, Diwan S S, Duvvuri S, Sreenivas K R, Bhat G S, Laboratory simulations show diabatic heating drives cumulus-cloud evolution and entrainment, *Proceedings of the National Academy of Sciences of the United States of America*, 108(39), 2011, 16164-16169. (Citations: 0)



Dr R.A. Mashelkar, FRS

A distinguishing hallmark of Dr Mashelkar's scientific work has been the seamless confluence of fundamental research with industrial applications - an inspiring example of how relevant research can be done in CSIR. He has the knack of extracting the 'underlying fundamental problems' that need to be solved rather than choosing a problem that can be solved.

The key areas in which he has made pioneering scientific contributions are the following:

Non-Newtonian fluid mechanics

Dr Mashelkar's early research pertained to the fundamental calculations of friction in the flow of non-Newtonian inelastic and viscoelastic fluids past bubbles and particles. This work has important implications on the multiphase flow of non-Newtonian suspensions. Indeed, several unusual phenomena such as the 'acceleration' of terminal settling velocities of consecutively dropped particles and migration of polymers in couette flow, which he had investigated, remain problems of interest even today. Dr Mashelkar's papers in this area are well cited.¹

Polymer reaction engineering

Dr Mashelkar's 10-part paper series² on the detailed modeling of the transport processes and reaction kinetics in an industrial PET reactor has become a classic and has been incorporated into commercial codes such as ASPEN, which are used to simulate PET reactors worldwide. This body of work was inspired by an industrial consulting assignment in his early career at the National Chemical Laboratory. Interestingly, when he returned

to India he wanted to pursue research in non-Newtonian fluid rheology. Lack of basic experimental facilities such as a rheometer did not deter him; he simply started work in an entirely different area, and managed to make significant contributions! This demonstrates not just his sharp intellect but also his attitude towards research which in the end is the art of the possible.

Dissolution of polymers

How polymer particles dissolve in a good solvent is a fundamental research problem of great practical importance. The understanding of the various physical processes that occur during the dissolution event was poor at the time when Dr Mashelkar's group initiated work in the area. Initial modeling efforts from his group led to the discovery that the rate of dissolution became independent of particle size below a certain limit and also of the stirring speed. This intriguing finding led to the new concept of 'disentanglement limited dissolution kinetics', which he not only successfully modeled but also experimentally demonstrated using elegant NMR measurements.³

Smart gels

Dr Mashelkar's group initiated a fundamental research program on superabsorbent and thermo responsive gels, resulting in a series of papers that interrogated the intermolecular origins of volume phase transitions.⁴ He showed that a subtle balance of hydrogen bonding and hydrophobic interactions would result in discontinuous volume transitions of hydrogels. This theoretical insight backed by experimental work led to 'molecular tailoring' of the transition temperature,⁵ first successful modeling of the 'reentrant phenomenon' in mixed solvents, design of smart copolymer gels, understanding of metal ion mediated phase transitions. Furthermore, this work culminated in the demonstration of two life-mimicking attributes viz, macroscopic self-organization of gels⁶ and rapid self-healing gels.

References

1. Agarwal U S, Dutta A, Mashelkar R A, Migration of macromolecules under flow - the physical origin and engineering implications, *Chemical Engineering Science*, 49(11), 1994, 1693-1717. (Citations: 101)
2. Ravindranath K, Mashelkar R A, Polyethylene Terephthalate .1. Chemistry, thermodynamics and transport-properties, *Chemical Engineering Science*, 41(9), 1986, 2197-2214. (Citations: 64)
3. Devotta I, Ambekar V D, Mandhare A B, Mashelkar R A, The life time of a dissolving polymeric particle, *Chemical Engineering Science*, 49(5), 1994, 645-654. (Citations: 38)
4. Lele A K, Badiger M V, Hirve M M, Mashelkar R A, Thermodynamics of hydrogen-bonded polymer gel-solvent systems, *Chemical Engineering Science*, 50(22), 1995, 3535-3545. (Citations: 35)
5. Varghese S, Lele A K, Mashelkar R A, Designing new thermoreversible gels by molecular tailoring of hydrophilic-hydrophobic interactions, *Journal of Chemical Physics*, 112(6), 2000, 3063-3070. (Citations: 27)
6. Varghese S, Lele A K, Srinivas D, Sastry M, Mashelkar R A, Novel macroscopic self-organization in polymer gels, *Advanced Materials*, 13(20), 2001, 1544. (Citations: 17)

Leading 70 research papers by total citations & average citations per year

Sl. No.	Citations	Lab	Publications	ACPY*
1	944	CSIR-IITR	Kakkar, P; Das, B; Viswanathan, PN, A modified spectrophotometric assay of superoxide-dismutase, <i>Indian Journal of Biochemistry & Biophysics</i> , 1984	32.55
2	667	CSIR-NCL	Joshi, CP, An inspection of the domain between putative tata box and translation start site in 79 plant genes, <i>Nucleic Acids Research</i> , 1987	25.65
3	534	CSIR-NPL	Ramanathan, V; Crutzen, PJ; Lelieveld, J; Mitra, AP; Althausen, D; Anderson, J; Andreae, MO; Cantrell, W; Cass, GR; Chung, CE; Clarke, AD; Coakley, JA; Collins, WD; Conant, WC; Dulac, F; Heintzenberg, J; Heymsfield, AJ; Holben, B; Howell, S; Hudson, J; Jayaraman, A; Kiehl, JT; Krishnamurti, TN; Lubin, D; McFarquhar, G; Novakov, T; Ogren, JA; Podgorny, IA; Prather, K; Priestley, K; Prospero, JM; Quinn, PK; Rajeev, K; Rasch, P; Rupert, S; Sadourny, R; Satheesh, SK; Shaw, GE; Sheridan, P; Valero, FPJ, Indian Ocean Experiment: An integrated analysis of the climate forcing and effects of the great Indo-Asian haze, <i>Journal of Geophysical Research-Atmospheres</i> , 2001	44.50
4	453	CSIR-NCL	Shankar, SS; Rai, A; Ankamwar, B; Singh, A; Ahmad, A; Sastry, M, Biological synthesis of triangular gold nanoparticles, <i>Nature Materials</i> , 2004	50.33
5	396	CSIR-IICT	Choudary, BM; Madhi, S; Chowdari, NS; Kantam, ML; Sreedhar, B, Layered double hydroxide supported nanopalladium catalyst for Heck-, Suzuki-, Sonogashira-, and Stille-type coupling reactions of chloroarenes, <i>Journal of the American Chemical Society</i> , 2002	36.00
6	377	CSIR-CCMB	Pal-Bhadra, M; Leibovitch, BA; Gandhi, SG; Rao, M; Bhadra, U; Birchler, JA; Elgin, SCR, Heterochromatic silencing and HP1 localization in Drosophila are dependent on the RNAi machinery, <i>Science</i> , 2004	41.88
7	356	CSIR-NCL	Galgali, G; Ramesh, C; Lele, A, A rheological study on the kinetics of hybrid formation in polypropylene nanocomposites, <i>Macromolecules</i> , 2001	29.66
8	336	CSIR-NCL	Shukla, R; Bansal, V; Chaudhary, M; Basu, A; Bhonde, RR; Sastry, M, Biocompatibility of gold nanoparticles and their endocytotic fate inside the cellular compartment: A microscopic overview, <i>Langmuir</i> , 2005	42.00
9	311	CSIR-IITR	Mohan, D; Singh, KP, Single- and multi-component adsorption of cadmium and zinc using activated carbon derived from bagasse - an agricultural waste, <i>Water Research</i> , 2002	28.27

*ACPY - Average Citations Per Year

Sl. No.	Citations	Lab	Publications	ACPY*
10	311	CSIR-NPL	Lelieveld, J; Crutzen, PJ; Ramanathan, V; Andreae, MO; Brenninkmeijer, CAM; Campos, T; Cass, GR; Dickerson, RR; Fischer, H; de Gouw, JA; Hansel, A; Jefferson, A; Kley, D; de Laat, ATJ; Lal, S; Lawrence, MG; Lobert, JM; Mayol-Bracero, OL; Mitra, AP; Novakov, T; Oltmans, SJ; Prather, KA; Reiner, T; Rodhe H; Scheeren, HA; Sikka, D; Williams, J, The Indian Ocean Experiment: Widespread air pollution from South and Southeast Asia, <i>Science</i> , 2001	25.91
11	308	CSIR-CFTRI	Jayaprakasha, GK; Singh, RP; Sakariah, KK, Antioxidant activity of grape seed (<i>Vitis vinifera</i>) extracts on peroxidation models in vitro, <i>Food Chemistry</i> , 2001	25.66
12	261	CSIR-CFTRI	Singh, RP; Murthy, KNC; Jayaprakasha, GK, Studies on the antioxidant activity of pomegranate (<i>Punica granatum</i>) peel and seed extracts using in vitro models, <i>Journal of Agricultural and Food Chemistry</i> , 2002	23.72
13	259	CSIR-NCL	Sathish, M; Viswanathan, B; Viswanath, RP; Gopinath, CS, Synthesis, characterization, electronic structure, and photocatalytic activity of nitrogen-doped TiO ₂ nanocatalyst, <i>Chemistry of Materials</i> , 2005	32.37
14	247	CSIR-NCL	Ahmad, A; Mukherjee, P; Senapati, S; Mandal, D; Khan, MI; Kumar, R; Sastry, M, Extracellular biosynthesis of silver nanoparticles using the fungus <i>Fusarium oxysporum</i> , <i>Colloids and Surfaces B-Biointerfaces</i> , 2003	24.69
15	243	CSIR-NIIST	Sudeep, PK; Joseph, STS; Thomas, KG, Selective detection of cysteine and glutathione using gold nanorods, <i>Journal of the American Chemical Society</i> , 2005	30.37
16	240	CSIR-NIIST	Thomas, KG; Barazzouk, S; Ipe, BI; Joseph, STS; Kamat, PV, Uniaxial plasmon coupling through longitudinal self-assembly of gold nanorods, <i>Journal of Physical Chemistry B</i> , 2004	26.66
17	236	CSIR-IICT	Reddy, CV; Mahesh, M; Raju, PVK; Babu, TR; Reddy, VVN, Zirconium(IV) chloride catalyzed one-pot synthesis of 3,4-dihydropyrimidin-2(1H)-ones, <i>Tetrahedron Letters</i> , 2002	21.45
18	235	CSIR-IMTECH	Singh, H; Raghava, GPS, ProPred: prediction of HLA-DR binding sites, <i>Bioinformatics</i> , 2001	19.58
19	233	CSIR-NCL	Mukherjee, P; Ahmad, A; Mandal, D; Senapati, S; Sainkar, SR; Khan, MI; Ramani, R; Parischa, R; Ajayakumar, PV; Alam, M; Sastry, M; Kumar, R, Bioreduction of AuCl ₄ ⁻ ions by the fungus, <i>Verticillium</i> sp. and surface trapping of the gold nanoparticles formed, <i>Angewandte Chemie-International Edition</i> , 2001	19.41

Sl. No.	Citations	Lab	Publications	ACPY
20	230	CSIR-NCL	Shankar, SS; Rai, A; Ahmad, A; Sastry, M, Rapid synthesis of Au, Ag, and bimetallic Au core-Ag shell nanoparticles using Neem (<i>Azadirachta indica</i>) leaf broth, <i>Journal of Colloid and Interface Science</i>, 2004	25.55
21	227	CSIR-NCL	Kumar, PM; Badrinarayanan, S; Sastry, M, Nanocrystalline TiO ₂ studied by optical, FTIR and X-ray photoelectron spectroscopy: correlation to presence of surface states, <i>Thin Solid Films</i>, 2000	17.46
22	225	CSIR-NCL	Mukherjee, P; Ahmad, A; Mandal, D; Senapati, S; Sainkar, SR; Khan, MI; Parishcha, R; Ajaykumar, PV; Alam, M; Kumar, R; Sastry, M, Fungus-mediated synthesis of silver nanoparticles and their immobilization in the mycelial matrix: A novel biological approach to nanoparticle synthesis, <i>Nano Letters</i>, 2001	18.75
23	218	CSIR-NCL	Katti, MV; Ranjekar, PK; Gupta, VS, Differential distribution of simple sequence repeats in eukaryotic genome sequences, <i>Molecular Biology and Evolution</i>, 2001	18.16
24	217	CSIR-NBRI	Dixit, V; Pandey, V; Shyam, R, Differential antioxidative responses to cadmium in roots and leaves of pea (<i>Pisum sativum</i> L. cv. Azad), <i>Journal of Experimental Botany</i>, 2001	18.08
25	216	CSIR-NCL	Deshmukh, RR; Rajagopal, R; Srinivasan, KV, Ultrasound promoted C-C bond formation: Heck reaction at ambient conditions in room temperature ionic liquids, <i>Chemical Communications</i>, 2001	18.00
26	215	CSIR-NIIST	Ajayaghosh, A; George, SJ, First phenylenevinylene based organogels: Self-assembled nanostructures via cooperative hydrogen bonding and pi-stacking, <i>Journal of the American Chemical Society</i>, 2001	17.91
27	214	CSIR-CSMCRI	Jose, DA; Kumar, DK; Ganguly, B; Das, A, Efficient and simple colorimetric fluoride ion sensor based on receptors having urea and thiourea binding sites, <i>Organic Letters</i>, 2004	23.77
28	213	CSIR-NCL	Chandran, SP; Chaudhary, M; Pasricha, R; Ahmad, A; Sastry, M, Synthesis of gold nanotriangles and silver nanoparticles using Aloe vera plant extract, <i>Biotechnology Progress</i>, 2006	30.42
29	197	CSIR-NCL	Kumar, A; Mandal, S; Selvakannan, PR; Pasricha, R; Mandale, AB; Sastry, M, Investigation into the interaction between surface-bound alkylamines and gold nanoparticles, <i>Langmuir</i>, 2003	19.69

Sl. No.	Citations	Lab	Publications	ACPY
30	195	CSIR-NCL	Paraskar, AS; Dewkar, GK; Sudalai, A, Cu(OTf) ₂ : a reusable catalyst for high-yield synthesis of 3,4-dihydropyrimidin-2 (1H)-ones, <i>Tetrahedron Letters</i> , 2003	19.50
31	190	CSIR-IICT	Yadav, JS; Reddy, BVS; Murthy, CVSR; Kumar, GM; Madan, C, Lithium perchlorate catalyzed reactions of indoles: An expeditious synthesis of bis(indolyl)methanes, <i>Synthesis-Stuttgart</i> , 2001	15.83
32	180	CSIR-NCL	Shankar, SS; Rai, A; Ahmad, A; Sastry, M, Controlling the optical properties of lemongrass extract synthesized gold nanotriangles and potential application in infrared-absorbing optical coatings, <i>Chemistry of Materials</i> , 2005	22.50
33	177	CSIR-NCL	Ahmad, A; Senapati, S; Khan, MI; Kumar, R; Sastry, M, Extracellular biosynthesis of monodisperse gold nanoparticles by a novel extremophilic actinomycete, thermomonospora sp., <i>Langmuir</i> , 2003	17.69
34	175	CSIR-NEERI	Li, D; Haneda, H; Labhsetwar, NK; Hishita, S; Ohashi, N, Visible-light-driven photocatalysis on fluorine-doped TiO ₂ powders by the creation of surface oxygen vacancies, <i>Chemical Physics Letters</i> , 2005	21.87
35	174	CSIR-IITR	Singh, KP; Malik, A; Mohan, D; Sinha, S, Multivariate statistical techniques for the evaluation of spatial and temporal variations in water quality of Gomti river (India) - A case study, <i>Water Research</i> , 2004	19.33

Leading 70 research papers by average citations per year

Sl. No.	ACPY	Lab	Publications	Citations
36	30.50	CSIR-CCMB	Reich, D; Thangaraj, K; Patterson, N; Price, AI; Singh, L, Reconstructing Indian Population History, <i>Nature</i> , 2009	122
37	30.00	CSIR-CCMB	Ehret, GB; Munroe, PB; Rice, KM; Bochud, M; Johnson, AD; Chasman, DI; Smith, AV; Tobin, MD; Verwoert, GC; Hwang, SJ; Pihur, V; Vollenweider, P; O'Reilly, PF; Amin, N; Bragg-Gresham, JL; Teumer, A; Glazer, NL; Launer, L; Zhao, JH; Aulchenko, Y; Heath, S; Sober, S; Parsa, A; Luan, JA; Arora, P; Dehghan, A; Zhang, F; Lucas, G; Hicks, AA; Jackson, AU; Peden, JF; Tanaka, T; Wild, SH; Rudan, I; Igl, W; Milaneschi, Y; Parker, AN; Fava, C; Chambers, JC; Fox, ER; Kumari, M; Go, MJ; van der Harst, P; Kao, WHL; Sjogren, M; Vinay, DG; Alexander, M; Tabara, Y; Shaw-Hawkins, S; Whincup, PH; Liu, YM; Shi, G; Kuusisto, J; Tayo, B; Seielstad, M; Sim, X; Nguyen, KDH; Lehtimaki, T; Matullo, G; Wu, Y;	60

Gaunt, TR; Onland-Moret, NC; Cooper, MN; Platou, CGP;
 Org, E; Hardy, R; Dahgam, S; Palmen, J; Vitart, V; Braund,
 PS; Kuznetsova, T; Uiterwaal, CSPM; Adeyemo, A; Palmas,
 W; Campbell, H; Ludwig, B; Tomaszewski, M; Tzoulaki, I;
 Palmer, ND; Aspelund, T; Garcia, M; Chang, YPC; O'Connell,
 JR; Steinle, NI; Grobbee, DE; Arking, DE; Kardia, SL;
 Morrison, AC; Hernandez, D; Najjar, S; McArdle, WL; Hadley,
 D; Brown, MJ; Connell, JM; Hingorani, AD; Day, INM; Lawlor,
 DA; Beilby, JP; Lawrence, RW; Clarke, R; Hopewell, JC;
 Ongen, H; Dreisbach, AW; Li, YL; Young, JH; Bis, JC;
 Kahonen, M; Viikari, J; Adair, LS; Lee, NR; Chen, MH; Olden,
 M; Pattaro, C; Bolton, JAH; Kottgen, A; Bergmann, S; Mooser,
 V; Chaturvedi, N; Frayling, TM; Islam, M; Jafar, TH; Erdmann,
 J; Kulkarni, SR; Bornstein, SR; Grassler, J; Groop, L; Voight,
 BF; Kettunen, J; Howard, P; Taylor, A; Guarrera, S; Ricceri, F;
 Emilsson, V; Plump, A; Barroso, IS; Khaw, KT; Weder, AB;
 Hunt, SC; Sun, YV; Bergman, RN; Collins, FS; Bonnycastle,
 LL; Scott, LJ; Stringham, HM; Peltonen, L; Perola, M;
 Vartiainen, E; Brand, SM; Staessen, JA; Wang, TJ; Burton,
 PR; Artigas, MS; Dong, YB; Snieder, H; Wang, XL; Zhu, HD;
 Lohman, KK; Rudock, ME; Heckbert, SR; Smith, NL; Wiggins,
 KL; Dumaty, A; Shriner, D; Veldre, G; Viigimaa, M; Kinra, S;
 Prabhakaran, D; Tripathy, V; Langeveld, CD; Rosengren, A;
 Thelle, DS; Corsi, AM; Singleton, A; Forrester, T; Hilton, G;
 McKenzie, CA; Salako, T; Iwai, N; Kita, Y; Ogiwara, T; Ohkubo,
 T; Okamura, T; Ueshima, H; Umemura, S; Eyheramendy, S;
 Meitinger, T; Wichmann, HE; Cho, YS; Kim, HL; Lee, JY; Scott,
 J; Sehmi, JS; Zhang, WH; Hedblad, B; Nilsson, P; Smith, GD;
 Wong, A; Narisu, N; Stancakova, A; Raffel, LJ; Yao, J;
 Kathiresan, S; O'Donnell, CJ; Schwartz, SM; Ikram, MA;
 Longstreth, WT; Mosley, TH; Seshadri, S; Shrine, NRG; Wain,
 LV; Morken, MA; Swift, AJ; Laitinen, J; Prokopenko, I; Zitting, P;
 Cooper, JA; Humphries, SE; Danesh, J; Rasheed, A; Goel, A;
 Hamsten, A; Watkins, H; Bakker, SJL; van Gilst, WH; Janipalli,
 CS; Mani, KR; Yajnik, CS; Hofman, A; Mattace-Raso, FUS;
 Oostra, BA; Demirkan, A; Isaacs, A; Rivadeneira, F; Lakatta,
 EG; Orru, M; Scuteri, A; Ala-Korpela, M; Kangas, AJ;
 Lyytikainen, LP; Soininen, P; Tukiainen, T; Wurtz, P; Ong, RTH;
 Dorr, M; Kroemer, HK; Volker, U; Volzke, H; Galan, P; Hercberg,
 S; Lathrop, M; Zelenika, D; Deloukas, P; Mangino, M; Spector,
 TD; Zhai, GJ; Meschia, JF; Nalls, MA; Sharma, P; Terzic, J;
 Kumar, MVK; Denniff, M; Zukowska-Szczechowska, E;
 Wagenknecht, LE; Fowkes, FGR; Charchar, FJ; Schwarz, PEH;
 Hayward, C; Guo, XQ; Rotimi, C; Bots, ML; Brand, E; Samani,
 NJ; Polasek, O; Talmud, PJ; Nyberg, F; Kuh, D; Laan, M;
 Hveem, K; Palmer, LJ; van der Schouw, YT; Casas, JP; Mohlke,
 KL; Vineis, P; Raitakari, O; Ganesh, SK; Wong, TY; Tai, ES;
 Cooper, RS; Laakso, M; Rao, DC; Harris, TB; Morris, RW;
 Dominiczak, AF; Kivimaki, M; Marmot, MG; Miki, T; Saleheen,
 D; Chandak, GR; Coresh, J; Navis, G; Salomaa, V; Han, BG;

Sl. No.	ACPY	Lab	Publications	Citations
			Zhu, XF; Kooner, JS; Melander, O; Ridker, PM; Bandinelli, S; Gyllensten, UB; Wright, AF; Wilson, JF; Ferrucci, L; Farrall, M; Tuomilehto, J; Pramstaller, PP; Elosua, R; Soranzo, N; Sijbrands, EJG; Altshuler, D; Loos, RJF; Shuldiner, AR; Gieger, C; Meneton, P; Uitterlinden, AG; Wareham, NJ; Gudnason, V; Rotter, JI; Rettig, R; Uda, M; Strachan, DP; Witteman, JCM; Hartikainen, AL; Beckmann, JS; Boerwinkle, E; Vasan, RS; Boehnke, M; Larson, MG; Jarvelin, MR; Psaty, BM; Abecasis, GR; Chakravarti, A; Elliott, P; van Duijn, CM; Newton-Cheh, C; Levy, D; Caulfield, MJ; Johnson, T, Genetic Variants In Novei Pathways Influence Blood Pressure And Cardiovascular Disease Risk, <i>Nature</i> , 2011	
38	24.66	CSIR-IICT	Reddy, PY; Giribabu, L; Lyness, C; Snaith, HJ; Vijaykumar, C; Chandrasekharam, M; Lakshmikantam, M; Yum, JH; Kalyanasundaram, K; Graetzel, M; Nazeeruddin, MK, Efficient sensitization of nanocrystalline Tio2 films by a near-ir-absorbing unsymmetrical zinc poththalocyanine, <i>Angewandte Chemie-International Edition</i> , 2007	148
39	24.33	CSIR-IICT	Chen, WF; Yan, LF; Bangal, PR, Preparation of graphene by the rapid and mild thermal reduction of graphene oxide induced by microwaves, <i>Carbon</i> , 2010	73
40	23.00	CSIR-NPL	Pasricha, R; Gupta, S; Srivastava, AK, a facile and novel synthesis of Ag-Graphene-based nanocomposites, <i>SMALL</i> , 2009	92
41	22.75	CSIR-IGIB	Abdulla, MA; Ahmed, I; Assawamakin, A; Bhak, J; Brahmachari, SK; Calacal, GC; Chaurasia, A; Chen, CH; Chen, JM; Chen, YT; Chu, JY; Cutiongco-de la Paz, EMC; De Ungria, MCA; Delfin, FC; Edo, J; Fuchareon, S; Ghang, H; Gojobori, T; Han, JS; Ho, SF; Hoh, BP; Huang, W; Inoko, H; Jha, P; Jinam, TA; Jin, L; Jung, J; Kangwanpong, D; Kampuansai, J; Kennedy, GC; Khurana, P; Kim, HL; Kim, K; Kim, S; Kim, WY; Kimm, K; Kimura, R; Koike, T; Kulawonganunchai, S; Kumar, V; Lai, PS; Lee, JY; Lee, S; Liu, ET; Majumder, PP; Mandapati, KK; Marzuki, S; Mitchell, W; Mukerji, M; Naritomi, K; Ngamphiw, C; Niikawa, N; Nishida, N; Oh, B; Oh, S; Ohashi, J; Oka, A; Ong, R; Padilla, CD; Palittapongarnpim, P; Perdigon, HB; Phipps, ME; Png, E; Sakaki, Y; Salvador, JM; Sandraling, Y; Scaria, V; Seielstad, M; Sidek, MR; Sinha, A; Srikummool, M; Sudoyo, H; Sugano, S; Suryadi, H; Suzuki, Y; Tabbada, KA; Tan, A; Tokunaga, K; Tongsima, S; Villamor, LP; Wang, E; Wang, Y; Wang, HF; Wu, JY; Xiao, HS; Xu, SH; Yang, JO; Shugart, YY; Yoo, HS; Yuan, WT; Zhao, GP; Zilfalil, BA, Mapping Human Genetic Diversity In Asia, <i>Science</i> , 2009	91

Sl. No.	ACPY	Lab	Publications	Citations
42	21.71	CSIR-IICT	Grimaud, C; Bantignies, F; Pal-Bhadra, M; Ghana, P; Bhadra, U; Cavalli, G, RNAi Components are required for nuclear clustering of polycomb group response 3 elements, <i>Cell</i> , 2006	152
43	20.71	CSIR-NEIST	Boruwa, J; Gogoi, N; Saikia, PP; Barua, NC, Catalytic Asymmetric Henry Reaction, <i>Tetrahedron-Asymmetry</i> , 2006	145
44	19.28	CSIR-NIIST	Nair, V; Vellalath, S; Poonoth, M; Suresh, E, N-Heterocyclic carbene-catalyzed reaction of chalcones and enals via homoenolate: an efficient Synthesis of 1,3,4-trisubstituted cyclopentenes, <i>Journal of the American Chemical Society</i> , 2006	135
45	19.25	CSIR-IITR	Sharma, V; Shukla, RK; Saxena, N; Parmar, D; Das, M; Dhawan, A, DNA damaging potential of zinc oxide nanoparticles in human epidermal cells, <i>Toxicology Letters</i> , 2009	77
46	19.00	CSIR-NPL	Malhotra, BD; Chaubey, A; Singh, SP, prospects of conducting polymers in biosensors, <i>Analytica Chimica Acta</i> , 2006	133
47	18.19	CSIR-IGIB	Brahmachari SK, Majumder PP, Mukerji M, Habib S, Dash D, Ray K, Bahl S, Singh L, Sharma A, Roychoudhury S, Chandak GR, Thangaraj K, Parmar D, Sengupta S, Bharadwaj D, Rath SK, Singh J, Jha GN, Virdi K, Rao VR, Sinha S, Singh A, Mitra AK, Mishra SK, Pasha Q, Sivasubbu S, Pandey R, Baral A, Singh PK, Sharma A, Kumar J, Stobdan T, Bhasin Y, Chauhan C, Hussain A, Sundaramoorthy E, Singh SP, Bandyopadhyay A, Dasgupta K, Reddy AK, Spurgeon CJ, Idris MM, Khanna V, Dhawan A, Anand M, Shankar R, Bharti RS, Singh M, Singh AP, Khan AJ, Shah PP, Pant AB, Kaur R, Bisht KK, Kumar A, Rajamanickam V, Wilson E, Thangadurai A, Jha PK, Maulik M, Makhija N, Rahim A, Sharma S, Chopra R, Rana P, Chidambaram M, Maitra A, Chawla R, Soni S, Khurana P, Khan MN, Sutar SD, Tuteja A, Narayansamy K, Shukla R, Prakash S, Mahurkar S, Radha Mani K, Hemavathi J, Bhaskar S, Khanna P, Ramalakshmi GS, Tripathi SM, Thakur N, Ghosh B, Kukreti R, Madan T, Verma R, Sudheer G, Mahajan A, Chavali S, Tabassum R, Grover S, Gupta M, Batra J, Kumar A, Nejatizadeh A, Vaid M, Das SK, Sharma S, Sharma M, Chatterjee R, Paul JA, Srivastava P, Rajput C, Mittal U, Singh M, Hariharan M, Das S, Chaudhuri K, Sengupta M, Acharya M, Bhattacharyya A, Saha A, Biswas A, Chaki M, Gupta A, Mukherjee S, Mookherjee S, Chattopadhyay I, Banerjee T, Chakravorty M, Misra C, Monadal G, Sengupta S, Dutta De D, Bajaj S, Deb I, Banerjee A, Chowdhury R, Banerjee D, Kumar D, Das SR, Tiwari S,	91

Sl. No.	ACPY	Lab	Publications	Citations
			Bharadwaj A, Khanna S, Ahmed I, Parveen S, Singh N, Dasgupta D, Bisht SS, Rajput R, Ghosh B, Kumar N, Chaurasia A, Abraham JK, Sinha A, Scaria V, Sethi TP, Mandal AK, Mukhopadhyay A. Genetic landscape of the people of India: a canvas for disease gene exploration, <i>Journal of Genetics</i> , 2008	
48	18.16	CSIR-CSMCRI	Singh, T; Kumar, A, Aggregation behavior of ionic liquids in aqueous solutions: effect of alkyl chain length, cations, and Anions, <i>Journal of Physical Chemistry B</i> , 2007	109
49	18.14	CSIR-IITR	Dhawan, A; Taurozzi, JS; Pandey, AK; Shan, WQ; Miller, SM; Hashsham, SA; Tarabara, VV, Stable colloidal dispersions of c-60 fullerenes in water: evidence for genotoxicity, <i>Environmental Science & Technology</i> , 2006	127
4/ 50	17.87	CSIR-CBRI	Gupta, VK; Saini, VK; Jain, N, Adsorption of As(III) from aqueous solutions by iron oxide-coated sand, <i>Journal of Colloid and Interface Science</i> , 2005	143
51	17.50	CSIR-CCMB	Khurana, R; Coleman, C; Lonescu-Zanetti, C; Carter, SA; Krishna, V; Grover, RK; Roy, R; Singh, S, Mechanism of Thioflavin T binding to amyloid fibrils, <i>Journal of Structural Biology</i> , 2005	140
52	17.50	CSIR-NPL	Bhagavannarayana, G; Ananthamurthy, RV; Budakoti, GC; Kumar, B; Bartwal, KS, A study of the effect of annealing on Fe-doped linbo3 by hrxrd, xrt and ft-ir, <i>Journal of Applied Crystallography</i> , 2005	140
53	17.37	CSIR-CCMB	Porel, S; Singh, S; Harsha, SS; Rao, DN; Radhakrishnan, TP, Nanoparticle-embedded polymer: in situ synthesis, free-standing films with highly monodisperse silver nanoparticles and optical limiting, <i>Chemistry of Materials</i> , 2005	139
54	17.33	CSIR-CDRI	Yadav, VK; Balaji, S; Suresh, PS; Liu, XS; LU, X; LI, ZS; Guo, XE; Mann, JJ; Balapure, AK; Gershon, MD; Medhamurthy, R; Vidal, M; Karsenty, G; Ducy, P, pharmacological inhibition of gut-derived serotonin synthesis is a potential bone anabolic treatment for osteoporosis, <i>Nature Medicine</i> , 2010	52
55	17.28	CSIR-NEIST	Gogol, P; Konwar, D, An efficient and one-pot synthesis of imidazolines and benzimidazoles via anaerobic oxidation of carbon-nitrogen bonds in water, <i>Tetrahedron Letters</i> , 2006	121
56	17.25	CSIR-CSMCRI	Suresh, M; Mishra, S; Mishra, SK; Suresh, E; Mandal AK; Shrivastav, A; Das, A, Resonance energy transfer approach and a new ratiometric probe for Hg ²⁺ in aqueous media and living organism, <i>Organic Letters</i> , 2009	69

Sl. No.	ACPY	Lab	Publications	Citations
57	17.25	CSIR-IICT	Reddy, VP; Kumar, AV; Swapna, K; Rao, KR, Nano indium oxide as a recyclable catalyst for c-s cross-coupling of thiols with aryl halides under ligand free conditions, <i>Organic Letters</i> , 2009	69
58	17.00	CSIR-NPL	Kaushika, A; Khan, R; Solanki, PR; Pandey, P; Alam J; Ahmad, S; Malhotra, BD, Iron oxide nanoparticles-chitosan composite based glucose biosensor, <i>Biosensors & Bioelectronics</i> , 2008	85
59	16.75	CSIR-CCMB	Thangaraj, K; Chaubey, G; Kivisild, T; Reddy, AG; Singh, VK; Rasalkar, AA; Singh, L, Reconstructing the origin of andaman islanders, <i>Science</i> , 2005	134
60	16.75	CSIR-NEERI	Li, D; Haneda, H; Hishita, S; Ohashi, N; Labhsetwar, NK, Fluorine-doped TiO ₂ powders prepared by spray pyrolysis and their improved photocatalytic activity for decomposition of gas-phase acetaldehyde, <i>Journal of Fluorine Chemistry</i> , 2005	134
61	16.50	CSIR-IICT	Bose, DS; Fatima, L; Meryyala, HB, Green chemistry approaches to the synthesis of 5-Alkoxy carbonyl-4-Aryl-3,4-Dihydropyrimidin-2(1H)-Ones by a three-component coupling of one-pot condensation reaction: comparison of ethanol, water, and solvent-free conditions, <i>Journal of Organic Chemistry</i> , 2003	165
62	16.42	CSIR-NIIST	Nair, V; Vellalath, S; Poonoth, M; Mohan, R; Suresh, E, N-Heterocyclic carbene catalyzed reaction of enals and 1,2-dicarbonyl compounds: stereoselective synthesis of spiro gamma-butyrolactones, <i>Organic Letters</i> , 2006	115
63	16.10	CSIR-IITR	Gupta, VK; Ali, I; Suhas; Mohan, D, Equilibrium uptake and sorption dynamics for the removal of a basic dye (basic red) using low-cost adsorbents, <i>Journal of Colloid and Interface Science</i> , 2003	161
64	16.00	CSIR-CCMB	Gluckman, PD; Hanson, MA; Bateson, P; Beedle, AS; Law, CM; Bhutta, ZA; Anokhin, KV; Bougneres, P; Chandak, GR; Dasgupta, P; Smith, GD; Ellison, PT; Forrester, TE; Gilbert, SF; Jablonka, E; Kaplan, H; Prentice, AM; Simpson, SJ; Uauy, R; West-Eberhard, MJ, towards a new developmental synthesis: adaptive developmental plasticity and human disease, <i>Lancet</i> , 2009	64
65	16.00	CSIR-CCMB	Dhandapany, PS; Sadayappan, S; Xue, YL; Powell, GT; Rani, DS; Nallari, P; Rai, TS; Khullar, M; Soares, P; Bahl, A; Tharkan, JM; Vaideeswar, P; Rathinavel, A; Narasimhan, C; Ayapati, DR; Ayub, Q; Mehdi, SQ; Oppenheimer, S; Richards,	64

Sl. No.	ACPY	Lab	Publications	Citations
			MB; Price, AL; Patterson, N; Reich, D; Singh, L; Tyler-Smith, C; Thangaraj, K, A Common MYBPC3 (Cardiac Myosin Binding Protein C) variant associated with cardiomyopathies in south asia, <i>Nature Genetics</i> , 2009	
66	15.90	CSIR-IICT	Sabitha, G; Reddy, GSKK; Reddy, CS; Yadav, JS, A novel TMSI-mediated synthesis of Hantzsch 1,4-dihydropyridines at ambient temperature, <i>Tetrahedron Letters</i> , 2003	159
67	15.88	CSIR-IICT	Choudary, BM; Ranganath, KVS; Pal, U; Kantam, ML; Sreedhar, B, Nanocrystalline MgO for asymmetric Henry and Michael reactions, <i>Journal of the American Chemical Society</i> , 2005	127
68	15.83	CSIR-IICT	Kantevari, S; Bantu, R; Nagarapu, L, HClO ₄ -SiO ₂ and PPA-SiO ₂ catalyzed efficient one-pot Knoevenagel condensation, Michael addition and cyclo-dehydration of dimedone and aldehydes in acetonitrile, aqueous and solvent free conditions: Scope and limitations, <i>Journal of Molecular Catalysis A-Chemical</i> , 2007	95
69	15.80	CSIR-CSIO	Rastogi, R; Kaushal, R; Tripathi, SK; Sharma, AL; Kaur, I; Bharadwaj, LM, Comparative study of carbon nanotube dispersion using surfactants, <i>Journal of Colloid and Interface Science</i> , 2008	79
70	15.78	CSIR-IICT	Smitha, B; Sridhar, S; Khan, AA, Polyelectrolyte complexes of chitosan and poly(acrylic acid) as proton exchange membranes for fuel cells, <i>Macromolecules</i> , 2004	142

Leading 70 research papers by total citations*

Sl. No.	Citations	Lab	Publications	ACPY
36	412	CSIR-CDRI	Dhar, ML; Dhar, MM; Dhawan, BN; Mehrotra, BN; Ray, C, Screening of indian plants for biological activity .I., <i>Indian Journal of Experimental Biology</i> , 1968	9.15
37	404	CSIR-NCL	Joshi, CP, Putative polyadenylation signals in nuclear genes of higher-plants - a compilation and analysis, <i>Nucleic Acids Research</i> , 1987	15.53
38	396	CSIR-CDRI	Sharma, OP, Antioxidant activity of curcumin and related compounds, <i>Biochemical Pharmacology</i> , 1976	10.70

*Not included in the list on page 9

Sl. No.	Citations	Lab	Publications	ACPY
39	343	CSIR-NIO	Platt, T; Sathyendranath, S, Oceanic primary production - estimation by remote-sensing at local and regional scales, <i>Science</i> , 1988	13.72
40	327	CSIR-CDRI	Srimal, RC; Dhawan, BN, Pharmacology of diferuloyl methane (curcumin), a nonsteroidal anti-inflammatory agent, <i>Journal of Pharmacy and Pharmacology</i> , 1973	8.17
41	298	CSIR-NAL	Mahadevan, S; Giridhar, A; Singh, AK, Calorimetric measurements on AS-SB-SE glasses, <i>Journal of Non-Crystalline Solids</i> , 1986	11.03
42	279	CSIR-NIO	Nair, RR; Ittekkot, V; Manganini, SJ; Ramaswamy, V; Haake, B; Degens, ET; Desai, BN; Honjo, S, Increased particle-flux to the deep ocean related to monsoons, <i>Nature</i> , 1989	11.62
43	226	CSIR-NCL	Thangaraj, A; Kumar, R; Mirajkar, SP; Ratnasamy, P, Catalytic properties of crystalline titanium silicalites .1. Synthesis and characterization of titanium-rich zeolites with MFI structure, <i>Journal of Catalysis</i> , 1991	10.27
44	226	CSIR-NCL	Reddy, JS; Kumar, R; Ratnasamy, P, Titanium silicalite-2 - synthesis, characterization and catalytic properties, <i>Applied Catalysis</i> , 1990	9.82
45	224	CSIR-NPL	Narang, U; Prasad, PN; Bright, FV; Ramanathan, K; Kumar, ND; Malhotra, BD; Kamalasanan, MN; Chandra, S, Glucose biosensor based on a sol-gel-derived platform, <i>Analytical Chemistry</i> , 1994	11.78
46	213	CSIR-IICB	Nandy, A, A new graphical representation and analysis of DNA-sequence structure .1. Methodology and application to globin genes, <i>Current Science</i> , 1994	11.21
47	210	CSIR-CLRI	Balasubramanian, K; Prathiba, V, Quinolinium dichromate - a new reagent for oxidation of alcohols, <i>Indian Journal of Chemistry Section B-Organic Chemistry including Medicinal Chemistry</i> , 1986	7.77
48	206	CSIR-IMMT	Pattnaik, S; Subramanyam, VR; Bapaji, M; Kole, CR, Antibacterial and antifungal activity of aromatic constituents of essential oils, <i>Microbios</i> , 1997	12.87
49	203	CSIR-NIO	Haake, B; Ittekkot, V; Rixen, T; Ramaswamy, V; Nair, RR; Curry, WB, Seasonality and interannual variability of particle fluxes to the deep arabian sea, <i>Deep-Sea Research Part I-Oceanographic Research Papers</i> , 1993	10.15

Sl. No.	Citations	Lab	Publications	ACPY
50	202	CSIR-NIIST	Joseph, K; Thomas, S; Pavithran, C, Effect of chemical treatment on the tensile properties of short sisal fibre-reinforced polyethylene composites, <i>Polymer</i> , 1996	11.88
51	198	CSIR-IICB	Randic, M; Vracko, M; Nandy, A; Basak, SC, On 3-D graphical representation of DNA primary sequences and their numerical characterization, <i>Journal of Chemical Information and Computer Sciences</i> , 2000	15.23
52	198	CSIR-NIO	Naqvi, SWA; Jayakumar, DA; Narvekar, PV; Naik, H; Sarma, VVSS; D'Souza, W; Joseph, S; George, MD, Increased marine production of N ₂ O due to intensifying anoxia on the Indian continental shelf, <i>Nature</i> , 2000	15.23
53	191	CSIR-NIO	Madhupratap, M; Kumar, SP; Bhattathiri, PMA; Kumar, MD; Raghukumar, S; Nair, KKC; Ramaiah, N, Mechanism of the biological response to winter cooling in the northeastern Arabian Sea, <i>Nature</i> , 1996	11.23
54	190	CSIR-CFTRI	Reddy, ACP; Lokesh, BR, Studies on spice principles as antioxidants in the inhibition of lipid-peroxidation of rat-liver microsomes, <i>Molecular and Cellular Biochemistry</i> , 1992	9.04
55	189	CSIR-NAL	Jayarama, A; Singh, AK; Chatterj, A; Devi, SU, Pressure-volume relationship and pressure-induced electronic and structural transformations in EU and YB monochalcogenides, <i>Physical Review B</i> , 1974	4.84
56	180	CSIR-NCL	Gupta, AS; Dev, S, Chromatography of organic compounds .1.Thin-layer chromatography of olefins, <i>Journal of Chromatography</i> , 1963	3.60
57	180	CSIR-NCL	Mukherjee, S; Ranganathan, R; Anilkumar, PS; Joy, PA, Static and dynamic response of cluster glass in La _{0.5} Sr _{0.5} CoO ₃ , <i>Physical Review B</i> , 1996	10.58
58	178	CSIR-CFTRI	Joe, B; Lokesh, BR, Role of capsaicin, curcumin and dietary-n - 3 fatty-acids in lowering the generation of reactive oxygen species in rat peritoneal-macrophages, <i>Biochimica Et Biophysica Acta-Molecular Cell Research</i> , 1994	9.36
59	178	CSIR-CGCRI	Mitra, P; Chatterjee, AP; Maiti, HS, ZnO thin film sensor, <i>Materials Letters</i> , 1998	11.86
60	178	CSIR-NPL	Lal, K; Bhagavannarayana, G, A high-resolution diffuse-x-ray scattering study of defects in dislocation-free silicon-crystals grown by the float-zone method and comparison with czochralski-grown crystals, <i>Journal of Applied Crystallography</i> , 1989	7.41

Sl. No.	Citations	Lab	Publications	ACPY
61	176	CSIR-NBRI	Nautiyal, CS, An efficient microbiological growth medium for screening phosphate solubilizing microorganisms, <i>FEMS Microbiology Letters</i> , 1999	12.57
62	174	CSIR-CDRI	Poptani, H; Gupta, RK; Gupta, K; Roy, R; Pandey, R; Jain, VK; Chhabra, DK, Characterization of intracranial mass lesions with in-vivo proton MR spectroscopy, <i>American Journal of Neuroradiology</i> , 1995	9.66
63	173	CSIR-NAL	Singh, AK, The lattice strains in a specimen (cubic system) compressed nonhydrostatically in an opposed anvil device, <i>Journal of Applied Physics</i> , 1993	8.65
64	172	CSIR-IICT	Yadav, JS; Reddy, BVS; Srinivas, R; Venugopal, C; Ramalingam, T, Liclo4-catalyzed one-pot synthesis of dihydropyrimidinones: An improved protocol for biginelli reaction, <i>Synthesis-Stuttgart</i> , 2001	14.33
65	172	CSIR-NPL	Barrow, DA; Petroff, TE; Tandon, RP; Sayer, M, Characterization of thick lead zirconate titanate films fabricated using a new sol gel based process, <i>Journal of Applied Physics</i> , 1997	10.75
66	171	CSIR-CCMB	Jacob, ST; Bhargava, PM, New method for preparation of liver cell suspensions, <i>Experimental Cell Research</i> , 1962	3.35
67	170	CSIR-NCL	Mukherjee, P; Senapati, S; Mandal, D; Ahmad, A; Khan, MI; Kumar, R; Sastry, M, Extracellular synthesis of gold nanoparticles by the fungus <i>Fusarium oxysporum</i> , <i>Chembiochem</i> , 2002	15.45
68	170	CSIR-NGRI	Radhakrishna, BP; Naqvi, SM, Precambrian continental-crust of india and its evolution, <i>Journal of Geology</i> , 1986	6.29
69	169	CSIR-CECRI	Dhanaraj, J; Jagannathan, R; Kutty, TRN; Lu, CH, photoluminescence characteristics Of Y2O3 : Eu3+ nanophosphors prepared using sol-gel thermolysis, <i>Journal of Physical Chemistry B</i> , 2001	14.08
70	168	CSIR-NCL	Gole, A; Dash, C; Ramakrishnan, V; Sainkar, SR; Mandale, AB; Rao, M; Sastry, M, Pepsin-gold colloid conjugates: Preparation, characterization and enzymatic activity, <i>Langmuir</i> , 2001	14.00

List of 70 leading CSIR review papers by both citations and ACPY

Sl. No.	Citations	Lab	Publications	ACPY
1	687	CSIR-CIMAP	Agrawal, PK, NMR-Spectroscopy in the structural elucidation of oligosaccharides and glycosides, <i>Phytochemistry</i> , 1992	32.71
2	659	CSIR-IITR	Mohan, D; Pittman, CU; Steele, PH, Pyrolysis of wood/biomass for bio-oil: A critical review, <i>Energy & Fuels</i> , 2006	94.14
3	653	CSIR-IICB	Mahato, SB; Kundu, AP, C-13 NMR-spectra of pentacyclic triterpenoids - a compilation and some salient features, <i>Phytochemistry</i> , 1994	34.36
4	564	CSIR-NCL	Rao, MB; Tanksale, AM; Ghatge, MS; Deshpande, VV, Molecular and biotechnological aspects of microbial proteases, <i>Microbiology and Molecular Biology Reviews</i> , 1998	37.60
5	546	CSIR-NCL	Shaikh, AAG; Sivaram, S, Organic carbonates, <i>Chemical Reviews</i> , 1996	32.11
6	509	CSIR-CIMAP	Agrawal, PK; Jain, DC; Gupta, RK; Thakur, RS, C-13 NMR spectral investigations .10. C-13 NMR-spectroscopy of steroidal saponinins and steroidal saponins, <i>Phytochemistry</i> , 1985	18.17
7	486	CSIR-NPL	Gerard, M; Chaubey, A; Malhotra, BD, Application of conducting polymers to biosensors, <i>Biosensors & Bioelectronics</i> , 2002	44.18
8	464	CSIR-IMTECH	Banat, IM; Makkar, RS; Cameotra, SS, Potential commercial applications of microbial surfactants, <i>Applied Microbiology and Biotechnology</i> , 2000	35.69
9	416	CSIR-CDRI	Dhawan, BN; Cesselin, F; Raghubir, R; Reisine, T; Bradley, PB; Portoghese, PS; Hamon, M, International union of pharmacology .12. Classification of opioid receptors, <i>Pharmacological Reviews</i> , 1996	24.47
10	413	CSIR-IITR	Mohan, D; Pittman, CU, Arsenic removal from water/waste water using adsorbents-A critical review, <i>Journal of Hazardous Materials</i> , 2007	68.83
11	382	CSIR-NIIST	Thomas, KG; Kamat, PV, Chromophore-functionalized gold nanoparticles, <i>Accounts of Chemical Research</i> , 2003	38.20
12	376	CSIR-NCL	Saheb, DN; Jog, JP, Natural fiber polymer composites: A review, <i>Advances in Polymer Technology</i> , 1999	26.85

Sl. No.	Citations	Lab	Publications	ACPY
13	354	CSIR-NCL	Kulkarni, N; Shendye, A; Rao, M, Molecular and biotechnological aspects of xylanases, <i>FEMS Microbiology Reviews</i> , 1999	25.28
14	347	CSIR-NIIST	Ajayaghosh, A; Praveen, VK, pi-organogels of self-assembled p-phenylenevinylenes: Soft materials with distinct size, shape, and functions, <i>Accounts of Chemical Research</i> , 2007	57.83
15	326	CSIR-IICT	Smitha, B; Sridhar, S; Khan, AA, Solid polymer electrolyte membranes for fuel cell applications - a review, <i>Journal of Membrane Science</i> , 2005	40.75
16	319	CSIR-NIIST	Pandey, A; Soccol, CR; Mitchell, D, New developments in solid state fermentation: I-bioprocesses and products, <i>Process Biochemistry</i> , 2000	24.53
17	304	CSIR-NIIST	George, M; Abraham, TE, Polyionic hydrocolloids for the intestinal delivery of protein drugs: Alginate and chitosan - a review, <i>Journal of Controlled Release</i> , 2006	43.42
18	297	CSIR-NIIST	Pandey, A; Selvakumar, P; Soccol, CR; Nigam, P, Solid state fermentation for the production of industrial enzymes, <i>Current Science</i> , 1999	21.21
19	290	CSIR-NCL	Varma, AJ; Deshpande, SV; Kennedy, JF, Metal complexation by chitosan and its derivatives: a review, <i>Carbohydrate Polymers</i> , 2004	32.22
20	288	CSIR-IITR	Maheshwari, RK; Singh, AK; Gaddipati, J; Srimal, RC, Multiple biological activities of curcumin: A short review, <i>Life Sciences</i> , 2006	41.14
21	285	CSIR-NIIST	Pandey, A; Nigam, P; Soccol, CR; Soccol, VT; Singh, D; Mohan, R, Advances in microbial amylases, <i>Biotechnology and Applied Biochemistry</i> , 2000	21.92
22	277	CSIR-IICB	Nandi, R; Sengupta, S, Microbial production of hydrogen: An overview, <i>Critical Reviews in Microbiology</i> , 1998	18.46
23	264	CSIR-NCL	Chaki, NK; Vijayamohanan, K, Self-assembled monolayers as a tunable platform for biosensor applications, <i>Biosensors & Bioelectronics</i> , 2002	24.00
24	262	CSIR-CDRI	Singh, V; Batra, S, Advances in the Baylis-Hillman reaction-assisted synthesis of cyclic frameworks, <i>Tetrahedron</i> , 2008	52.39
25	261	CSIR-CMERI	Chatterjee, D; Dasgupta, S, Visible light induced photocatalytic degradation of organic pollutants, <i>Journal of Photochemistry and Photobiology C-Photochemistry Reviews</i> , 2005	32.62

Sl. No.	Citations	Lab	Publications	ACPY
26	258	CSIR-NIIST	Nair, V; Bindu, S; Sreekumar, V, N-heterocyclic carbenes: Reagents, not just ligands!, <i>Angewandte Chemie-International Edition</i> , 2004	28.66
27	256	CSIR-NCL	Pandey, G; Banerjee, P; Gadre, SR, Construction of enantiopure pyrrolidine ring system via asymmetric [3+2]-cycloaddition of azomethine ylides, <i>Chemical Reviews</i> , 2006	36.57
28	253	CSIR-NCL	Choudhary, TV; Banerjee, S; Choudhary, VR, Catalysts for combustion of methane and lower alkanes, <i>Applied Catalysis A-General</i> , 2002	23.00
29	252	CSIR-NIIST	Pandey, A; Soccol, CR; Nigam, P; Soccol, VT, Biotechnological potential of agro-industrial residues. I: sugarcane bagasse, <i>Bioresource Technology</i> , 2000	19.38
30	247	CSIR-CEERI	Eranna, G; Joshi, BC; Runthala, DP; Gupta, RP, Oxide materials for development of integrated gas sensors - A comprehensive review, <i>Critical Reviews in Solid State and Materials Sciences</i> , 2004	27.44
31	245	CSIR-NIIST	Pandey, A; Benjamin, S; Soccol, CR; Nigam, P; Krieger, N; Soccol, VT, The realm of microbial lipases in biotechnology, <i>Biotechnology and Applied Biochemistry</i> , 1999	17.50
32	242	CSIR-IITR	Mohan, D; Pittman, CU, Activated carbons and low cost adsorbents for remediation of tri- and hexavalent chromium from water, <i>Journal of Hazardous Materials</i> , 2006	34.57
33	242	CSIR-NAL	Patil, KC; Aruna, ST; Mimani, T, Combustion synthesis: an update, <i>Current Opinion in Solid State & Materials Science</i> , 2002	22.00
34	241	CSIR-IMMT	Besra, L; Liu, M, A review on fundamentals and applications of electrophoretic deposition (EPD), <i>Progress in Materials Science</i> , 2007	40.16
35	236	CSIR-IMTECH	Samanta, SK; Singh, OV; Jain, RK, Polycyclic aromatic hydrocarbons: environmental pollution and bioremediation, <i>Trends in Biotechnology</i> , 2002	21.45
36	234	CSIR-NPL	Chaubey, A; Malhotra, BD, Mediated biosensors, <i>Biosensors & Bioelectronics</i> , 2002	21.27
37	232	CSIR-NIO	Codispoti, LA; Brandes, JA; Christensen, JP; Devol, AH; Naqvi, SWA; Paerl, HW; Yoshinari, T, The oceanic fixed nitrogen and nitrous oxide budgets: Moving targets as we enter the anthropocene?, <i>Scientia Marina</i> , 2001	19.33

Sl. No.	Citations	Lab	Publications	ACPY
38	217	CSIR-IGIB	Reddy, CSK; Ghai, R; Rashmi; Kalia, VC, Polyhydroxyalkanoates: an overview, <i>Bioresource Technology</i> , 2003	21.69
39	215	CSIR-NIIST	Yesodha, SK; Pillai, CKS; Tsutsumi, N, Stable polymeric materials for nonlinear optics: a review based on azobenzene systems, <i>Progress in Polymer Science</i> , 2004	23.88
40	210	CSIR-CFTRI	Tharanathan, RN, Biodegradable films and composite coatings: Past, present and future, <i>Trends in Food Science & Technology</i> , 2003	21.00
41	204	CSIR-CSMCRI	Bhattacharya, A; Misra, BN, Grafting: a versatile means to modify polymers - techniques, factors and applications, <i>Progress in Polymer Science</i> , 2004	22.66
42	197	CSIR-CFTRI	Joe, B; Vijaykumar, M; Lokesh, BR, Biological properties of curcumin-cellular and molecular mechanisms of action, <i>Critical Reviews in Food Science and Nutrition</i> , 2004	21.88
43	192	CSIR-CDRI	Mehta, SL; Manhas, N; Rahubir, R, Molecular targets in cerebral ischemia for developing novel therapeutics, <i>Brain Research Reviews</i> , 2007	32.00
44	191	CSIR-CFTRI	Tharanathan, RN; Kittur, FS, Chitin - The undisputed biomolecule of great potential, <i>Critical Reviews in Food Science and Nutrition</i> , 2003	19.10
45	185	CSIR-NIIST	Nair, V; Vellalath, S; Babu, BP, Recent advances in carbon-carbon bond-forming reactions involving homoenolates generated by NHC catalysis, <i>Chemical Society Reviews</i> , 2008	37.00
46	182	CSIR-NIIST	Subramaniyan, S; Prema, P, Biotechnology of microbial xylanases: Enzymology, molecular biology, and application, <i>Critical Reviews in Biotechnology</i> , 2002	16.54
47	180	CSIR-IICT	Smitha, B; Suhanya, D; Sridhar, S; Ramakrishna, M, Separation of organic-organic mixtures by pervaporation - a review, <i>Journal of Membrane Science</i> , 2004	20.00
48	168	CSIR-NCL	Pandey, JK; Reddy, KR; Kumar, AP; Singh, RP, An overview on the degradability of polymer nanocomposites, <i>Polymer Degradation and Stability</i> , 2005	21.00
49	156	CSIR-NIIST	Nair, V; Ros, S; Jayan, CN; Pillai, BS, Indium- and gallium-mediated carbon-carbon bond-forming reactions in organic synthesis, <i>Tetrahedron</i> , 2004	17.33

Sl. No.	Citations	Lab	Publications	ACPY
50	148	CSIR-NIIST	Nair, V; Menon, RS; Sreekanth, AR; Abhilash, N; Biju, AT, Engaging zwitterions in carbon-carbon and carbon-nitrogen bond-forming reactions: A promising synthetic strategy, <i>Accounts of Chemical Research</i> , 2006	21.14
51	147	CSIR-CECRI	Stephan, AM, Review on gel polymer electrolytes for lithium batteries, <i>European Polymer Journal</i> , 2006	21.00

List of CSIR review papers with ACPY

Sl. No.	ACPY	Lab	Publications	Citations
52	42.67	CSIR-IHBT	Kumari, A; Yadav, SK; Yadav, SC, Biodegradable polymeric nanoparticles based drug delivery systems, <i>Colloids and Surfaces B-Biointerfaces</i> , 2010	128
53	24.00	CSIR-CFTRI	Rastogi, NK; Raghavarao, KSMS; Balasubramaniam, VM; Niranjana, K; Knorr, D, Opportunities and challenges in high pressure processing of foods, <i>Critical Reviews in Food Science and Nutrition</i> , 2007	144
54	24.00	CSIR-IICT	Chattopadhyay, DK; Raju, KVS, Structural engineering of polyurethane coating for high performance applications, <i>Progress in Polymer Science</i> , 2007	144
55	24.00	CSIR-NIO	Collins, M; An, SI; Cai, WJ; Ganachaud, A; Guilyardi, E; Jin, FF; Jochum, M; Lengaigne, M; Power, S; Timmermann, A; Vecchi, G; Wittenberg, A, The impact of global warming on the tropical Pacific ocean and El Nino, <i>Nature Geoscience</i> , 2010	72
56	23.00	CSIR-IICT	Yamamoto, Y; Gridnev, ID; Patil, NT; Jin, T, Alkyne activation with Bronsted acids, iodine, or gold complexes, and its fate leading to synthetic application, <i>Chemical Communications</i> , 2009	92
57	21.17	CSIR-CFTRI	Prashanth, KVH; Tharanathan, RN, Chitin/chitosan: modifications and their unlimited application potential - an overview, <i>Trends in Food Science & Technology</i> , 2007	127
58	20.80	CSIR-IIP	Goyal, HB; Seal, D; Saxena, RC, Bio-fuels from thermochemical conversion of renewable resources: A review, <i>Renewable & Sustainable Energy Reviews</i> , 2008	104
59	20.33	CSIR-IPMD	Ahuja, T; Mir, IA; Kumar, D; Rajesh, Biomolecular immobilization on conducting polymers for biosensing applications, <i>Biomaterials</i> , 2007	122

Sl. No.	ACPY	Lab	Publications	Citations
60	19.75	CSIR-NCL	Kumar, AP; Depan, D; Tomer, NS; Singh, RP, Nanoscale particles for polymer degradation and stabilization-Trends and future perspectives, <i>Progress in Polymer Science</i> , 2009	79
61	19.20	CSIR-NIIST	Sebastian, MT; Jantunen, H, Low loss dielectric materials for LTCC applications: a review, <i>International Materials Reviews</i> , 2008	96
62	19.00	CSIR-CSMCR	Nagarale, RK; Gohil, GS; Shahi, VK, Recent developments on ion-exchange membranes and electro-membrane processes, <i>Advances in Colloid and Interface Science</i> , 2006	133
63	19.00	CSIR-NCL	Ogale, SB, Dilute doping, defects, and ferromagnetism in metal oxide systems, <i>Advanced Materials</i> , 2010	57
64	18.80	CSIR-CFTRI	Rajendran, S; Sriranjini, V, Plant products as fumigants for stored-product insect control, <i>Journal of Stored Products Research</i> , 2008	94
65	18.29	CSIR-IGIB	Kishore, U; Greenhough, TJ; Waters, P; Shrive, AK; Ghai, R; Kamran, MF; Bernal, AL; Reid, KBM; Madan, T; Chakraborty, T, Surfactant proteins SP-A and SP-D: Structure, function and receptors, <i>Molecular Immunology</i> , 2006	128
66	18.25	CSIR-CCMB	Dhawan, J; Rando, TA, Stem cells in postnatal myogenesis: molecular mechanisms of satellite cell quiescence, activation and replenishment, <i>Trends in Cell Biology</i> , 2005	146
67	17.50	CSIR-IICT	Karmali, PP; Chaudhuri, A, Cationic liposomes as non-viral carriers of gene medicines: Resolved issues, open questions, and future promises, <i>Medicinal Research Reviews</i> , 2007	105
68	16.88	CSIR-CDRI	Kumar, S; Bandyopadhyay, U, Free heme toxicity and its detoxification systems in human, <i>Toxicology Letters</i> , 2005	135
69	16.67	CSIR-NIIST	Nair, V; Deepthi, A, Cerium(IV) ammonium nitrate - A versatile single-electron oxidant, <i>Chemical Reviews</i> , 2007	100
70	16.57	CSIR-NCL	Mhaske, SB; Argade, NP, The chemistry of recently isolated naturally occurring quinazolinone alkaloids, <i>Tetrahedron</i> , 2006	116

List of leading 70 CSIR review papers by citations*

Sl. No.	Citations	Lab	Publications	ACPY
52	494	CSIR-NCL	Rao, AS; Paknikar, SK; Kirtane, JG, Recent advances in the preparation and synthetic applications of oxiranes, <i>Tetrahedron</i>, 1983	16.46
53	449	CSIR-NEIST	Bhattacharya, AK; Thyagarajan, G, The Michaelis-Arbuzov rearrangement, <i>Chemical Reviews</i>, 1981	14.03
54	250	CSIR-NIIST	Pandey; A, Recent process - developments in solid-state fermentation, <i>Process Biochemistry</i>, 1992	11.90
55	250	CSIR-CFTRI	Lonsane, BK; Ghildyal, NP; Budiartman, S; Ramakrishna, SV, Engineering aspects of solid-state fermentation, <i>Enzyme and Microbial Technology</i>, 1985	8.92
56	233	CSIR-NCL	Lohray, BB, Cyclic sulfites and cyclic sulfates - epoxide like synthons, <i>Synthesis-Stuttgart</i>, 1992	11.09
57	232	CSIR-NCL	Mukherjee, D; Pal, S, Use of cluster-expansion methods in the open-shell correlation-problem, <i>Advances in Quantum Chemistry</i>, 1989	9.66
58	230	CSIR-CFTRI	Govindarajan, VS, Turmeric - chemistry, technology, and quality, <i>CRC Critical Reviews in Food Science and Nutrition</i>, 1980	6.96
59	228	CSIR-CCMB	Saberwal, G; Nagaraj, R, Cell-lytic and antibacterial peptides that act by perturbing the barrier function of membranes - facets of their conformational features, structure-function correlations and membrane-perturbing abilities, <i>Biochimica Et Biophysica Acta-Reviews on Biomembranes</i>, 1994	12.00
60	206	CSIR-IIP	Ratnasamy, P; Sivasanker, S, Structural chemistry of co-mo-alumina catalysts, <i>Catalysis Reviews-Science and Engineering</i>, 1980	6.24
61	205	CSIR-NAL	Shankar, PN; Deshpande, MD, Fluid mechanics in the driven cavity, <i>Annual Review of Fluid Mechanics</i>, 2000	15.76
62	205	CSIR-IICT	Rao, AVR; Gurjar, MK; Reddy, KL; Rao, AS, Studies directed toward the synthesis of vancomycin and related cyclic-peptides, <i>Chemical Reviews</i>, 1995	11.38
63	183	CSIR-IIP	Nath, M; Pokharia, S; Yadav, R, Organotin(IV) complexes of amino acids and peptides, <i>Coordination Chemistry Reviews</i>, 2001	15.25

*Not included in the list on page 22

Sl. No.	Citations	Lab	Publications	ACPY
64	176	CSIR-CCMB	Sitaram, N; Nagaraj, R, Interaction of antimicrobial peptides with biological and model membranes: structural and charge requirements for activity, <i>Biochimica Et Biophysica Acta-Biomembranes</i> , 1999	12.57
65	163	CSIR-CFTRI	Rao, SR; Ravishankar, GA, Plant cell cultures: Chemical factories of secondary metabolites, <i>Biotechnology Advances</i> , 2002	14.81
66	161	CSIR-IICB	Basu, A; Mahata, J; Gupta, S; Giri, AK, Genetic toxicology of a paradoxical human carcinogen, arsenic: a review, <i>Mutation Research-Reviews in Mutation Research</i> , 2001	13.41
67	161	CSIR-IICB	Mahato, SB; Ganguly, AN; Sahu, NP, Steroid Saponins, <i>Phytochemistry</i> , 1982	5.19
68	156	CSIR-CCMB	Chatterji, D; Ojha, AK, Revisiting the stringent response, ppGpp and starvation signaling, <i>Current Opinion in Microbiology</i> , 2001	13.00
69	151	CSIR-IICT	Tietze, LF; Bell, HP; Chandrasekhar, S, Natural product hybrids as new leads for drug discovery, <i>Angewandte Chemie-International Edition</i> , 2003	15.10
70	147	CSIR-IMTECH	Singh, P; Cameotra, SS, Potential applications of microbial surfactants in biomedical sciences, <i>Trends in Biotechnology</i> , 2004	16.33