CURRICULUM VITAE

Dr. Arun Kumar
Scientist E,
Fermentation and Phytofarming Division, Block-F
CSIR- Institute of Himalayan Bioresource Technology, Palampur, H.P. India
Email IDs: arunkumar@ihbt.res.in, arunihbt@gmail.com
Contact no.: +91 (941) 8830880
FAX: +91- 1894 -230433

Areas of Interest

Enzymology, Enzyme & Metabolic engineering, Functional genomics

https://scholar.google.co.in/citations?user=EQc3kPIAAAAJ&hl=en&authuser=1

Employment

[2025- onwards]	**Scientist E-Enzymology (Pay level-13)** CSIR-Institute of Himalayan Bioresource Technology, Palampur, H.P. India
[2020- 2025]	**Senior Scientist/Scientist D-Enzymology (Pay level-12)** CSIR-Institute of Himalayan Bioresource Technology, Palampur, H.P. India
[2017- 2020]	**Ramanujan Fellow** School of Agricultural Biotechnology, PAU, Ludhiana, India
[2015 –2017]	**Postdoctoral Research Associate** Department of Horticulture, University of Wisconsin, Madison, USA
[2013 –2015]	**Postdoctoral Fellow** Department of Plant Science, McGill University, Montreal, Canada

Education

[2007 – 2013]	**Ph.D. Biotechnology** from the Department of Biotechnology, Panjab University, Chandigarh /CSIR- Institute of Himalayan Bioresource Technology, Palampur, India.
[2002-2004]	**M.Sc. Biotechnology** with 9.36 CGPA (84.24%) from Thapar University, Patiala, Punjab, India
[1998-2002]	**B.Sc.** (Botany, Chemistry, and Zoology) with 7.42 OGPA (74.2%) from College of Basic Sciences, CSKHPKVV, Palampur, H.P. India

Academic Activities

Sem II 2017-18	Biotech 103 (2+1): Introduction to Biotechnology Biotech 305 (2+0): Introduction to Molecular Biology Biotech 499 (0+20): In House Project

Sem I 2018-19	Biotech 305 (2+0): IPR, Biosafety, and Bioethics
Sem II 2018-19	Biotech 604 (2+0): Advances in Functional Genomics and Proteomics Biotech 212 (3+0): Epigenetics and Gene Regulation
Sem I 2019-20	Biotech 305 (2+0): IPR, Biosafety and Bioethics
Sem-II 2019-20	Biotech 212 (3+0): Epigenetics and Gene Regulation
Sem I-II 2019-20	Biotech 499 (0+20): In House Project

Membership of Professional Societies

1. Life Member of the Society of Biological Chemists, IISc Bangalore, India (Membership No. 4895).
2. Life Member of the Indian Society of Chemists and Biologists, Lucknow, India (Membership No. LF 1334/2024
3. Life Member of the "Indian Society of Plant Physiology (ISPP)" (Membership No. LM-1165).
4. Life Member of the "Society for Plant Biochemistry and Biotechnology (SPBB)" [Membership No. 1-908(2021)].
5. Life member of the prestigious "Chemical Biology Society, Kolkatta (Membership No. LM-85).

Editorial Roles

1. Serving as **Review Editor** on the Editorial Board of Computational Genomics (specialty section of Frontiers in Genetics, Frontiers in Bioengineering and Biotechnology and Frontiers in Plant Science).

Approved/ongoing/completed research project

Sr. No.	Current project title	Funding agency and sanction no.	Amount (in Lakhs)	Date of start of the project	Date of completion
1.	Investigating the thermosensing mechanism of *Camellia sinensis* mitochondrial superoxide dismutase underlining its activation and stability at temperature extremes **(PI: Ongoing)**	DBT, GOI (GAP-0351)	75.42 lakhs	23rd April 2025	22nd April 2028
2.	Fermentation Scale up and Technology Development of Lead Industrial Enzymes for Biofuel, Food, Feed, Agriculture and Vaccine Applications Optimization and pilot-scale production of lytic polysaccharide monooxygenase(s) for application in	CSIR, GOI (MMP025201)	619.5076 (64.0376 for IHBT)	8th April, 2024	31st March 2026

	biomass deconstruction **(PI: Ongoing)**				
3.	Characterization of Mannanase enzyme (ThMan) from *Trichoderma harzianum* for applications in Biomass Deconstruction **(PI: Ongoing)**	CSIR,GOI (CSPS24/RDSF/IHBT/IHP24/03)	19.11	3rd April, 2024	31st March 2026
4.	Deciphering the stress-induced and chloroplast-triggered programmed cell death in *Arabidopsis thaliana* **(Co-PI: Approved**).	DBT, GOI	77.04520	2024	2027
5.	Process optimization and up-scale production of lignocellulosic extremozymes from Himalayan microbes for biomass valorization/depolymerization **(Co-PI: Ongoing)**	DBT, GOI (No. BT/PR45190/NER/95/1902/2022)	426.69	21st March 2022	30th March 2025
6.	Cisgenetic engineering of rice (*Oryza sativa*) susceptible elite cultivars for enhanced disease resistance using genome editing CRISPR/Cas9 technology. **(PI: Completed)**	SERB, GOI (File no. SB/S2/RJN-022/2017)	107.33	23rd Oct 2017	22nd Oct 2022
7.	Bioprospecting kinetically stable lytic polysaccharide monooxygenase(s) (LPMOs) for accelerated degradation of lignocellulosic biomass. **(PI: Completed)**	CSIR, GOI (File no. 6/1/FIRST/2020-RPPBDD-TMD-SeMI)	95.58	16th July 2021	31st March 2023
8.	Evaluation of thermostable variants of copper, zinc superoxide dismutase in combating oxidative stress in *Arabidopsis thaliana* **(PI: Completed)**	SERB, GOI (File No. SRG/2021/000933)	30.39	30th Dec 2021	29th Dec 2023
9.	Characterization and purification of reverse transcriptase (RNA dependent DNA polymerase) activity from greenhouse whitefly *Trialeurodes vaporariorum.* **(Co-PI: Completed)**	CSIR, GOI (File no. 31-2(293)/2022-23)	90.08	16th July 2021	31st March 2023
10.	Molecular cloning and characterization of *Xa38* loci conferring resistance to bacterial blight (BB) disease in rice and identification of novel and superior alleles. **(PI: handed over to Co-PI)**	DBT, GOI (File No. BT/PR30636/AGIII/103/1096/2018)	87.1432	5th Aug. 2019	4th Aug. 2022

Peer-Reviewed Research Publications

1. Dhiman, A., Singh, R., **Kumar, A.*,** Purohit, R*. (2026). Structure-guided engineering of serratiopeptidase using constant-pH molecular dynamics and site-directed mutagenesis to improve pH-dependent functional resilience. **BBA - Proteins and Proteomics; 1874:**141151; https://doi.org/10.1016/j.bbapap.2026.141151.
2. Chauhan, M., Himanshu, Sharma, V.K., **Kumar, A.*** (2026). Biochemical and biophysical characterization of a cold-active yet highly thermostable manganese superoxide dismutase (CsMnSOD) from *Camellia sinensis*. **Archives of Biochemistry and Biophysics, 782:** 110880; https://doi.org/10.1016/j.abb.2026.110880.
3. Godara, R., Mohapatra, S., Thakur, S., Roy, A, Vaishnavi, S., Anmol, Sharma, U., Hallan, V., **Kumar, A.,** Dogra, V. (2026). Membrane lipid-derived heptanedioic acid primes defence and systemic growth in plants. **Plant Physiology, 201:** kiag425**.**
4. Kumar, A., Sharma, T., Kumari, N., Kumar, R., Acharya, V., **Kumar, A*.** (2026). Unveiling the carbohydrate-active enzyme repertoire of *Trichoderma caribbaeum* IHBT through whole-genome analysis and transcriptional profiling. **Archives of Microbiology**, **208**, 373 (2026); **DOI:** 10.1007/s00203-026-04924-4. ***Corresponding author**
5. Kumar, V., Prasad, A., Goel, A., Sharma, V.K., Lore, J.S., **Kumar, A.* (**2026). Host-induced silencing of *Rhizoctonia solani* 5-enolpyruvylshikimate-3-phosphate synthase impairs its virulence in rice. **Plant Biotechnology Journal, 24:**3573–3593*;* https://doi.org/10.1111/pbi.70582 ***Corresponding author**
6. Kumari, N., Jassal, S., Kumar, A., & **Kumar, A.*** (2025). Oligosaccharides: a comprehensive review of various types, biological activities and emerging health benefits. **Archives of Microbiology,** 207(10), 242. ***Corresponding author**
7. Bhardwaj, P., Jain, R., Rawat, N., Joshi, R., **Kumar, A.,** Pandey, S. S., & Kumar, S. (2025). *Naganishia liquefaciens* ARY7, a psychrophilic yeast endophyte improves plant low temperature acclimation through auxin and salicylic acid signaling. **Physiologia Plantarum**, 177(3), e70267.
8. Singh, R., Anurag, Chauhan, M., **Kumar, A.***, Purohit, R.***** (2025). Integrated Computational and Experimental Approaches to Identify New Papain-Like Protease Inhibitors. **Journal of Molecular Structure**, 1322: 140460 ***Co-Corresponding author**
9. Sharma, T., Kawoosa, T., Suri, A., **Kumar, A.** (2024). A bZIP type transcription factor from Picrorhiza kurrooa modulates the expression of terpenoid biosynthesis genes in *Nicotiana benthamiana*. **South African Journal of Botany,** 169: 210-218.
10. Kumar, A., Singh, A., Sharma, V.K., Goel, A., **Kumar, A.*** 2024. The Upsurge of Lytic Polysaccharide Monooxygenases in Biomass Deconstruction: Characteristic Functions and Sustainable Applications. **The FEBS Journal, 291:** 5081–5101; DOI: 10.1111/FEBS.17063. ***Corresponding author**
11. Kumar, V., Chaudhary, P., Prasad, A., Dogra, V., **Kumar, A.*** 2023. Jasmonic acid limits *Rhizoctonia solani* AG1-IA infection in rice by modulating reactive oxygen species homeostasis. **Plant Physiology and Biochemistry, 196:** 520-530, https://doi.org/10.1016/j.plaphy.2023.02.009 ***Corresponding author**

12. A Zadokar, P Kumar, A Kumar, R Sharma (2023). Insight into the molecular breeding research status for crop improvement in India: prospects and achievements. **Plant Molecular Biology Reporter 41:** 537-558.

13. Chauhan, M., Bhardwaj, V.K., Kumar, A., Kumar, V., Kumar, P., Enayathullah, M.G., Thomas, J., George, J., Bokara, K.K., Purohit, R., **Kumar, A.*,** Kumar, S. 2022. Theaflavin-3-gallate inhibits the main protease (M^{pro}) and reduces SARS-CoV-2 count *in vitro*. **Scientific Reports, 12:** 13146; **DOI:** 10.1038/s41598-022-17558-5). ***Corresponding author**

14. Kashyap, P., Chauhan, M., Chauhan, V., Purohit, R., **Kumar, A*.,** Kumar, S. (2022). A ricin-based peptide BRIP from *Hordeum vulgare* inhibits main protease (M^{pro}) of SARS-CoV-2. **Scientific Reports, 12:** 12802; **DOI:** 10.1038/s41598-022-15977. ***Corresponding author**

15. Kaur, R., Kumar, P., **Kumar, A.*,** Prabha, U.P., Singh, R., Kaur, G., Lore, J.S., Neelam, K., Vikal, Y.* (2022). *OsMATE6* gene putatively involved in host defense response toward susceptibility against *Rhizoctonia solani* in rice. **Journal of Plant Interactions, 17:** 744-755. ***Corresponding author**

16. Neemisha, **Kumar, A.** Sharma, P., Kaur, A., Sharma, S., Jain, R. (2022). Harnessing rhizobacteria to fulfil inter-linked nutrient dependency on soil and alleviate stresses in plants. **Journal of Applied Microbiology, 133:** 2694–2716.

17. Hussain, R., Huali, X., **Kumar, A.,** Al-Weshahy, A. (2022). Discoloration of Raw and Cooked Potatoes: Fundamentals of Nature, Mechanisms, Causes, Measurement, and Control. **American Journal of Potato Research, 99**: 287–306.

18. Kumar, S., Bhardwaj, V.K., Kaachra, A., Guleria, S., **Kumar, A.,** Purohit, R., Kumar, S. (2021). Site-directed mutagenesis (P61G) of copper, zinc superoxide dismutase enhances its kinetic properties and tolerance to inactivation by H_2O_2. **Plant Physiology and Biochemistry, 168**: 221-229.

19. Sharma, M., Irfan, M., **Kumar, A.,** Kumar, P., Datta, A. (2021). Recent insights into plant circadian clock response against abiotic stress. **Journal of Plant Growth Regulation, 41**: 3530–3543.

20. Kapoor, B., Kumar, P., Sharma, R., **Kumar, A.** (2021). Regulatory interactions in phytohormone stress signaling implying plants resistance and resilience mechanisms. **Journal of Plant Biochemistry and Biotechnology, 30**: 813–828.

21. Kapoor, B., **Kumar, A.,** Kumar, P. (2021). Transcriptome repository of North-Western Himalayan endangered medicinal herbs: A paramount approach illuminating molecular perspective of phytoactive molecules and secondary metabolism. **Molecular Genetics and Genomics, 296:**1177-1202.

22. Plant Cell Atlas Consortia, Jha et al. (2021) Vision, challenges and opportunities for a Plant Cell Atlas. **eLife**;10:e66877. DOI: https://doi.org/10.7554/eLife.66877. **Consortia author**

23. **Kumar, A***., Guleria, S., Dogra, V., Kumar S. (2021). How plants manage Reactive oxygen species – Some learnings from extremophytes. **Environmental and Experimental Botany, 189:** 104525 ***Corresponding author**

24. Kumar, G., Kumar, P., Kapoor, R., Lore, J.S., Bhatia, D., **Kumar, A*.** (2021). Characterization of an evolutionarily distinct rice *BAHD-Acyltransferase* gene family provides insights into its plausible role in rice susceptibility to *Rhizoctonia solani* AG1-IA. **The Plant Genome,** e20140.DOI: 10.1002/tpg2.20140. ***Corresponding author**

25. Kumar P., Kumar P., Sharma, D., Verma, S.K., Halterman, D., **Kumar, A.*** (2021). Genome-wide identification and expression profiling of basic Leucine Zipper transcription factors following abiotic stresses in potato (*Solanum tuberosum* L.). **PLoS One** *16*(3), e0247864. ***Corresponding author**

26. Munaiz, E.D., Martinez, S., **Kumar, A.,** Caicedo, M., Ordas, B. (2020). The Senescence (Stay-Green): an Important Trait to Exploit Crop Residuals for Bioenergy. **Energies, 13:** 790.

27. Baghel, M., Nagraja, A., Srivastav, M., Meena, N.K., Kumar, M.S, **Kumar, A.,** Sharma, R.R. (2019). Pleiotropic influences of brassinosteroids on fruit crops- a review. **Journal of Plant Growth Regulation, 87**: 375–388.

28. Karre, S., **Kumar, A.**, Yogendra, K.N., Kage, U., Kushalappa, A.C., Charron, JB. (2019). *HvWRKY23* regulates flavonoid glycoside and hydroxycinnamic acid amide biosynthetic genes in barley to combat Fusarium head blight. **Plant Molecular Biology, 100**: 591–605.

29. **Kumar, A.,** Jansky, S., Halterman, D. (2017). Potato stem cuttings to study *Verticillium dahliae* infection for resistance breeding and -omics studies. **American Journal of Potato Research, 94:** 270-274.

30. **Kumar, A.**, Mosa, K., Ji, L., Kage, U., Madalageri, D., Dhokane, D., Rana, N.P. (2017). Metabolomics assisted biotechnological interventions for developing plant-based functional foods and nutraceuticals. **Critical Reviews in Food Science and Nutrition,** 58(11):1791-1807. ***Corresponding author**.

31. Karre, S., **Kumar, A.,** Dhokane, D., Kushalappa, A.C. (2016). Metabolo-transcriptome profiling of barley reveals induction of a novel chitin elicitor receptor kinase gene (*HvCERK1*) conferring resistance against *Fusarium graminearum*. **Plant Molecular Biology, 93:** 247-267.

32. **Kumar, A.,** Sharma, M., Bhardwaj, P.K., Singh, D., Kumar, S. (2016). Copper, zinc superoxide dismutase from *Caragana jubata:* a thermostable enzyme that functions under a broad pH and temperature window. **Process Biochemistry, 51**: 1434-1444.

33. **Kumar, A.,** Yogendra, K.N., Karre, S., Kushalappa, A.C., Dion, Y., Choo, T.M. (2016). WAX INDUCER1 (HvWIN1) transcription factor regulates free fatty acid biosynthetic genes to reinforce cuticle to resist Fusarium head blight in barley spikelets. **Journal of Experimental Botany, 67**: 4127-39.

34. Yogendra, K.N., **Kumar, A.,** Sarkar, K., Li, Y., Pushpa, D., Mosa, K., Duggavathi, R., Kushalappa, A.C. (2015). Transcription factor *StWRKY1* regulates phenylpropanoid metabolites in potato to resist late blight. **Journal of Experimental Botany, 66:** 7377-7389.

35. **Kumar, A.**, Karre, S., Dhokane, D., Kage, U., Hukkeri, S., Kushalappa, A.C. (2015). Real-time quantitative PCR based method for the quantification of fungal biomass to discriminate quantitative resistance in barley and wheat to fusarium head blight. **Journal of Cereal Science, 64:** 16-22.

36. Kage, U., **Kumar, A.**, Dhokane, D., Karre, S., Kushalappa, A.C. (2015). Functional molecular markers in crop improvement. **Critical Reviews in Biotechnology, 36**: 917-930.

37. **Kumar, A**., Randhawa, V., Acharya, V., Singh, K., and Kumar, S. (2015). Amino acids flanking the central core of Cu,Zn superoxide dismutase are important in imparting activity after autoclaving. **Journal of Biomolecular Structure & Dynamics, 34**: 475-485.

38. **Kumar, A**., Kaachra, A., Bhardwaj, S., Kumar, S. (2014). Copper, zinc superoxide dismutase of *Curcuma aromatica* is a kinetically stable protein. **Process Biochemistry, 49:** 1288-1296.

39. **Kumar, A***., Kage, U., Mosa, K., Dhokane, D. (2014). Metabolomics: a novel tool to bridge phenome to genome under changing climate to ensure food security. **Medicinal and Aromatic Plants, 3:** e154. DOI: 10.4172/2167-0412.1000e154. (**Editorial; *Corresponding author).**

40. **Kumar, A**., Dutt. S., Bagler, G., Ahuja, P.S., and Kumar, S. (2012). Engineering a thermo-stable superoxide dismutase functional at sub-zero to >50 °C, which also tolerates autoclaving. **Scientific Reports**, **2:** 387; DOI, 10.1038/srep00387.

41. Bafana, A., Dutt. S., **Kumar, A**., Kumar, S., and Ahuja, P.S. (2011). The basic and applied aspects of superoxide dismutase. **Journal of Molecular Catalysis B: Enzymatic**, **68**: 129-138.

42. Ghawana, S., Paul, A., Kumar, H., **Kumar, A.**, Singh, H.**,** Bhardwaj, P.K., Rani, A., Singh, K., Raizada, J., Singh, R.S., Ahuja, P.S., and Kumar, S. (2011). An RNA isolation system free of Guanidinium salts for isolation of RNA from plant tissues rich in secondary metabolites. **BMC Research Notes, 4**:85.

43. Ghosh, M, **Rana, A.K.,** Bansal, S, and Ganguli, A. (2005). Predictive Microbiology: An Emerging Tool for Assessing Food Safety and Quality. **Bioinformatics India, 3:** 95-99.

44. Ganguli, A., Bansal, S., Malik, N., **Rana, A. K.,** and Ghosh, M. (2004). Microbiological Quality and Safety of Two Popularly Consumed Raw, Street Vended Foods in India. **Food Science and Biotechnology, 13**: 417-420.

Book Chapters

1. Kumar, V., Prasad, A., Kashyap, P., Joshi, R., **Kumar, A*.** 2024. Integrated omics approaches for plant disease resistance. In: Biotechnological advances for disease tolerance in plants, pp 211-237. Eds Singh et al., Springer Nature, Singapore. DOI: 10.1007/978-981-99-8874-7_9.
2. Kumar, P., Dhiman, K., Shaunak, I., Gambhir, G., **Kumar, A.**, Srivastva, D.K. Nanotechnology applications in agriculture, pp 75-98. In: Nanotechnology Horizons in Food Process Engineering, **Eds** Goyal et al. (2023): 75.
3. Sood, S., **Kumar, A.** Bhardwaj, V. (2022). Genome Editing Prospects to Develop Disease/Pest Resistant Potato Varieties. In: Sustainable Management of Potato Pests and Diseases, pp 413-434. Eds Chakrabarti et al. Springer Nature, Singapore. https://doi.org/10.1007/978-981-16-7695-6_17.
4. Singh, R., Joshi, R., Munaiz, E., Kumar, S., **Kumar, A*.** (2021). Application of metabolomics to food systems. In: Foodomics: Omic Strategies and Applications in Food Science. Chapter 17, pp 416-442. Ed. J. Barros-Velazquez, Royal Society of Chemistry, London, UK. https://doi.org/10.1039/9781839163005-00416 **(Invited Chapter).**
5. Kumar P., **Kumar A.,** Dhiman K., Srivastava D.K. (2021) Recent Progress in Cereals Biofortification to Alleviate Malnutrition in India: An Overview. In: Kumar Srivastava D., Kumar Thakur A., Kumar P. (eds) Agricultural Biotechnology: Latest Research and Trends. pp 253-280; Springer, Singapore. https://doi.org/10.1007/978-981-16-2339-4_11.

Patents

1. **Kumar, A.,** Kumar, A., Srivas, P., Singh, D., Anmol, Sharma, U. A process for production of recombinant novel lytic polysaccharide monooxygenase (LPMO) and its applications thereof. **Filed in India** and PCT countries (0058NF2026; dated 02.3.2026).
2. **Kumar, A.**, Dutt, S., Ahuja, P.S., and Kumar, S. An autoclave stable recombinant Cu/Zn superoxide dismutase with enhanced thermoflexibility. **Indian Patent No.** 362282 (Awarded on 21.03.2021).
3. Bhardwaj, P.K., **Kumar, A**., Kishore, A., Ghawana, S., Rani, A., Singh, K., Singh, H., Singh, R.S., Kumar, H., Sood, P., Dutt, S., Kumar, S., and Ahuja, P.S. Method of cloning stable stress tolerant superoxide dismutase using degenerate primers. **US Patent No.** US 9212350 B2 (2015/12/15). **(Granted)**.
4. Bhardwaj, P.K., **Kumar, A**., Kishore, A., Ghawana, S., Rani, A., Singh, K., Singh, H., Singh, R.S., Kumar, H., Sood, P., Dutt, S., Kumar, S., and Ahuja, P.S. Method of cloning stable stress tolerant superoxide dismutase using degenerate primers. **European patent** publication no. EP2268661 (Other details: Application no. **EP20090727645**; **PCT no. A2909727645.5**; publication date: January 5, 2011).

Technology Transfer

An engineered variant of Cu, Zn SOD with a very unique property of autoclave-stability was developed, patented and **the technology for production of enzyme was licensed to M/s PHYTO BIOTECH^{TM}, Kolkata**; http://www.phytobiotech.in/superoxide-dismutase.html) (MoU signed on 28th Feb 2014).

Presentations/participations (national and international)

1. Kumar, V., Prasad, A., Goel, A., **Kumar, A*.** 2024. Decoding the virulence strategies of *Rhizoctonia solani* AG1-IA to develop sheath blight resistance in rice" at National Symposium of Himalayan Phytopathological Society" held from 7th - 8th November 2024, at CSKHPKV, Palampur.
2. Kumar, V., Prasad, A., Goel, A., **Kumar, A*.** 2024. Understanding the molecular intricacies of Rice-*R. solani* AG1-IA interactions to develop sheath blight resistance in rice" at a national conference on "Genomic Revolution to Foster Advances and Innovations in Crop Improvement" held from 27th - 29th February 2024, at Punjab Agricultural University, Ludhiana.
3. Kumar, V., Prasad, P., Goel, A., **Kumar, A*.** 2023. Decoding the virulence spectrum of *Rhizoctonia solani* AG1-IA to engineer rice for enhanced tolerance to sheath blight. From October 30th to November 1st, 2023 at the International Conference on Biochemical and Biotechnological Approaches for Crop Improvement (IBBACI 2023), held at the NASC Complex, New Delhi.
4. Prasad, A., Saroch, R., Kumar, V., Acharya, V., **Kumar, A*.** 2023. Exploring the role of CircRNA in regulating tolerance/susceptibility in rice against *Rhizoctonia solani* AG1-IA. From January 06-09, 2023 at International Conference on Food and Nutritional Security 2023 (iFANS-2023).
5. Chauhan, M., Kumar, V., Kumar, V., Kumar, S., **Kumar, A***. 2023. Evaluation of thermostable variant of copper, zinc superoxide dismutase in combating oxidative stress in

Arabidopsis thaliana. From January 06-09, 2023 at International Conference on Food and Nutritional Security 2023 (iFANS-2023).

6. Kumar, V., Prasad, A., Chaudhary, P., **Kumar, A*.** 2023. Understanding molecular intricacies of rice-*R. solani* AG1-IA interaction to develop sheath blight resistance in rice. From January 06-09, 2023 at International Conference on Food and Nutritional Security 2023 (iFANS-2023).
7. **Kumar, A*.,** Kumar, P. Chaudhary, P. 2021. Transcriptome landscaping for understanding the molecular mechanisms of tolerance/susceptibility during rice-*Rhizoctonia solani* AG1-IA interaction. From: April 08-10, 2021 at 42nd Annual Meeting of PTCA(I) & International Symposium on APBGE-2021 (**Oral talk).**
8. Served as a **Panel member** for an international webinar on "Genomic Selection in Crop Plants" organized by Plantgenomia on 24th October 2020.
9. Served as a **Panel member** of "Dr. Gurdev Singh Khush Webinar on Rice Genomics" on August 22, 2020. This webinar was organized by the Department of Biotechnology, PU, Chandigarh, to celebrate the birthday of renowned Scientist Dr. Gurdev Singh Khush.
10. Participated in "3rd ARRW International Symposium on Frontiers of Rice Research for Improving Productivity, Profitability and Climate Resilience" held at ICAR-National Rice Research Institute, Cuttack, Odhisha, India from 6th -9th February 2018. **(Participation)**.
11. Participated in "Har Gobind Khorana Memorial Symposium on Genes, Genomes & Membrane Biology" held at NABI-Mohali, India from 03-05 December 2017. **(Participation)**.
12. **Kumar, A.** Understanding the molecular determinants of resistance to *Verticillium dahliae*: from trials and tribulations to successes and prospects. A special seminar at the Department of Horticulture, UW-Madison, WI, USA. **(Oral talk).**
13. **Kumar, A.,** Jansky, S., Endelman, J., Halterman, D. QTL mapping and candidate gene discovery in potato for resistance to the Verticillium wilt pathogen *Verticillium dahliae.* From: August 05-09, 2017 at San Antonio, Texas, USA. **(Poster presentation)**.
14. **Kumar, A.,** Jansky, S., Endelman, J., Halterman, D. Molecular Determinants of Resistance to *Verticillium dahliae*. From 23-27, July 2017 at Fargo, North Dakota, USA. **(Oral talk).**
15. **Kumar, A.,** Jansky, S., Halterman, D. Identification of genetic determinants of Verticillium wilt resistance in potato. From: January 13-19, 2017 at Plant & Animal Genomics XXIV-2016, San Diego, USA. **(Poster presentation)**.
16. Ames, M., Rouse, D., **Kumar, A.,** and Jansky, S. Data integration and knowledge management to facilitate research on plant-pathogen interactions: case study *Solanum tuberosum* – Verticillium wilt. From: January 13-19, 2017 at Plant & Animal Genomics XXIV-2016, San Diego, USA. **(Poster presentation).**
17. **Kumar, A.** Verticillium wilt studies in potato: genotyping and phenotyping. NCCC215-2016 Potato Breeding and Genetics Technical Committee Meeting at Holiday Inn Express at O'Hare, Chicago, Illinois from December 5-6, 2016. **(Oral talk)**.
18. Karre, S., Dhokane, D., **Kumar, A.,** Kushalappa, A.C. Barley chitin elicitor receptor kinase (HvCERK1) confers resistance against *Fusarium graminearum*: 8th Canadian Workshop on Fusarium Head Blight, At Hotel Delta Ottawa, Canada from Nov. 20-22, 2016.
19. **Kumar, A.,** Halterman, D., Rouse, D., Jansky, S. Evaluation of resistance in potato genotypes

against race 1 and race 2 strains of *Verticillium dahlia.* From: July 31–August 4th, 2016 at 100th Annual Meeting of The Potato Association of America at Grand Rapids, Michigan, USA **(Oral talk).**

20. **Kumar, A.,** Halterman, D., Rouse, D., Jansky, S. Segregation of unknown signaling components in potato complicates marker-assisted selection for *Ve*-mediated Verticillium resistance. From: July 17–21, 2016 at IS-MPMI XVII Congress, Portland, Oregon, USA. (**Poster presentation)**.
21. **Kumar, A.** A unified forward and reverse genetics approach to dissect potato-disease resistance mechanisms against *Verticillium dahliae.* Oral presentation at ABCDS seminar series organized by USDA vegetable crop research unit at Department of Horticulture, UW, Madison, USA on 30th March 2016 http://vcru.wisc.edu/simonlab/abcds/index.html **(Oral talk)**.
22. **Kumar, A.,** Kushalappa, A.C. *WIN1* transcription channelizes free fatty acids to enforce cuticle in barley spikelets to confer fusarium head blight resistance. From: January 9-13, 2016 at Plant & Animal Genomics XXIV-2016, San Diego, USA. **(Poster presentation)**.
23. **Kumar, A.,** Kushalappa, A.C. Metabolo-genomics revealed the involvement of fatty acids in cuticle biosynthesis in barley against fusarium head blight. At 20th Penn State Plant Biology Symposium on May 13-16, 2015 University Park, Pennsylvania, USA. **(Poster presentation and Oral talk)**.
24. **Kumar, A.** Understanding the molecular mechanisms of verticillium wilt in potato. NCCC215 Potato Breeding and Genetics Technical Committee Meeting Holiday Inn Express at O'Hare, Chicago, Illinois from December 7-8, 2015 **(Oral talk)**.
25. Participated in 5th annual plant sciences symposium on "*Leveraging Data in Plant Sciences: In Vivo, In Vitro, In Silico"* on November 5th, 2015 at Wisconsin Institute of Discovery, University of Wisconsin, Madison, USA. **(Participation)**.
26. **Kumar, A**., Dutt, S., Bagler, G., Ahuja, P.S., Kumar, S. Mutation of free Cys-95 to Ala at dimer interface of Cu,Zn superoxide dismutase enhances thermostability. Abstract published in 27th Annual Symposium of The Protein Society (USA) in the "Protein Science" Special issue: Volume 22, Issue Supplement S1, Pages i-ii, 1-258, August 2013. **(Abstract)**.
27. **Kumar, A**., Bhardwaj, P.K., Dutt, S., Kumar, S., Ahuja, P.S. Autoclavable and low temperature operative superoxide dismutase. Poster presented in the XVIIIth International Botanical Congress held at Melbourne, Australia from 23rd -30th July, 2011. **(Poster presentation)**.
28. **Kumar, A**., Bhardwaj, P.K., Dutt, S., Kumar, S., Ahuja, P.S. Bioprospecting western Himalayan flora for thermostable Cu/Zn superoxide dismutases. National Symposium on Plant Propagation, conservation, Modification and Characterization & 30th Annual Meeting of Plant Tissue Culture Association (India). Institute of Himalayan Bioresource Technology Palampur, April 3-4, 2009. Abstract no. 102. Page no. 64. **(Poster presentation)**.
29. Participated in 13th International Conference on "Genomics and Future of Medicine", in Hyderabad (India) held on 27th September-30th September 2008. **(Participation)**.

Invited Lectures

1. Delivered an invited talk on "Innovations in Enzyme Technologies and Plant–Microbe Interactions for a Sustainable Future" at an International Conference on "Multidisciplinary

Innovations in Green Energy and Disaster Resilience in a Data-Driven Quantum Era", held from 1–3 June 2026.

2. Delivered an invited talk on "Enzymes for Sustainable World" in the National Conference on "Nurturing Young Minds for Scientific Innovations–2025 (NYMSI-2025)", held on May 15–16, 2025, at the Shahpur Campus of CUHP, Himachal Pradesh.
3. Delivered an invited talk on "Pinpointing the molecular determinants of rice - *Rhizoctonia solani* interactions to develop sheath blight tolerance in rice" in an ICAR sponsored short course on "Biotechnological and conventional tools for biotic and abiotic stress management" from February 10-19, 2026 at School of Agricultural Biotechnology, PAU, Ludhiana.
4. Delivered a Lead lecture on "Decoding the virulence strategies of *Rhizoctonia solani* AG1-IA to develop sheath blight resistance in rice" at National Symposium of Himalayan Phytopathological Society" held from 7th- 8th November 2024, at CSKHPKV, Palampur.
5. Delivered a talk on "Decoding the virulence strategies of *Rhizoctonia solani* AG1-IA to engineer rice for tolerance to sheath blight disease" at "An international conference on Exploring the Microbial World: From Human Health to Environmental Sustainability held from 2nd-5th April 2024 at Delhi University, North Campus, New Delhi.
6. Delivered a contributory talk on "Understanding the molecular intricacies of Rice-*R. solani* AG1-IA interactions to develop sheath blight resistance in rice" at a national conference on "Genomic Revolution to Foster Advances and Innovations in Crop Improvement" held from 27th - 29th February 2024, at Punjab Agricultural University, Ludhiana.
7. Delivered an invited lecture entitled "Superoxide dismutase enzyme: an industrially important enzyme" on 13.03.2023 at Advanced E-SDP on Entrepreneurship Skill Development on Enzyme Bioprocessing Sponsored by DC (MSME), Govt. of India, New Delhi and organized by CSIR-IHBT, Palampur, H.P.
8. Delivered an invited lecture entitled "Molecular dissection of Rice-*R. solani* AG1-IA interactions to develop sheath blight resistance in rice" on 19.11.2022 in a DST Stuti program on Advances in Functional Genomics & Gene Editing, Panjab University, Chandigarh.
9. Delivered an invited lecture entitled "Superoxide dismutase enzyme: an industrial perspective" on 28.11.2022 at "Hands on Training Program on Development of Nutraceutical based Formulations and their Characterization" organized under accelerated Vigyan Scheme by CSIR-IHBT, Palampur, H.P.
10. Keynote speaker in a one-day virtual symposium on "Application of Next-Generation Data Analysis in Omics organized by School of Agricultural Biotechnology, PAU, Ludhiana on 26.10.2020. Delivered a talk on "Dissection of resistance mechanisms in cereal and horticultural crops against fungal pathogens".
11. Delivered a seminar entitled "Dissecting disease resistance mechanisms in potato for verticillium wilt" at Vegetable Science department of Punjab Agricultural University, Ludhiana on 07-03-2017.
12. Molecular determinants of resistance in plants against fungal diseases at CAFT training, Department of Plant Breeding and Genetics, PAU, Ludhiana in Aug. 2019.

Theses and Projects Supervision

1. **PhD students:** Mr. Asheesh Dhiman, Miss Mahima Chauhan, Miss Apoorva Prasad, Miss Akshita Goel, Mr Naveen Kumar: all these students are currenty enrolled under AcSIR for

their Ph.D. degree..

Workshops/Trainings

1. Participated in State Level Biosafety Capacity Building Workshop under the UNEP-GEF supported Phase-II Capacity Building Project on Biosafety at PAU, Ludhiana on February 16, 2018.
2. Training Program on Intellectual Property Rights (October 4-6, 2004), sponsored by National Bioresource development Board (Department of Biotechnology, Government of India, New Delhi).
3. Successfully completed core training on "Workplace Hazardous Material Information System (W.H.M.I.S) conducted by McGill University Environment Health and Safety Operations at McGill University, Montreal, Canada on Oct. 07, 2013.
4. Training on thermal and near infra-red imaging as precision agriculture tools at Phenotyping laboratory, Washington State University, Pullman, USA from 04-03-2017 to 04-07-2017.

Extension and Outreach Activities

1. Organized a two days training program on "Tools and Techniques in Molecular Biology" for M.Sc. students of Dardar Ballabh Bhai Patel University, Mandi, H.P. from 22-23rd December 2023 at CSIR-IHBT, Palampur.
2. Invited as a member of Panel Discussion team in a conference on Sustainable Progress: Global Perspective on Public Private Partnership (PPP) investments organized by Panjab University, Chandigarh on 29th Nov. 2023.
3. Invited as a Guest of honour for a one day workshop on IPR at Sri Sai University, Palampur, H.P. on 27th July, 2023.
4. Invited as a Chief Guest in a Science Fair organized by Rastriya Aavishkar Abhiyan Samagam Shiksha (H.P.) organized by Govt. Utkrishat Sr. Sec. School, Saliana on 28th Nov. 2022.
5. Participated in Kisan Mela at PAU, Ludhiana, from 24th-25th March, 2018.
6. Participated in WPVGA Grower Education Conference and Industry Show at Stevens Point, Wisconsin, USA from February 2-4, 2016.
7. Actively Participated in Science expedition as a presenter at Institute of Discovery, UW-Madison organized by UW-Madison Science Outreach and UW Science Alliance on 2nd April, 2016.
8. Presented at STEM program for woman at University of Wisconsin- Milwaukee, Stevens Point, USA on 27-02-2016.

Reviewer of Scientific Journals

1. BMC genomics (BioMed Central)
2. Genomics (Elsevier)
3. Environmental and Experimental Botany (Elsevier)
4. Physiologia Plantarum (Wiley)
5. PeerJ

6. Phytochemical Analysis (Wiley)
7. Plant Disease (American Phytopathological Society)
8. Scientific Reports (Nature Publishing Group)
9. Functional and Integrative Genomics (Springer)
10. Plant Biology (Wiley)
11. Journal of Cereal Science (Elsevier)
12. American Journal of Potato Research (Springer)
13. HortScience (American Society for Horticultural Science)
14. Evolutionary Bioinformatics (SAGE journals)
15. Journal of Food Processing and Preservation (Wiley)
16. Journal of Food Science and Technology (Springer)
17. OPEN AGRICULTURE (DE/G)
18. Reviewer of a proposed book entitled "Food Safety – Grain Based Foods by Editor Bianchini et al" for Elsevier Publishing Group.

Member of National / International Committees for evaluation / funding / review of scientific research

1. Expert Member of the DBT–BIRAC Joint Screening-cum-Selection Committee under the BioE3 Policy (2025–2028). In this role, I evaluated high-impact research and innovation proposals and served as Lead Discussant for assigned projects under the "Biomanufacturing for Climate-Resilient Agriculture" theme, contributing to the advancement of sustainable scientific solutions for societal and environmental challenges.
2. Technical expert panel member for BIRAC's (Biotechnology Industry Research Assistance Council) Biotechnology Ignition (Grant) funding program to evaluate proposals at IIT, Kanpur in 2018 & 2019.
3. Technical reviewer of BIRAC's BIG funding program to evaluate proposals.

Awards and Fellowships

1. Awarded with prestigious **"Ramanujan Fellowship"** by SCIENCE & ENGINEERING RESEARCH BOARD, DST, GOI for the research project.
2. **Shimamoto Travel Award** to attend the IS-MPMI XVII Congress, July 17-21, 2016 in Portland, Oregon, USA.
3. **Start Up Research Grant (Young Scientist),** by SCIENCE & ENGINEERING RESEARCH BOARD, DST, GOI for the research project "Cisgenetic engineering of rice (*Oryza sativa*) susceptible elite cultivars for enhanced disease resistance using genome editing CRISPR/Cas9 technology". **(Didn't avail it).**
4. **Travel Grant** to attend 20th Penn State Plant Biology Symposium on May 13-16, 2015 University Park, Pennsylvania, USA.
5. Conferred "**Protein Science Young Investigator Travel Grant**" from The Protein Society, USA to attend "The Protein Symposium-2013" held at Boston, MA, USA.

6. **Travel grant** from Department of Science and Technology (DST) and perdeim from Indian National Science Academy (INSA), Govt. of India to attend 13th International Botanical Congress at Melbourne, Australia in 2011.
7. Awarded with "**CSIR-Senior Research Fellowship"** in 2008.
8. Successfully qualified "**CSIR-UGC Test for lectureship (NET)"** *in Dec 2004 in Life Sciences* awarded by Council of Scientific and Industrial Research (CSIR), Govt. of India.
9. Successfully qualified "**Graduate aptitude test for engineering (GATE)"** with 94.82 percentile in 2004 conducted jointly by the Indian Institute of Science and seven Indian Institutes of Technology.
10. Received "**National merit certificate**" in recognition of high position secured in the list of meritorious candidates qualifying for awards from HP Board in 1995.