Vivek Dogra, PhD

Senior scientist & Assistant Professor (AcSIR),
CSIR-Institute of Himalayan Bioresource Technology,
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Google Scholar: http://scholar.google.com/citations?user=3Zfem6QAAAJ&hl=en

Professional experience:

Duration	Designation	Institution
04/2024 - Present	Principal Scientist	CSIR-Institute of Himalayan Bioresource Technology, Palampur-176061, India
04/2020 – 04/2024	Senior Scientist	CSIR-Institute of Himalayan Bioresource Technology, Palampur-176061, India
01/2019 - 03/2020	PIFI Postdoctoral Fellow	Shanghai Center for Plant Stress Biology, Chinese Academy of Sciences (CAS), Shanghai- 201602, China
11/2014 - 02/2019	Postdoctoral Fellow	Shanghai Center for Plant Stress Biology, Chinese Academy of Sciences (CAS), Shanghai- 201602, China
04/2012 - 10/2014	Junior Research Fellow	CSIR-Institute of Himalayan Bioresource Technology, Palampur-176061, India
10/2007 - 03/2012	Senior Research Fellow	CSIR-Institute of Himalayan Bioresource Technology, Palampur-176061, India
07/2006 - 10/2007	Research Biologist	Panacea Biotech Limited, Mohali -145001, India

Education:

Degree	Duration	Subject/specialization	Institution
PhD	01/2009 - 03/2015	Plant Biotechnology	CSIR-Institute of Himalayan Bioresource Technology, Palampur-176061, India
MSc	06/2004 - 05/2006	Molecular Biology and Biochemistry	Guru Nanak Dev University, Amritsar, India
BSc	06/2001 - 05/2004	Medical	Himachal Pradesh University, Shimla, India

Research Interests and Focus

Research Interest: Plant Molecular Biology, Plant stress signaling (Abiotic and Biotic), Chloroplast-to-nucleus retrograde signaling, Post-translational modifications

Research Focus:

The ever-changing climate poses a significant challenge, as it disrupts the growth and development of plants. Therefore, plants need to develop adaptation strategies. Ample evidence in recent years has shown that chloroplasts act as sensors of environmental cues, priming the plant response to deal with adversity. Taking this into account, we are interested in understanding:

(i) How plants sense and manage environmental perturbations such as high light, temperature, and pathogens, with an emphasis on the role of the chloroplast in this process.

(ii) Impact of stresses on chloroplast protein homeostasis directly affecting photosynthetic machinery, to engineer stress-resilient photosynthetic apparatus.

(iii) Identification and characterization of various phytoelicitors, including reactive electrophile species, metabolites, and phytohormones released as retrograde signals from chloroplasts that prime stress responses in high-altitude plants

For our research, we are investigating Tea (Camellia sinensis), Setaria italica (Foxtail millet), Arabidopsis thaliana and High Altitude Extremophytes, employing forward and reverse genetics, genetic engineering, cell biology, and multi-omics.

Ongoing projects:

We are now delineating other retrograde signaling cascades operating and priming plant responses in Himalayan plants (**Trends in Plant Sci 2023**). In addition, we are interested in identifying and characterizing various phytoelicitors, including reactive electrophile species, metabolites, and phytohormones released as retrograde signals that prime stress responses in high-altitude crop and medicinal plants (**Physiol Plantarum 2023**). Some of the ongoing projects include:

1. Understanding how chloroplast senses environmental (abiotic and biotic) signals and triggers retrograde signaling cascades priming plant responses
2. Deciphering the mechanisms and relevance of translocation of pathogen effector and host proteins to the chloroplast upon elicitation
3. Understanding adaptive mechanisms attributing to stress-resilience in plants, especially in high-altitude extremophiles

Research Publications:

(Number of Articles: **47**; Book chapters: **03**, Citations: **1972**, *h*-index: **25**)

S. No.	Details of Articles	Journal /Volume/Page	Year
1.	Godara R, Mohapatra S, Thakur S, Roy A, Vaishnavi S, Anmol, Sharma U, KHallan V, Kumar A & **Dogra V*** Membrane lipid-derived heptanedioic acid primes defence and systemic growth in plants	***Plant Physiology*** (accepted	2026
2.	Ghosh D, Thakur S, Bali S, Sharma S & **Dogra V*** Comparative genome-wide analysis in Setaria italica and Arabidopsis thaliana revealed functional conservation of specific FtsH proteases under high light and heat stress.	***Plant Cell Reports*** 10.1007/s00299-026-03754-4 2026	2026
3.	Verma A, **Dogra V**, Shree B, Chandel SS, Nayyar H, Rathour R & Sharma KD* Identification, Characterization and Expression Analysis of Calmodulin and Calmodulin-Like Protein Genes with Emphasis on Reproductive Organs of Chickpea (Cicer arietinum L.).	**Plant Molecular Biology Reporter** 10.1007/s11105-026-01689-4	2026
4.	Mohapatra S, Ghosh D, Bali S, Twinkle, Gautam A & **Dogra V*** An improved method for isolating intact chloroplasts from different plant species.	***Journal of Plant Growth Regulation*** 10.1007/s00344-025-	2025

		11911-4	
5.	Yadav S, Ghosh D, Twinkle & **Dogra V*** Bipaternal plastid inheritance and its implications in plastid genome engineering.	***Plant Cell Reports*** 10.1007/s00299-025-03631-6	2025
6.	Mohapatra S, Mishra A, Godara R, Bali S, Twinkle, Kumar A, Kumar R, Kumar N, Kumar P, Acharya V & **Dogra V*** Oxidative stress-induced proteolytic activation of polyphenol oxidase triggers an oxidized flavonoids-mediated stress signaling in Camellia sinessis.	***bioRXiv*** 10.1101/2025.09.23.677533	2025
7.			
8.	Devi B, **Dogra V**, Mali S, Nayyar H, Rathour R, Sharma KD Sugar Transporter Protein (STP) Genes in Chickpea	***Tropical Plant Biol.*** doi.org/10.1007/s12042-025-09421-4	2025
9.	Bali S, Mohapatra S, Michael R, Arora R, **Dogra V*** Plastidial metabolites and retrograde signaling: a case study of MEP pathway intermediate MEcPP that orchestrates plant growth and stress responses.	***Plant Physiology and Biochemistry*** doi.org/10.1016/j.plaphy.2025.109747	2024
10.	Bali S, Gautam A, Dhiman A, Michael, R, **Dogra V*** Salicylate and jasmonate interwine in ROS-triggered chloropalst-to-nucleus retrogrdae signaling.	***Physiologia Plantarum*** doi.org/10.1111/ppl.14041	2024
11.	Michael R, Bali S, Godara R, **Dogra V***. Endosperm: Thermal Sensor and Regulator of Seed Thermoinhibition.	***Trends in Plant Science*** doi.org/10.1016/j.tplants.2023.06.017	2023
12.	Kato Y, Kuroda H, Ozawa SI, Saito K, **Dogra V,** Scholz M, Zhang G, Vitry C, Ishikita H, Kim C, Hippler M, Takahashi Yand Sakamoto W* Characterization of Tryptophan Oxidation Affecting D1 Degradation by FtsH in the Photosystem II Quality Control of Chloroplasts.	***eLife*** doi.org/10.7554/eLife.88822.1	2023
13.	Kumar V, Chaudhary P, Prasad A, **Dogra V**, Kumar A Jasmonic acid limits Rhizoctonia solani AG1-IA infection in rice by modulating reactive oxygen species homeostasis.	***Plant Physiology & Biochemistry*** 196: 520-530	2023
14.	Ghosh D, Mohapatra S, **Dogra V***. Improving photosynthetic efficiency by modulating non-photochemical quenching.	***Trends in Plant Science*** 28(3): 264-266	2023
15.	Neha, Twinkle, Mohapatra S, Sirhindi G, **Dogra V*** Seed priming with brassinolides improves growth and reinforces anti-oxidative defenses under normal and heat stress conditions in seedlings of *Brassica juncea*	***Physiologia Plantarum*** 174(6):e13814	2022
16.	Fang J, Li B, Chek LJ, **Dogra V**, Luo S, Wang P, Hwang I, Li H, Kim C. TIC236 gain-of-function mutations unveil the link between plastid division and plastid protein import	***PNAS USA*** 119 (11) e2123353119	2022
17.	Kumari A, **Dogra V**. Joshi R and Kumar S Stress-responsive *cis*-regulatory elements underline podophyllotoxin biosynthesis and better performance of *Sinopodophyllum hexandrum* under water deficit conditions	***Frontiers in Plant Science*** 12:751846	2022

18.	**Dogra V**, Singh RM, Li M, Li M, Singh S, and Kim C EXECUTER2 modulates the EXECUTER1 signalosome through its singlet oxygen-dependent oxidation	***Molecular Plant*** 15(3): 438-453	2022
19.	Li M, Lee KP, Liu T, **Dogra V**, Duan J, Li M, Xing W, Kim C Antagonistic modules regulate photosynthesis-associated nuclear genes via GOLDEN2-LIKE transcription factors	***Plant Physiology*** 188(4): 2308-2324	2021
20.	Sharma M, Anand P, Padwad YS, **Dogra V*** and Acharya V* DNA damage response proteins synergistically affect the cancer prognosis and resistance	***Free Radical Biology and Medicine*** 178, 174-188	2021
21.	Medina-Puche L, Kim C, Lozano-Duran R, **Dogra V*** Protocol for evaluating protein relocalization from the plasma membrane to chloroplasts	***STAR Protocols*** 2 (4), 100816	2021
22.	Sawrnkar MK, Kumar P, Dogra V, Kumar S. Prickle morphogenesis in Rose is coupled with secondary metabolite accumulation and governed by canonical MBW transcriptional complex	***Plant Direct*** 5(6):e00325	2021
23.	Kumar A, Guleria S, Ghosh D, **Dogra V***, Kumar S Managing reactive oxygen species-Some learnings from high altitude extremophytes.	***Environmental Experimental Botany*** 189: 104525	2021
24.	Medina-Puche L, Tan H, **Dogra V**, Wu M, Rosas-Diaz T, Wang L, Ding X, Zhang D, Fu X, Kim C and Lozano-Duran R. A Defense Pathway Linking Plasma Membrane and Chloroplasts and Co-opted by Pathogens.	***Cell*** 182(5):1109-1124.e25	2020
25.	Li B, Fang J, Singh RM, Lv S, Zi H, Liu R, **Dogra V*** and Kim C. FATTY ACID DESATURASE 5 is Required to Induce Autoimmune Response in Gigantic Chloroplast Mutants of Arabidopsis. **[*Co-corresponding author]**	***The Plant Cell*** 32(10): 3240-3255	2020
26.	Wang F, Fang J, Guan K, Luo, S, **Dogra V**, Li B, Ma D, Zhao X, Lee KP, Sun P, Xin J, Liu T, Xing W and Kim C. The Arabidopsis CRUMPLED LEAF protein, a homolog of the cyanobacterial billin lyase, retains the phycocyanobilin binding pocket for a yet unknown function.	***Plant Journal*** *104: 964-978*	2020
27.	Lee KP, Liu K, Kim EY, Medina-Puche L, Dong H, Duan J, Li M, **Dogra V**, Li Y, Lv R, Li Z, Lozano-Duran R and Kim C. Intercellular signaling mediated by PNP-A and its cognate receptor protein PNP-R2 counteracts SA-mediated signaling and the SA-primed cell death pathway.	***The Plant Cell*** 32 (7) 2237-2250	2020
28.	Li Z[#], **Dogra V**[#], Lee KP, Li R, Li M, Li M and Kim C. N-terminal acetylation stabilizes SIB1 involved in salicylic acid-primed cell death.	***Plant Physiology*** 183(1):358-370	2020
29.	**Dogra V** and Kim, C. Singlet Oxygen Metabolism: from Genesis to Signaling.	***Frontiers in Plant Science*** 10:1640	2020

30.	**Dogra V** and Kim, C. Chloroplast protein homeostasis is coupled with retrograde signaling.	***Plant Signaling & Behavior*** 14:11	2019
31.	**Dogra V**[#], Li M[#], Singh S#, Li M and Kim C. Oxidative post-translational modification of EXECUTER1 is required for singlet oxygen sensing in plastids.	***Nature Communications*** 10:2834	2019
32.	Duan J[#], Lee KP[#], **Dogra V**[#], Zhang S, Liu K, Caceres-Moreno C, Lv S, Xing W, Kato Y, Sakamoto W, Liu R, Macho AP and Kim C. Impaired PSII proteostasis promotes retrograde signaling via salicylic acid.	***Plant Physiology*** 180(4):2182-2197.	2019
33.	**Dogra V**[#], Duan J[#], Lee KP, and Kim C. Impaired PSII proteostasis triggers an UPR-like response in the var2 mutant of *Arabidopsis thaliana*.	***Journal of Experimental Botany*** 70(12):3075-3088	2019
34.	Lv R, Li Z, Li M, **Dogra V**, Lv S, Liu R, Lee KP* and Kim C Uncoupled expression of photosynthesis-associated genes contributes to cell death in lesion-mimicking mutant.	***The Plant Cell*** 31 (1): 210-230	2019
35.	**Dogra V,** Rochaix, J-D, and Kim C. Singlet oxygen-triggered chloroplast-to-nucleus retrograde signaling pathways: an emerging perspective.	***Plant Cell and Environment*** 41(8):1727-1738	2018
36.	**Dogra V**, Duan J, Lee KP, Lv S, Liu R and Kim C. Proteolysis of EXECUTER1 is essential in mediating singlet oxygen-triggered retrograde signaling in *Arabidopsis thaliana*.	***Frontiers in Plant Science*** 8:1145	2017
37.	Wang L, Kim C, Xu X, Piskurewicz U, **Dogra V**, Singh S, Mahler H and Apel K. Singlet oxygen- and EXECUTER1-mediated signaling is initiated in grana margins and depends on the protease FtsH2.	***PNAS USA*** 113(26): E3792-800	2016
38.	**Dogra V,** Sharma R and Sreenivasulu Y. Xyloglucan endo-transglycosylases/hydrolase (XET/H) gene is expressed during the seed germination in *Podophyllum hexandrum*: a high altitude Himalayan plant.	***Planta*** 244:505-515	2016
39.	Kaushal R, Sharma N and **Dogra V**. Molecular characterization of Glycosyl hydrolases of *Trichoderma harzianum* WF5 - a potential strain isolated from decaying wood and their application in bioconversion of poplar wood to ethanol under separate hydrolysis and fermentation.	***Biomass and Bioenergy*** 85: 243-251	2016
40.	**Dogra V,** Bagler G and Sreenivasulu Y. Re-analysis of protein data reveals the germination pathway and up accumulation mechanism of cell wall hydrolases during the radical protrusion step of seed germination in *Podophyllum hexandrum* - a high altitude plant.	***Frontiers in Plant Science*** 6:874	2015

41.	Kaushal R, Sharma N and **Dogra V**. Optimization of the production and molecular characterization of cellulase-free xylanase from an alkalophillic *Bacillus subtilis* SD8 isolated from paper mill effluent.	***Applied Biochemistry and Microbiology*** 51(5): 551-559	2015
42.	Kaur D[#], **Dogra V[#],** Thapa P, Sood A, Bhattacharya A and Sreenivasulu Y. *In vitro* flowering associated protein changes in *Dendrocalamus hamiltonii*.	***Proteomics*** 15:1291-1306	2015
43.	**Dogra V** and Sreenivasulu Y. Cloning and functional characterization of β-1, 3-glucanase gene from *Podophyllum hexandrum* - A high altitude Himalayan plant.	***Gene*** 554(1):25-31	2015
44.	Shafi A, **Dogra V**, Gill T, Ahuja PS and Sreenivasulu Y. Simultaneous Over-Expression of *Pa*SOD and *Ra*APX in Transgenic Arabidopsis thaliana Confers Cold Stress Tolerance through Increase in Vascular Lignifications	***PLOS One*** 9(10): e110302	2014
45.	Deswal R, Gupta R, **Dogra V**, Singh R, *et al*. Plant Proteomics in India and Nepal: Current Status and Challenges Ahead.	***Physiology and Molecular Biology of the Plants*** 19(4): 461-477	2014
46.	**Dogra V**, Ahuja PS and Sreenivasulu Y. Change in protein content during seed germination of a high altitude plant *Podophyllum hexandrum* Royle.	***Journal of Proteomics*** 78: 26-38	2013
47.	Gill T, **Dogra V**, Sreenivasulu Y, Kumar S and Ahuja PS. Protein dynamics in Arabidopsis seeds over-expressing Potentilla superoxide dismutase during germination under copper stress.	***Journal of Plant Research*** 125(1):165-172	2012

Research Grants/Fundings:

Ongoing:

S. No	Title of the project	Project Type/Category	Budget sanctioned	Sponsoring agency	PI/Co-PI
1.	Deciphering the stress-induced and chloroplast-triggered programmed cell death in Arabidopsis thaliana	National Project (Frontiers in Biotechnology)	77.05 lakhs for 3 years (2024-2027)	DBT	PI
2.	Improving steviol glycoside contents in Stevia by modulating SG pathway enzymes	National Project (Genome Editing Mission)	320 lakhs for 3 years (2024-2027)	CSIR	PI
3	Elucidation of plant responses to high UV radiation and low temperature stress at high altitudes in Juniperus polycarpos K. Koch, a highly adapted woody evergreen species of Trans-Himalaya	National Project (Core Research Grant; CRG)	48 lakhs For 3 years (2023-2026)	SERB, DST	Cpo-PI

Completed:

S. No	Title of the project	Project Type/Category	Budget sanctioned	Sponsoring agency	PI/Co-PI

1.	Understanding the molecular mechanism underlying cambial meristematic cells (CMCs) differentiation and their utilization for specialized metabolite production in *Picrorhiza kurrooa*	National Project (Core Research Grant; CRG)	45 lakhs For 3 years (2023-2026)	SERB, DST	Cpo-PI
2.	Captive cultivation, development of location-specific-agrotechnology, downstream processing and value-addition of Mentha piperita: A sustainable option for livelihood improvement and security in the western Himalayan Region	National project (DBT Himalayan Mission)	118 Lakhs for 3 years (84 lakhs for CSIR-IHBT) (2022-2025)	DBT	Co-PI
3	Unraveling how Polyphenol oxidase (PPO) senses stress and triggers retrograde signaling through theaflavins to induce stress resilience in Tea (*Camellia sinensis*)	National Project (CSIR-CSPS2024-SeedFund)	23.12 Lakhs for 2 years (2024-2026)	CSIR	PI
4.	Deciphering Chloroplast Oxi-Proteome for Engineering Oxidative Stress Resilient Chloroplasts in Plants	Research grant (Ramalingaswami Fellowship)	42.5 Lakhs for 5 years (2020-2025)	DBT	PI
5.	Role of viral and host factors in circulative transmission of tomato begomoviruses by the whitefly Bemisia tabaci	Indo-French International Project	175 lakhs for 3 years (83 lakhs for CSIR-IHBT) (2022-2025)	IFCPRA /DST	Co-PI
6.	Deciphering the mechanism of epidermal cell differentiation leading to prickle formation in *Rosa hybrida*	National project (SRG)	27 Lakhs for 2 years (2022-2024)	DST	PI
7.	Revealing the Chloroplast Oxi-proteome and Engineering ROS-insensitive Photosynthetic Apparatus	National project (FIRST)	95 Lakhs for 2 years (2022-2024)	CSIR	PI
8.	Linking the chloroplast-triggered programmed cell death with the coordination between chloroplast division and cell cycle in Arabidopsis thaliana	International (Regional) Cooperation and Exchange Project category	400,000 RMB for 2 years (2019 - 2020)	National Natural Science Foundation of China	PI

Mentorship/Supervision

- Guided 2 PhD students (Completed)
- Currently guiding 2 PhD students, 3 Postdocs, and 3 project associates
- Mentored 1 Post-doc, 4 PhD and 2 Master students at Shanghai Center for Plant Stress Biology, Shanghai, PR China (during 2014-2020)
- Supervised several undergraduate research trainees at CSIR-Institute of Himalayan Bioresource Technology, Palampur, India (during 2007-2014)

Memberships of Professional Societies:

1. Member of International Plant Proteomics Organization (**INPPO**) *www.inppo.com*
2. Member of Asia-Pacific Chemical, Biological& Environmental Engineering Society (**APCBEES**) (member no **200340)** *www.cbees.org*

3. Nominated member of the **German Society of Proteome Research (DGPF)** (2013-14).
4. Member of **Indian Society of Plant Physiology** (**ISPP**).

Reviewing/editorial responsibilities:

Editorial: Frontiers in Plant Science (Review Editor- Plant Abiotic Stress section), Frontiers in Genetics (Review Editor- Genomics), PlosOne (Academic editor), Plant Physiology Reports (Asscoiate Editor)

Reviewing: Nature Plants, Nature Communications, PNAS, The Plant Cell, Molecular Plant, New Phytologist, Plant Physiology, Physiologia Plantarum, Food Chemistry, Protoplasma, Plant Signaling and Behavior, Gene, PLoS ONE, Molecular Biology Reports, Plant Physiology and Biochemistry, Industrial crops and Products, Scientific Reports Plant Gene

Honors and accomplishments

1. Conferred **RD Asana Gold Medal Award 2023** by **Indian Society of Plant Physiology (ISPP)** for significant contributions in Plant Physiology
2. Selected as a **Member of the Indian National Young Academy of Sciences (INYAS), INSA, in 2023.**
3. **ISPP-ASPB Young Scientist Award of Indian Society of Plant Physiology** at the 5th International Plant Physiology Congress (iFANS-2023).
4. **Ramalingaswami Re-entry fellowship 2019-20** by the Department of Biotechnology, GOI, in March 2020.
5. **President's International Fellowship Initiative (PIFI) Postdoctoral fellowship** by the Chinese Academy of Sciences (CAS) in Dec 2018 for two years; 2019-2020).
6. Received a **research grant as an International Young Scientist** from the National Natural Science Foundation of China (NSFC) in August 2018 for two years; 2019-2020.
7. **Dr. D.S. Kothari Postdoctoral Fellowship** by University Grants Commission (UGC), GOI in June 2015.
8. Received **International Travel Grant** from SERB, DST, under the Young Scientist category to attend the international conference Proteomic Forum 2013 in Germany in March 2013.
9. **Senior Research Fellowship** by CSIR, GOI, in Jan 2012.
10. Qualified **CSIR/UGC NET LS in Life sciences** twice in June 2006 and Dec 2008.
11. Qualified **Radiological Safety Officer (level 1)** exam at AERB, BARC, INDIA in April 2007.
12. University **Gold Medalist** in Post-graduation (in 2006).

Professional Referees

1. **Dr. Sudesh Kumar Yadav**, PhD (FNAAS, FNASI)
   Director, CSIR-Institute of Himalayan Bioresource Technology,
   Palampur 176061, INDIA, Phone:(91) 1894-230433, Email: director@ihbt.res.in

2. **Dr. Sanjay Kumar**, PhD (FNA, FNAAS, FNASI,)
   Former Director, CSIR-Institute of Himalayan Bioresource Technology,
   Palampur 176061, INDIA,
   Chairman, ASRB, New Delhi, INDIA; Email: sanjayplp1@gmail.com

3. **Prof. Chanhong Kim**, PhD (Postdoctoral Supervisor)
   Professor, Center for Excellence in Molecular Plant Sciences (CEMPS),
   Shanghai Center for Plant Stress Biology (PSC), Shanghai, PR China, Phone:(86) 21- 57078272
   Email: chanhongkim@sibs.ac.cn

4. **Prof. Y Sreenivasulu**, PhD (PhD Supervisor)
   Professor, Hyderabad Central University,
   Hyderabad 500007, AP, INDIA, Phone: +91 9418037339, Email: sree_yelam@yahoo.com