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Academic Qualification:

- Ph.D. (Biotechnology) from Shri Mata Vaishno Devi University, Katra (J&K)
- M.Sc (Biotechnology)(2004) from Barkatullah University, Bhopal (M.P)
- B.Sc (2001) from University of Jammu, Jammu (J&K)

Positions held:

- Joined as Assistant Professor, Department of Plant Science, School of Life Sciences, Central University of Himachal Pradesh on 15th January 2020
- Research Associate at School of Biotechnology, University of Jammu, Jammu (J&K) from 24-07-2014 to 31-03-2019
- Research Associate (T) at Plant Tissue Culture and Molecular Biology, The Energy and Resources Institute (TERI), Lodhi Road, New Delhi from 17-09-2007 to 23-11-2007
- Junior Research Fellow at Advanced Centre of Hill Bioresource and Biotechnology, CSKHPKV, Palampur (HP) from 11-10-2006 to 13-09-2007
- Project Assistant in CSIR Networking Project entitled "Cell and Tissue Engineering plant" at Indian Institute of Integrative Medicine, (Formerly, Regional Research laboratory) (CSIR) Canal Road, Jammu (J&K) from 18-05-2005 to 03-10-2006

Specialisation: Plant Biotechnology- *Micropropagation / Plant Metabolic Engineering*

Research Interest:

- Development of micropropagation systems for mass multiplication of Medicinal and Aromatic plants of therapeutic significance
- Modulation of secondary metabolite production in potential medicinal plants through Biotechnological approaches
- Functional genomics approaches for engineering of secondary metabolic pathways of medicinal and aromatic plants

Publications:

1. Anuja Koul, Munish Sharma, Ashok Ahuja and Sharada Mallubhotla (2020) Correlation between metabolic content, genetic markers and morphological traits in *Bacopa monnieri* (L.) Wettst. *Indian Journal of*

2. **Munish Sharma**, Anuja Koul, Ashok Ahuja and Sharada Mallubhotla (2019) Suitability of bench scale bioreactor system for shoot biomass production and bacoside biosynthesis from *Bacopa monnieri* (L.). *Engineering in Life Sciences*. 19(8): 584-590.
3. **Munish Sharma**, Sanjana Kaul and Manoj K. Dhar (2018) Transcript profiling of carotenoid / apocarotenoid biosynthesis genes during saffron (*Crocus sativus* L.) corm development. *Protoplasma*. 256(1):249-260.
4. Manoj K. Dhar, **Munish Sharma**, Archana Bhat, Nikhil K. Chrungoo and Sanjana Kaul (2017) Functional genomics of apocarotenoids in Saffron: insights from chemistry, molecular biology and therapeutic applications. *Briefings in Functional Genomics*. 16(6): 336-347.
5. Ashok Ahuja, **Munish Sharma**, Sharada Mallubhotla, M.K Tripathi and S.P. Singh (2017) Application of Bioreactor system for high throughput propagation of plants of medicinal importance - Some Case Studies. *Frontiers in Crop Improvement*. 5(1): 7-11.
6. **Munish Sharma**, Rajinder Gupta, Ravi Kant Khajuria, Sharada Mallubhotla and Ashok Ahuja. (2015) Bacoside biosynthesis during *in vitro* shoot multiplication in *Bacopa monnieri* (L.) Wettst. grown in Growtek and air lift bioreactor. *Indian Journal of Biotechnology*. 14(4): 547-551.
7. **Munish Sharma**, Ashok Ahuja, Rajinder Gupta and Sharada Mallubhotla (2014) Enhanced bacoside production in shoot cultures of *Bacopa monnieri* under the influence of abiotic elicitors. *Natural Product Research*. 29(8): 745-749.
8. **Munish Sharma**, Ravi Kant Khajuria and Sharada Mallubhotla (2013) Annual variation in bacoside content of *Bacopa monnieri* (L.) Wettst. plants. *International Journal of Pharma and BioSciences*. 4(4): 266- 271.
9. **Sharma Munish**, Raina Himani, Verma Vijeshwar, Mallubhotla Sharada and Ahuja Ashok (2012) Synthetic seeds a viable approach for conservation and propagation of phytoremediant herb - *Bacopa monnieri* (L.) Wettst. *Journal of Environmental Research and Development*. 7(1A): 399-404.

10. Jai Dev, Samuel Jeberson M, **Munish Sharma**, R Rathour and SR Thakur (2007) Molecular characterization of Hill Maize Inbreds using RAPD markers. *Indian Journal of Plant Genetic Resources.*, 20(1): 48-53.

Conference Proceedings as Full Paper

1. **Munish Sharma**, Archana Bhat, Sanjana Kaul and Manoj K. Dhar (2016) Functional and Structural characterization of Apocarotenoid biosynthesis genes in saffron (*Crocus sativus* L.). In: Rajinder Peshin, Ashok K. Dhawan, Fatima Bano and Kamail S. Risam (eds.). Natural Resource Management: Ecological Perspectives Vol.1 (ISBN 978-93-5254-337-3). Proceedings of the Indian Ecological Society: International Conference held at Sher-e Kashmir University of Agricultural Sciences and Technology, Jammu (J&K). pp. 337
2. Sharada M. Potukuchi, Surbhi Dubey, Imteyaz Ahmed, **Munish Sharma** and Ashok Ahuja (2009) Modulation of Plant Metabolite Production Through Elicitation: Production of Bacosides from *Bacopa monnieri*. Proceedings of International Colloquium on Biotechnology (DBT, DST, UGC & CSIR Sponsored) DAV College, Jalandhar, Punjab. pp.16-31.
3. Jai Dev, **Munish Sharma**, R Rathour and H K Chaudhary (2008) Genetic diversity among maize inbreds adapted to North Western Himalayan region of India revealed by functional SSR markers. In: Kenji Taniguchi and Xueyong Zhang (eds.). Advances in Chromosome Sciences Vol. 3: Development of Chromosome Research Network in Asia. Proceedings of 3rd Asian Chromosome Colloquium held at Osaka, Japan. pp. 146-147.

Book Chapter

1. **Munish Sharma**, Archana Koul, Deepak Sharma, Sanjana Kaul, Mallappa Kumara Swamy and Manoj K. Dhar (2019) Metabolic Engineering Strategies for Enhancing the Production of Bioactive Compounds from Medicinal Plants. In: Akhtar MS and Swamy MK (eds.). Natural Bioactive Compounds - Biotechnology, Bioengineering, and Molecular Approaches. Volume 3: Springer International, Singapore. DOI: 10.1007/978-981-13-743 (pp. 287-316)

Abstracts published

1. Ashok Ahuja, **Munish Sharma**, Sushma Koul and Sharada Mallubhotla. 'Production of quality herbs through high throughput propagation using Bioreactor

- systems'. National Conference on Interdisciplinary Aspects of Plant Sciences and 27th APSI Scientist meet', Organized by Department of Biotechnology, Shri Mata Vaishno Devi University, Katra, J&K in Collaboration with Academy of plant Sciences, India. November 02-04, 2017. pp. 29
2. Chainika Gupta, M.K. Dhar, Deepak Sharma and **Munish Sharma**. 'Expression profiling of carotenoid pathway genes in maize'. International Conference on Recent Trends in Bioinformatics and Biotechnology for Sustainable Development Organized by Faculty of Veterinary Sciences and AH, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu. October 12-13, 2017. pp. 57 (Abstract code: PPS1.6.)
 3. Sonal Mishra, **Munish Sharma**, Archana Bhat, S. Kaul and M.K.Dhar. 'Molecular investigation of diversified role of carotenoid cleavage dioxygenases (CCDs) in plants'. **Poster Presentation:** National Seminar on Recent Trends in Genomics and Metabolomics, Organized by University of Jammu, Jammu and Funded by University Grant Commission (UGC) under SAP-DRS-I Program. March 17-18, 2017.
 4. **Munish Sharma**, Archana Bhat, Sanjana Kaul and Manoj K. Dhar. 'Comparative gene expression patterns in different floral organs of Saffron (*Crocus sativus* L.)'. **Poster Presentation:** 12th JK Science Congress - 2017 Organized by Jammu University, Jammu. March 02-04, 2017. pp.111
 5. **Munish Sharma**, Archana Bhat, Sanjana Kaul and Manoj K. Dhar. 'Expression profiling of apocarotenoid biosynthesis genes during different stages of bud development in Saffron (*Crocus sativus* L.)' International Symposium on Plant Biotechnology for Crop Improvement (ISPBCI) (ISPBCI) - 2017, Organized by DBT Program Support Laboratory Department of Biosciences and Bioengineering, Indian Institute of Technology (IIT) Guwahati (Assam). January 20-21, 2017. pp. 48.
 6. Sudha Chib, **Munish Sharma**, Sanjana Kaul, Manoj K. Dhar. 'Somatic embryogenesis in Kashmir saffron. 4th J&K Women Science Congress (JKWSC), Organized by Govt. College for Women, Gandhi Nagar, Jammu in Collaboration with J&K Science Technology & Innovation Council, Department of Science and Technology, J&K. September 1-3, 2016. pp. 39
 7. Mallubhotla S., **Sharma M.** and Ahuja A. 'Production of bacosides from shoot cultures of *Bacopa monnieri* (L.) cultured in Growtek and Air Lift bioreactor'. Gordon Research Conference - Plant

8. Ashok Ahuja, Sharada M and **Munish Sharma**. 'Microbial elicitors application in plant secondary metabolites production using *in vitro* plant tissue culture system; 2 case studies. National Conference on Recent Trends in Applied Microbiology, Human Health and Environment, Organized by Department of Microbiology, Bundelkhand University, Jhansi (M.P) March, 2015
9. Deepak Sharma, **Munish Sharma**, Siama khan and Sushma Koul. 'Biochemical responses of a medicinal plant (*Salvia sclarea*) to Stress caused by various concentrations of mannitol'. 10th JK Science Congress - 2015 Organized by Jammu University, Jammu. March 14-16, 2015. pp. 61
10. Sharada Mallubhotla and **Munish Sharma**. 'Improved bacoside production using abiotic elicitors in shoot cultures of *Bacopa monnieri* (L.)'. 101th Indian Science Congress - 2014 Organized by Jammu University, Jammu. February 3-7, 2014. pp. 430.
11. Chowdhary Sonia, Kour Gurleen, **Sharma Munish**, Gupta Rajinder, Slathia Deepika and Mallubhotla Sharada. '*Bacopa monnieri*: A suitable phytoremediant for Copper contaminated soils'. National Conference on Energy, Environment and Biotechnology Research (NCEEER)-2013, Organized by Department of Biotechnology, Mewar Institute of Management, Ghaziabad (U.P.). October 5-6, 2013. pp. 297.
12. **Munish Sharma**, R.K. Jolly, Ravi Kant Khajuria, Ashok Ahuja and Sharada Mallubhotla. 'Bacoside production from multiple shoot cultures of *Bacopa monnieri* (L.) using air lift bioreactor'. First International and Third National Conference on Biotechnology, Bioinformatics and Bioengineering, Organized by Society for Applied Biotechnology at Tirupati, Andhra Pradesh. June 28-29, 2013. pp.143.
13. Kamana Jha, Ravi Kant Khajuria, Ashok Ahuja, **Munish Sharma**, Vijeshwar Verma and Sharada Mallubhotla. 'Fungal extracts as elicitors for bacoside production in *in vitro* cultures of *Bacopa monnieri*'. International Conference on Industrial Biotechnology (ICIB-2012), IX Convention of the Biotech Research Society, India and Indo-Italian Workshop on 'Food Biotechnology: Industrial Processing, Safety and Health' Organized by Department of Biotechnology, Punjabi University, Patiala (Punjab). November 21-23, 2012. pp. 249.
14. **Sharma Munish**, Ahuja Ashok, Khajuria R.K and

- Mallubhotla S. 'Influence of support matrix on *in vitro* shoot proliferation of *Bacopa monnieri* (L.) Wettst. enriched with bacoside accumulation'. National Seminar on Emerging Trends in Biotechnological Research (ETBR)-2012, Organized by Department of Biotechnology, Mewar Institute of Management, Ghaziabad (U.P.) in collaboration with Scientific & Applied Research Centre. October 28, 2012. pp. 217.
15. **Munish Sharma**, Himani Raina, Vijeshwar Verma, Sharada Mallubhotla and Ashok Ahuja. 'Synthetic seeds a viable approach for conservation and propagation of phyto remediant herb - *Bacopa monnieri* (L.) Wettst'. **Poster Presentation:** International Congress of Environment Research (ICER-2011), Organized by Journal of Environmental Research and Development (JERAD), Gujarat Pollution Control Board & SVNIT, Surat, Gujarat. December 15 - 17, 2011
 16. Sharada Mallubhotla, Radhika Khandelwal, Barneet Singh, Himani Raina, **Munish Sharma** and Vijeshwar Verma. 'Establishment of culture lines, protein estimation and phytochemical analysis in *Hypericum perforatum* (Linn.)'. National Conference on Emerging Trends in Medical Biotechnology & Nanotechnology (ETMBN-2011) Organized by Arni School of Basic Sciences, Arni University, Kangra (H.P.). December 3-4, 2011. pp. 49.
 17. **Munish Sharma**, Pramod Tandon and Suman Kumaria. 'Morphogenetic responses of *in vitro* germinated seedlings of *Cymbidium pendulum* (Sw.) in different media formulations and Phytohormone concentrations'. **Poster Presentation:** National Conference on Medicinal Orchids: Sustainable use and Benefit sharing for Rural and Tribal Communities Organized by The Orchid Society of India (TOSI), Department of Botany, Panjab University, Chandigarh. March 28-29, 2011. pp. 61.
 18. Payal Dhar, **Munish Sharma**, Vijeshwar Verma, Ashok Ahuja and Sharada Mallubhotla. 'Accumulation of solasodine in cell cultures, proliferative shoots and *in vitro* regenerated plants of *Solanum nigrum* (L.)'. National Conference on Metabolomics, Transcriptomics and Proteomics (NCMTP-2011), Shruti Auditorium, SGPGIMS, Lucknow. January 29-30, 2011.
 19. Sushma Koul, Manju Sambyal, Esha Abrol, **Munish Sharma** and Ashok Ahuja. 'Production of amarogentin and amaroswerin from *Swertia chirata* Buch. Ham. Shoot cultures in bioreactors'. National Symposium on Plant Propagation, Conservation, Modifications and Characterization Organized by Institute of Himalayan

Bioresource Technology, Palampur (HP). April 3-4, 2009.

20. Ashok Ahuja, **Munish Sharma**, Sushma Koul and G.N.Qazi. 'Improved shoot proliferation in liquid media using Growtek bioreactor and subsequent plant regeneration in endangered Himalayan herb, *Swertia chirata*'. National Symposium on Plant Biotechnology for Conservation, Characterization and Crop improvement Organized by Department of Biotechnology, Mohanlal Sukhadia University, Udaipur. February 8-10, 2008. pp. 163.

Research Projects Completed/Ongoing: MPhil/PhD Supervised/Supervising:

Nil

Nil

Fellowships/Awards::

- Teaching Research Assistantship from Shri Mata Vaishno Devi University, Katra during Ph.D. tenure
- Award of UGC Fellowship under the Basic Science Research (BSR) Program during Ph.D. tenure

Membership of Scientific /Academic Societies:

- Life Member, Indian Science Congress Association (ISCA), Kolkata, India
- Life Member, The Orchid Society of India (TOSI), Chandigarh, India

Training attended:

1. Hands on training on Bioreactor systems for cultivation of plant tissue and organ cultures at Plant Tissue Culture Group, Indian Institute of Integrative Medicine, CSIR (Formerly RRL), Jammu from 2nd Feb. - 30th April, 2012
2. Workshop on Hands-on Training in Bioinformatics at School of Biotechnology, SMVDU from 30th Aug.- 4th Sept., 2011
3. Training on operation and maintenance of HPLC system and techniques such as extraction, Column, Flash Chromatography used for isolation and purification of natural products at Analytical Chemistry Division, Indian Institute of Integrative Medicine (Formerly RRL, CSIR), Jammu from 18th - 29th July, 2011
4. Training on 'Handling of Analytical Instruments and Laboratory Techniques' at Environmental Research Laboratory, Bhopal from 29th April - 11th May, 2004
5. Training in 'Recombinant DNA technology & PCR' at Bangalore Genei Pvt.Ltd., Bangalore from 7th - 10th Jan., 2003.

**Workshop/Seminar
/Conference/Symposium
Attended**

1. National Seminar on Recent Trends in Genomics and Metabolomics organized by University of Jammu, Jammu and Funded by University Grant Commission (UGC) under SAP-DRS-I Program from 17th - 18th March, 2017
2. 12th JK Science Congress organized by Jammu University in collaboration with JKDST from 02nd - 04th March, 2017
3. One day Seminar on Fundamentals of Bioinformatics organized by Bioinformatics Centre, School of Biotechnology, University of Jammu sponsored by Department of Biotechnology, Govt. of India from 21st October, 2016
4. International Conference on 'Natural Resource Management: Ecological Perspectives' organized by The Indian Ecological Society at Sher-e- Kashmir University of Agricultural Sciences and Technology, Jammu from 18th -20th February, 2016
5. A Seminar cum Workshop on Towards Collaborative Metabolomics (Online) organized by Jointly by IIIT Hyderabad and JNU Delhi, supported by the Department of Biotechnology (DBT), GOI , 21th April, 2015
6. 10th JK Science Congress organized by Jammu University in collaboration with JKDST from 14th -16th March, 2015
7. 2nd National Interdisciplinary Science Symposium (NISS-II) organized by G.GM Science College, Jammu in collaboration with CSIR, JKDST, DBT from 27th - 28th Feb., 2015
8. National Conference on Orchids Science and Commerce: Integration of Medicinal Orchids, Sustainable Development and Societal Benefits organized by The Orchid Society of India, Department of Botany, Panjab University, Chandigarh and School of Biotechnology, Shri Mata Vaishno Devi University from 13th - 15th Feb., 2015
9. Workshop on Computational Core for Plant Metabolomics (Online) organized Jointly by IIIT Hyderabad and JNU Delhi, funded by the Department of Biotechnology (DBT), GOI, 30th July, 2014
10. Workshop on Recent Advances in Genomics and Proteomics organized by School of Biotechnology, SMVDU, Katra sponsored by Department of Biotechnology (DBT), GOI from 26th - 27th March, 2014

11. 101st Indian Science Congress organized by University of Jammu, Jammu from 3rd - 7th Feb., 2014
12. International Symposium on Biotechnological Advances in Cancer Biology (ISBAICB-2012), A Satellite Symposium of the Ataxia Telangiectasia organized by School of Biotechnology, Shri Mata Vaishno Devi University and National Centre of Applied Human Genetics, JNU, New Delhi, 13th Feb., 2012
13. One day National Symposium on Bioinformatics: Challenges in the post genomic era organized by Bioinformatics Centre, School of Biotechnology, University of Jammu, Jammu sponsored by Department of Biotechnology (DBT), GOI, 2nd Feb., 2012
14. International Congress of Environment Research (ICER-2011) organized by Journal of Environmental Research and Development (JERAD), Gujarat Pollution Control Board & SVNIT, Surat, Gujarat from 15th - 17th Dec., 2011
15. National Conference on Medicinal Orchids: Sustainable use and Benefit sharing for Rural and Tribal Communities organized by The Orchid Society Of India (TOSI), Department of Botany, Panjab University, Chandigarh from 28th - 29th March, 2011
16. International Conference on Mitochondrial Research & Medicine (ICMRM 2010) organized by School of Biotechnology, Shri Mata Vaishno Devi University, Katra from 12th -13th Nov., 2010
17. 3rd North Zone Students Research Convention (ANVESHAN-2010) organized by Association of Indian Universities, New Delhi and University of Jammu, Jammu from 4th -5th June, 2010
18. Workshop on Trends in Bioinformatics organized by University of Jammu, Jammu & SMVDU, Katra from 16th - 19th March, 2009
19. IV International Symposium on acclimatization and Establishment of Micropropagated Plants, (ISHS) organized by In Vitro International (P) Ltd., Bangalore, Karnataka from 9th - 12th Dec., 2008
20. UGC Sponsored National Seminar on Trends in Modern Biosciences and Integrated workshop on Techniques in Tissue Culture organized by Department of Botany, Biotechnology and Bioinformatics, Hans Raj Mahila Maha Vidyalyaya, Jalandhar from 29th -30th Sept., 2008

21.National Symposium on Plant Biotechnology for Conservation, Characterization, Crop Improvement organized by Dept. of Biotechnology, MS University, Udaipur, Rajasthan from 8th -10th Feb., 2008

22.Workshop on Intellectual Property Rights and Biotechnology DBT and Bioinformatics Centre, Barkatullah University, Bhopal, IPR Management Centre, MPCST Bhopal and NRDC, New Delhi from 12th-13th Feb.,2004