DR. SURESH KAUSHIK

Ph.D. (Molecular Biology and Biotechnology)
Ex-Chief Technical Officer (Research)
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SUMMARY

A scientific research expert with multidisciplinary approaches in various disciplines of agriculture such as molecular biology, biotechnology, genetic engineering, biochemistry, microbiology, soil science, environmental science, nanotechnology with more than 37 years of successful experience in research projects and programmes, lab administration and management, and teaching and guidance to students. I have worked on Bt-transgenic technology (GM crops) and elemental analysis including both nutrients and heavy metals in food, soil and biological matrices for safety issues and toxicological studies. Innovative solutions and leadership in modern and futuristic agriculture, healthcare sector, industrial sector, academic field, food science and environmental science are some my other strengths.

CAREER HIGHLIGHTS

- Technically astute, sincere & diligent professional with a comprehensive experience in Biotechnology, Molecular Biology, Biochemistry, Microbiology, Genetics and Molecular Soil Ecology.
- Expertise in Standard Molecular & Biochemical Techniques. Skilled in Bt-Transgenic Technology, Plant Genomics, Plant Tissue Culture, *Agrobacterium*-Mediated Transformation and Development & Evaluation of Genetically Modified Crops (GM crops).
- Well versed with development of biopesticides, biofertilizers, nanofertilizers, nanopesticides, biostimulants, soil conditioners etc.
- Well versed with sophisticated scientific instruments such as HPLC-ICP-MS, Atomic Absorption Spectrophotometer, Infra-red spectrometry (FTIR), Differential Thermal analyzer, Microwave digestor, Ion analyzer, GC, HPLC, Electrophoresis, SDS-PAGE, PCR, RT-PCR, Centrifugation, UV/visible spectrometer etc.
- Experience in setting up a Biotechnology Lab, Soil Testing lab and ICP-MS lab from scratch, from ordering consumables to instruments & subsequently validating all standard experiments.
- Deal confidently with difficult situations; highly motivated, dynamic, and single-minded in my pursuit of excellence and have a record for maintaining high standards of verity and precision in the organization.
- Ability to establish priorities and to plan, coordinate with team and monitor own work plan. Willingness to learn to keep and abreast of new developments with innovative ideas in modern agriculture.

TECHNICAL SKILLS

- **Molecular Techniques**: DNA and RNA Isolation, Southern Blotting, Probe Construction, Primer Designing, DNA Sequencing, PCR, RT-PCR, RAPD, RFLP, AFLP, SNP, Site-Directed Mutagenesis, Vector Design and Construction, Plasmid Preparation, Ligation, and Bacterial Transformation, Cloning and other basic Molecular Biology Techniques.
- **Biochemical Methods:** ELISA, Gel and Ion Exchange Chromatography, Affinity Purification, Western Blotting, SDS-PAGE
- **Microbiological Skills**: Estimation of Soil Microbial Population Size in Soil, Assessment of Genetic Structure of Bacterial Communities of Soil using 16S Ribosomal RNA (rRNA) Intergenic

Spacer Analysis (RISA) by PCR and Estimation of Enzymatic Activities such as Dehydrogenase, Nitrate Reductase, Alkaline Phosphatase etc.

- **Plant Tissue Culture**: *Agrobacterium*-Mediated Transformation, Micropropagation, Embryo culture, Somaclonal variation, Germplasm preservation, Industrial products from cell culture, Protoplasts Isolation and Regeneration, Development of Transgenic Plants, Plant Bioreactors for pharmaceuticals etc.
- **Soil & Plant Analysis**: Elemental analysis - Zn, Mn, Cu, Fe, Ni, Cd, Co, Cr, As, Ni, Mo, Pb, Hg, Ca, Mg, Na, K, S, P, B, Si, Al, Ag, Ti etc. using instruments such as ICP-MS, Atomic Absorption Spectrophotometer, Flame Photometer, UV/vis Spectrophotometer, Microwave Digester, etc.

EDUCATION

Ph.D.	Molecular Biology & Biotechnology Indian Agricultural Research Institute, Pusa, New Delhi	1995-2001
	Dissertation title: Molecular and Field Evaluation of Bt-Transgenic Brinjal (*Solanum melongena)*	
M.Sc.	Botany, Annamalai University, Tamil Nadu	1991-1993
B.Sc.	Botany, Chemistry & Zoology Maharishi Dayanand University, Rohtak, Haryana	1979-1983

EMPLOYMENT

ICP-MS and Soil Biotechnology Lab 1985 - 2023
Division of Soil Science & Agricultural Chemistry
Indian Agricultural Research Institute, New Delhi-110012
Chief Technical Officer (Research)

Jagson Pal Pharmaceuticals Ltd., Faridabad, Haryana 1983-1985
Analytical Chemist, Quality Control Laboratory

TEACHING/GUIDANCE

- Guiding Ph.D. (Biotechnology) students of Shri Venkateshwara University, Gajraula as a research supervisor
- Acting as an evaluator for Ph.D. thesis (Biotechnology/Biochemistry) of Shri Venkateshwara University, Gajraula
- Acting as a Reviewer for several International journals
- Acting as a Visiting Faculty and Research Supervisor in the subject of Biotechnology in Shri Venkateshwara University, Gajraula (Registration No. SVU/SC/2K11-14) since 28th September, 2011
- Guided and taught courses such as Plant Molecular Biology, Genetic Engineering, Biochemistry, Plant Biotechnology to M.Sc. students of Punjab Technical University, Jalandhar at New Delhi study centre for 10 years as a visiting guest faculty.

FELLOWSHIP/AWARDS

- Awarded an honorary membership of All India Council for Robotics and Automation's Technology Governance Steering Committee for Agriculture, **New Delhi, India**
- Awarded membership of Frontiers Editorial Board as a Review Editor for Plant Biotechnology section in Frontiers in Plant Science, **Switzerland**
- Awarded membership of Frontiers Editorial Board as a Review Editor for Environmental Nanotechnology section in the Journal of Frontiers in Nanotechnology, **Switzerland**

- Awarded the 'Certificate of Membership' by the Association for International Development of Academic and Scientific Cooperation (AIDASCO), **Serbia**
- Awarded a "Certificate of Reviewing" by the Editor-in-Chief of Journal of Plant Protection Research, **Poland**
- Awarded Qualified National Examination Test (NET) for Lectureship conducted jointly by Indian Council of Agricultural Research (ICAR) and Agricultural Research Scientist Board (ASRB), India
- Awarded Qualified National Examination Test (NET) for Lectureship conducted jointly by Council for Scientific and Industrial Research (CSIR) and University Grant Commission (UGC, India
- Recipient of Senior Research Fellowship sponsored by Indian Council of Agricultural Research (ICAR), New Delhi
- Recipient of National Merit Scholarship, India

INTERNATIONAL SEMINAR/SYMPOSIUM/WORKSHOP

- Attended 3rd Global Artificial Intelligence Summit and Awards (GAISA) - Global Summit and Awards 2022 during October 7-8, 2022 organized by All India Council for Robotics and Automation (AICRA) at Vigyan Bhawan, New Delhi, **India**
- Attended 2nd Global Artificial Intelligence Summit and Awards (GAISA) 2021 on "How AI would transform Agriculture Sector?" as a speaker panelist during 28-29 September, 2021 organized by NITI Aayog, Govt. of India and All India Council for Robotics and Automation (AICRA) at Vigyan Bhawan, New Delhi, **India**
- Presented a paper (virtual) "Nano-Biosensor Technology: Recent Advances for Smart Intelligent Agriculture" at the International Online Conference on Nano Materials (ICN 2021) held at Mahatma Gandhi University, Kottayam, Kerala, India during 09-11 April 2021 organized jointly by Mahatma Gandhi University, Kottayam, Kerala, **India**; Wroclaw University of Technology, Wroclaw, Poland; Gdansk University of Technology, **Poland**; and Wuhan University, **China**.
- Attended the 3rd "Taian Foreign Experts Conference" held during September 8-10, 2018 at Taian City, Shandong Province, **China**
- Attended and presented an oral paper in the International Conference on Environmental Pollution and Food Safety (EFS2017) held during September 28-29, 2017 at **Singapore**
- Attended and presented a paper as a keynote speaker in the International Workshop on "Innovation of Environmental Stress Management for Spice Crops" organized by Indonesian Agency of Agricultural Research, Ministry of Agriculture, Indonesia during August 25-27, 2015 held at Indonesian Spices and Medicinal Crops Research Institute (ISMECRI)/BALITTRO, Bogor, **Indonesia**.
- Attended and presented a poster paper in the International Congress of Plant Physiology on "Sustainable Plant Productivity under Changing Environment" organized by Indian Society for Plant Physiology, IARI, New Delhi during 8-12 January, 2003 held at New Delhi, **India**.

NATIONAL SEMINAR/SYMPOSIUM

- Global Artificial Intelligence Summit and Awards (GAISA) 2021 on "How AI would transform Agriculture Sector?" held at Vigyan Bhawan, New Delhi during 28-29 September, 2021 organized by NITI Aayog, Govt. of India and All India Council for Robotics and Automation (AICRA)
- National Consultation Meet of Key Stakeholders on "Zero Budget Natural Farming" held at India International Centre, New Delhi on October 1, 2019 organized by Indian Council of Food and Agriculture
- National Seminar on "Developments in Soil Sciences: 2013" and 78th Annual Convention of Indian Society of Soil Sciences at CAZRI, Jodhpur during October 23-26, 2013.
- National Seminar on "Developments in Soil Sciences: 2011" and 76th Annual Convention of Indian Society of Soil Sciences at Dharwad during November 16-19, 2011.
- National Seminar on "Developments in Soil Sciences: 2009" and 74th Annual Convention of Indian Society of Soil Sciences at New Delhi during December 22-25, 2009

- National Seminar on "Developments in Soil Sciences: 2008" and 73rd Annual Convention of Indian Society of Soil Sciences at Bangalore (Karnataka) during November 27-30, 2008.
- National Seminar on "Soil Testing for Balanced and Integrated Use of Fertilizers" during March 17-18, 2006 at Virology Auditorium, Division of Plant Pathology, IARI, New Delhi organized by Division of Soil Science and Agricultural Chemistry, IARI, New Delhi.
- National Seminar on "Developments in Soil Science: 2005" during September 28-October 01, 2005 organized by Indian Society of Soil Science at Coimbatore (Tamil Nadu).
- National Symposium on "Relevance of GM Technology to Indian Agriculture and Food Security" during 26-27 November, 2003 held at India Habitat Center, New Delhi organized by Gene Campaign, New Delhi.
- National Seminar on "Energy Challenges of 21st Century: Is Bio-Fuel a Solution?" held at Symposium Hall, National Agriculture Science Centre Complex, Dev Praksh Marg, Pusa Institute, New Delhi-110012 on 2nd September, 2003 organized by Panchtatva Garima Foundation, New Delhi.

PUBLICATONS

- Djiwanti, S.R., Wiratno, **Kaushik, S**. (**2023**). Burrowing Nematode in Spice and Fruit Crops and Their Management by Novel Biocontrol Strategies. In: Khan, M.R. (eds) Novel Biological and Biotechnological Applications in Plant Nematode Management. Springer, Singapore. https://doi.org/10.1007/978-981-99-2893-4_18
- **Kaushik, Suresh (2022).** Nanosensors Technology for Smart Intelligent Agriculture. (Pg. 267-300). *In* Adetunji C.O., Panpatte D.G., Jhalla Y.K. (Eds.). Agriculture Biotechnology: Food Security Hot Spots (1st Ed.). CRC Press. https://doi.org/10.1201/9781003268468
- **Kaushik, Suresh;** Soni, Vijay and Skotti, Efstanthia (Eds) (**2022**). Nanosensors for Futuristic Smart and Intelligent Healthcare Systems (1st Edition). CRC Press, Taylor & Francis. USA. https://doi.org/10.1201/9781003093534
- Kunwar S.S.S. and **Kaushik S**. (**2022**). Smart Nanosensors for Healthcare Monitoring and Disease Detection using AIoT Framework. (Pg 387-400). *In* Kaushik S., Soni V. and Skotti E. (Eds.). Nanosensors for Futuristic Smart and Intelligent Healthcare Systems. CRC Press, Taylor & Francis. USA. https://doi.org/10.1201/9781003093534
- **Kaushik Suresh**, Aishah Alatawi, Setyowati Retno Djiwanti, Amit Pandey, Efstathia Skotti, and Vijay Soni **(2021).** Potential of Extremophiles for Bioremediation. In: Deepak Panpatte and Yogeshwari Jhala (eds), Microbial Rejuvenation of Polluted Environment. Microorganisms for Sustainability, vol 25. Springer, Singapore. https://doi.org/10.1007/978-981-15-7447-4_12
- Pande A, **Kaushik S**, Pandey P, Negi A **(2020).** Isolation, characterization, and identification of phosphate-solubilizing *Burkholderia cepacia* from the sweet corn cv. Golden Bantam rhizosphere soil and effect on growth-promoting activities. Int J Veg Sci. 26(6): 591-607. https://doi.org/10.1080/19315260.2019.1692121
- Djiwanti SR, **Kaushik S (2019)** Nanopesticide: Future application of nanomaterials in plant protection. In Prasad R (eds) Plant Nanobionics. Nanotechnology in the Life Sciences. Springer, Cham. https://doi.org/10.1007/978-3-030-16379-2_10
- **Kaushik S**, Djiwanti SR, Skotti E **(2019)** Single-Particle Inductively Coupled Plasma Mass Spectrometry for Characterization of Engineered Nanoparticles. In: Prasad R. (eds) Microbial Nanobionics. Nanotechnology in the Life Sciences. Springer, Cham. https://doi.org/10.1007/978-3-030-16534-5_2
- **Kaushik S**, Setyowati SR **(2019)** Nanofertilizers: Smart Delivery of Plant Nutrients. In: Deepak Panpatte and Yogeshwari Jhala (eds) Nanotechnology for Agriculture: Crop Production & Protection. Springer, Singapore. https://doi.org/10.1007/978-981-32-9374-8_3
- Golui D, Datta SP and **Kaushik S (2018)** Interferences of medium and matrix in determination of trace toxic elements using inductively coupled plasma mass spectrometry (ICP-MS). Journal of

Environmental Biology; 39(1):103-108. http://doi.org/10.22438/jeb/39/1/MRN-652

- Yadav RK, Purkayastha TJ, Khan MA, and **Kaushik SC (2017)** Long-term impact of manuring and fertilization on enrichment, stability and quality of organic carbon in Inceptisol under two potato-based cropping systems. Science of the Total Environment; 609:1535-1543 https://www.altmetric.com/details/23749131 and https://doi.org/10.1016/j.scitotenv.2017.07.128
- **Kaushik S** and Djiwanti SR, **(2017)** Nanotechnology for Enhancing Crop Productivity; In: Ram Prasad, Vivek Kumar, and Manoj Kumar (Eds.); Nanotechnology: Agricultural paradigm; Springer, Singapore. https://doi.org/10.1007/978-981-10-4573-8_11
- **Kaushik S** and Djiwanti SR, **(2017)** Genetic Improvement of Traits for enhancing NPK Acquisition and Utilization Efficiency in Plants In: Hossain MA et al. (Eds.), Plant macro-nutrient use efficiency: molecular and genomic perspectives, Elsevier. https://doi.org/10.1016/b978-0-12-811308-0.00015-6
- Pandey A, Pandey P, Mehra S, Singh M, and **Kaushik S (2017)** Phenotypic and Genotypic Characterization of Phosphate Solubilizing Bacteria and their Efficiency on the Growth of Maize (*Zea mays*), IJAIR, 5: 929-938. http://dx.doi.org/10.1016/j.jgeb.2017.06.005
- Pande Amit, Pandey Prasant, **Kaushik Suresh (2017)** Co-inoculation of *Burkholderiacepacia* and *Alcaligenes aquatilis* enhances plant growth of maize (*Zea mays*) under green house and field condition. Korean Journal of Agricultural Science 44:196-210. https://doi.org/10.7744/kjoas.20170019
- Amit Pande, Pranav Dorwal and **Suresh Kaushik (2017)** An Eco-Friendly Approach for Managing Phosphorus Deficiency in Agricultural Soils: By Using Phosphate Solubilizing Microbe, International Journal of Current Research. 9:51713-51723. http://www.journalcra.com/sites/default/files/issue-pdf/23312.pdf
- Bajpai MS, Gupta N, **Kaushik S**, Sinha VB and Majumdar RS **(2017)** Response of *Ocimum sanctum* L. to varying mercuric chloride stress; Physiol Mol Bio Plants
- Mahwar H, Prasanna R Kaur S, Thapa S, Kanchan A, Singh R. , **Kaushik SC**, Singh, and Nain L. **(2017).** Deciphering the mode of interactions of nanoparticles with mung bean (*Vigna radiata* L.); Israel journal of plant sciences, 2017. https://doi.org/10.1080/07929978.2017.1288516
- Singh A, Sharma VK, Dikshit HK D Singh, M Aski, Prapti Prakash, **Kaushik SC**, Gyanendra Singh, Shiv Kumar, A Sarker (2017) Microsatellite marker-based genetic diversity analysis of elite lentil lines differing in grain iron and zinc concentration, J. Plant Biochem. Biotechnol. 26 (2): pp 199-207. https://doi.org/10.1007/s13562-016-0382-6
- Djiwanti SR, Supriadi, Wayhudi A, Wahuno D, Nurhayati H, Bagyataj DJ, **Kaushik S** (Eds) **(2016).** Innovation on Biotic and Abiotic Stress Management to maintain Productivity of Spice Crops in Indonesia, IAARD Press, Jakarta, Indonesia
- **Kaushik SC (2016)** Nanotechnology: Application in Agriculture to increase Crop Productivity. In: Djiwanti SR, Supriadi, Wayhudi A, Wahuno D, Nurhayati H, Bagyataj DJ, **Kaushik SC** (Eds); Innovation on Biotic and Abiotic Stress Management to maintain Productivity of Spice Crops in Indonesia, IAARD Press, Jakarta, Indonesia. pp 185-197.
- **Kaushik SC (2015)** Nanotechnology: Application in Agriculture to increase Crop Productivity in International Workshop on "Innovation of Environmental Stress Management for Spice Crops" held at Indonesian Spices and Medicinal Crops Research Institute (ISMECRI)/BALITTRO, Bogor, Indonesia during August 25-27, 2015; Guide Book, pp.08
- Sharma VK, Singhal SK, Uaduvanshi NPS and **Kaushik SC (2014);** Adhhik Upaj, Labhh evam Mrida Swasthya hetu Santulit Uravarak Prayog (in Hindi); *Prasar Doot*, August 2014, pp. 9-11.
- Patra AK and **Kaushik SC (2013**); Effect of Arsenic on Soil Enzyme Activities in National Seminar on Developments in Soil Sciences and 78th Annual Convention of Indian Society of Soil Sciences at CAZRI, Jodhpur during October 23-26, 2013.
- Patra AK, Purakayastha TJ, **Kaushik SC,** Sharma AR, Behera UK **(2011)**; Conservation Tillage, Residues Management and Cropping Systems effects on Carbon Sequestration and Soil Biodiversity in Semi-Arid Environment of India, Proceedings of the 5th World Congress of Conservation Agriculture incorporating 3rd Farming Systems Design Conference on Resilient Food Systems for a Changing World, 26-29th September, 2011, Brisbane, Australia.

- Patra AK, Purakayastha T.J., **Kaushik SC**, Yaduvanshi N.P.S. and Anand Swarup **(2011**) Effect of Long-term Fertilization with and without FYM or Green Manures on Soil Ecology in a Reclaimed Sodic Soil in National Seminar on Developments in Soil Sciences and 76th Annual Convention of Indian Society of Soil Sciences at Dharwad during November 16-19, 2011.
- Patra AK, Purakayastha TJ, **Kaushik SC,** Sharma AR, Behera UK and Verma V **(2009)** Effect of Conservation Tillage and Residues Management on Carbon Sequestration and Microbial Diversity in Maize-based Cropping Systems Diversity in National Seminar on Developments in Soil Sciences and 74th Annual Convention of Indian Society of Soil Sciences at New Delhi during December 22-25, 2009. Abstracts, pp. 116
- Patra AK and **Kaushik SC (2008)**. Recent Biotechnological Approaches for Exploring Soil Biodiversity. In: NP Singh and PK Chhonkar (eds.) Biodiversity for Sustainable Development. Samskriti and ASEED, New Delhi India., pp. 147-159
- Patra AK, **Kaushik SC**, Purakayastha TJ and Verma Vijay **(2008)** Impact of Long-term Land Use and Crop Management on Nitrogen Cycling and Microbial Diversity in National Seminar on Developments in Soil Sciences and 73rd Annual Convention of Indian Society of Soil Sciences at Bangalore (Karnataka) during November 27-30, 2008
- **Kaushik SC** and Patra AK **(2006)** Probing of Soil Microbial Diversity through Molecular Tools in National Seminar on Developments in Soil Sciences and 71st Annual Convention of Indian Society of Soil Sciences at Bhubaneswar (Orissa) during November 10-13, 2006
- Patra AK, TJ Purakayastha, **SC Kaushik** and V Verma **(2006)** Impact of long-term land use and crop management on nitrogen dynamics and microbial groups in National Seminar on Developments in Soil Sciences and 71st Annual Convention of Indian Society of Soil Sciences at Bhubaneswar (Orissa) during November 10-13, 2006
- Patra AK, **Kaushik SC**, Purakayastha TJ, Saxena AK and Verma Vijay **(2005)** Unraveling the impact of long-term fertilizer application on microbial activity, density and diversity in a semi-arid agro-ecosystems presented in National Seminar on Developments in Soil Science and 70th Annual Convention of Indian Society of Soil Science at Coimbatore (Tamil Nadu) during September 28-October 01,2005, Abstracts, pp.54
- Singh YV, Singh BV, Dhar DW and **Kaushik SC (2004)** Effect of integrated plant nutrient supply system on grain yield, grain quality and soil microbial population in rice-wheat cropping system by, presented in National Symposium on Recent Advances in Rice-based Farming Systems at Cuttack (Orissa) during 17-19 November, Abstracts, pp. 45
- **Kaushik SC** and Rattan RK **(2003)** Enhancing Acquisition Efficiency of Micronutrients by Plants Through Biotechnological Techniques; Indian Fertilizer Scene Annual, **19**:54-63
- **Kaushik SC** and Kumar PA **(2003)** Field Performance of Transgenic Brinjal *(Solanum melongena* L.) Plants Expressing Insecticidal Proteins derived from *Bacillus thuringiensis*, presented in 2nd International Congress of Plant Physiology on Sustainable Plant Productivity under Changing Environment held at New Delhi, India, during 8-12 January; Book of Abstracts, pp.470

Websites

- https://www.linkedin.com/in/sckaushik/
- https://www.researchgate.net/profile/Suresh_Kaushik
- https://www.mendeley.com/profiles/suresh-kaushik2/
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- https://loop.frontiersin.org/people/1053343/bio
- http://aidasco.org/suresh-kaushik/
- https://www.biotecharticles.com/Authors/0/Suresh-Kaushik-674.html
- https://gingerfingers.wordpress.com/tag/suresh-kaushik/
- https://sites.google.com/view/dr-suresh-kaushik/home
- https://twitter.com/DrKaushikSuresh
- https://www.scopus.com/authid/detail.uri?authorId=57194719621
- Kaushik, Suresh Chand - Author details - Scopus Preview