

ISRAR UD DIN, PhD

Associate Professor (Tenured)

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PROFILE HIGHLIGHTS

- **Gold Medal** for 1st position in MSc Botany, awarded by the Department of Botany, Islamia College Peshawar (2006–2007)
- **HEC Indigenous Faculty Development Scholarship** awarded for PhD studies at the University of Milan, Italy
- **Young Scientist Travel Grant** awarded by the International Symposium on Rice Functional Genomics (ISRFG-2016), Montpellier, France (2016)
- Member, Board of Study, IBGE, The University of Agriculture Peshawar
- Member, Academic Council (2021–24), The University of Agriculture Peshawar
- Member, Graduate Study Committee (GSC), Department of Botany, Islamia College Peshawar
- Additional Director, Advanced Studies and Research, The University of Agriculture Peshawar.
- Additional Chief Proctor, The University of Agriculture Peshawar.

EDUCATION

- ❖ **PhD in Biological and Molecular Sciences** | University of Milan, Italy | June 2013 – July 2017
Research Area: Plant Developmental Biology and Functional Genomics
Thesis: Identification and functional characterization of genes controlling reproductive meristem development in Rice (*Oryza sativa* L.). Supervisor: Prof. Martin M. Kater
Worked in the Molecular Biology Laboratory on Arabidopsis and Rice and optimized protocol for laser microdissection-coupled transcriptomics. Got intensive hands-on experience in advanced molecular techniques like Genotyping by PCR and Sequencing, RT PCR, *In situ* Hybridization, Cloning and Agrobacterium-mediated transformation, CRISPR/Cas9 genome editing.
- ❖ **MPhil (Biotechnology)** | The University of Agriculture Peshawar | 2007–2009 | CGPA 3.92/4.00
- ❖ **MSc Botany** | University of Peshawar | 2006–2007 | 1st Position (Gold Medal)
- ❖ **Bachelor of Education (B.Ed)** | University of Peshawar | 2007–2008 | 1st Division
- ❖ **Bachelor of Science (BSc)** | University of Peshawar | 2003–2005 | 1st Division
- ❖ **Intermediate (FSC Pre-medical)** | BISE Peshawar | 2001–2003 | 1st Division
- ❖ **Secondary School Certificate** | BISE SWAT | 2001 | 1st Division

PROFESSIONAL EXPERIENCE

Associate Professor (Tenured) | The University of Agriculture Peshawar | November 2025 – Present

- Independently lead and coordinate research activities across multiple active projects in plant molecular biology, functional genomics, and crop biotechnology, sustaining a pipeline of MS and PhD student supervision.
- Deliver advanced doctoral and postgraduate coursework in Advanced Molecular Biology (IBGE722), Plant Genetic Engineering (IBGE723), and Plant Tissue Culture (IBGE703, 705), integrating hands-on laboratory training with conceptual instruction.
- Maintain authoritative leadership of the Molecular Biology Laboratory, overseeing protocols for genetic transformation, CRISPR editing, genotyping, and gene expression profiling.
- Contribute to institutional governance as Member, Board of Study; Member, Academic Council; and Member, Graduate Study Committee (GSC), shaping curriculum, research policy, and academic standards.
- Independently author and co-author peer-reviewed manuscripts and book chapters, communicating complex research findings to diverse scientific audiences.

Assistant Professor (TTS) | The University of Agriculture Peshawar | Jan. 2018 – Nov. 2025

- Independently supervised MPhil research scholars from thesis design through defense, and co-supervised PhD students, guiding experimental design, data interpretation, and scientific writing.
- Taught and assessed Molecular Biology, Plant Genetic Engineering, Plant Tissue Culture, Principles of Genetics, and Cell & Tissue Culture at BSc (Hons), MPhil, and PhD levels, across 20+ course offerings.
- Served as Organizer and Invited Resource Person for national and international hands-on training workshops, demonstrating strong oral communication and the ability to convey complex molecular techniques to diverse audiences.
- Member, Board of Study; Member, Academic Council (2021–24); Member, Graduate Study Committee (GSC), actively contributing to institutional curriculum and policy development.

Lecturer in Biotechnology | The University of Agriculture Peshawar | July 2017 – January 2018

- Delivered undergraduate instruction in core biotechnology and plant science modules; co-supervised MPhil scholars and guided laboratory research activities.
- Organized scientific events and coordinated student engagement in research dissemination activities.

Lecturer in Botany | Higher Education Department KPK, Pakistan | April 2010 – June 2013

- Taught a wide range of Botany courses including Genetics, Plant Taxonomy, Plant Physiology, Mycology, Phycology, and Ecology to intermediate and undergraduate classes.

COURSES TAUGHT

Assessed through assignments, presentations, and written examinations.

Level	Code	Course Title	Times Taught
PhD	IBGE722	Advanced Molecular Biology	1
	IBGE723	Plant Genetic Engineering	1
MPhil	IBGE703	Plant Tissue Culture	4
	IBGE705	Tissue Culture Lab-I	4
BSc (Hons)	IBGE302	Plant Tissue Culture	3
	IBGE303	Plant Diversity	2
	IBGE307	Cell and Tissue Culture	1
	IBGE312	Principles of Genetics	1
	IBGE415	Molecular Biology	2

RESEARCH & EXPERIMENTAL TECHNIQUES

Plant Transformation & Genetics

- **Agrobacterium-mediated genetic transformation of plants**
- **Genome Editing (CRISPR/Cas9)** for functional characterization of genes
- *E. coli* and *Agrobacterium* electro-competent cell preparation
- Restriction digestion, gene cloning, and Colony PCR
- Genotyping of mutant lines carrying T-DNA insertions or indel mutations

Plant Systems & Model Organisms

- **Arabidopsis thaliana**: inflorescence meristem development and functional genomics
- **Rice (*Oryza sativa*)**: reproductive meristem gene expression, diversity, and stress response
- Wheat (*Triticum aestivum*): yield performance, stripe rust resistance, proteomics
- Soybean: flooding stress proteomics; Tea plant: soil microbiome and polyphenol studies

Molecular & Cellular Biology

- DNA and RNA extraction, purification from agarose gels; cDNA synthesis
- Gene expression profiling via *In-situ* hybridization (ISH) and Real-Time PCR
- Laser Microdissection (LMD), RNA extraction, and NGS library preparation
- Tissue embedding in paraplast, microtome sectioning, and microscopic slide preparation
- Plant phenotyping under short- and long-day photoperiod conditions
- Hydroponic culture and in vitro Plant Tissue Culture establishment

Bioinformatics & Computational Tools

- Database mining: TAIR, NCBI, RAP-DB, Ensembl, Phytozome, Rice Diversity
 - Multiple sequence alignment (ClustalW2, Clustal Omega) and phylogenetic analysis (MEGA)
 - gRNA design using CRISPR-P v2.0; BLAST, Primer3, Phytozome
 - Statistical analysis and data visualization: SPSS, GraphPad Prism, ImageJ, Photoshop
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INTERNATIONAL COLLABORATIONS & COMMUNICATION

- **Italy (University of Milan):** Long-term research collaboration with Prof. Martin M. Kater's laboratory (Plant Developmental Biology); co-authored two publications in *The Plant Journal*, demonstrating sustained written and scientific communication at the highest international standard.
 - **France (IRD, Montpellier):** Collaborative project on rice inflorescence transcriptomics with Dr. Thomas W.R. Harrop; presented findings at the 14th International Symposium on Rice Functional Genomics (ISRFG-2016), awarded a **Young Scientist Travel Grant**.
 - **Spain (Aguablava):** Poster presentation at the International Workshop on Molecular Control of Flower Development (2015), broadening scientific network across European plant science communities.
 - **Oral Presentations:** Exposeed Meeting, CREA, Italy (2016); 5th PhD School Workshop, University of Milan, Italy (2016); demonstrating strong oral scientific communication skills on the international stage.
 - **Invited Resource Person** and Workshop Organizer: Two-days Hands-on Training Workshop on Plant Tissue Culture Techniques (IBGE, April 2019) and multiple national workshops, demonstrating ability to communicate advanced molecular methodologies to diverse technical and non-technical audiences.
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CONFERENCES, WORKSHOPS & MEETINGS

- 1st International Conference on Genomics and Genome Editing in Agriculture, Biology and Biomedicine (GEABM), Hazara University, Mansehra, Pakistan – June 2025
- 5th International Conference on Advances in Biosciences, University of Swat – May 2022
- Two-day Training Workshop: Genetic and Genomic Approaches for Wheat Production Enhancement, Hazara University Mansehra – March 2022
- 4th International Symposium on Advances in Molecular Biology of Plants & Health Sciences, CEMB Lahore – December 2021
- Two-day Hands-on Training Workshop: Industrial Biotechnology and Plant Tissue Culture, IBGE Peshawar – December 2021
- National Workshop: Beneficial Microbes & Sustainable Crop Production, University of Agriculture Peshawar – February 2020
- Training Course: Classical and Molecular Approaches in Wheat Breeding, University of Agriculture Peshawar – January 2019
- **Organizer & Resource Person:** Two-day Hands-on Training Workshop on Plant Tissue Culture Techniques, IBGE Peshawar – April 2019
- Third National Conference on Emerging Trends in Bioinformatics and Biosciences, Hazara University Mansehra – October 2019
- International Conference: Strategies for Ensuring Food Security in the Changing Climate, University of Agriculture Peshawar – October 2019
- 7th International & 16th National Conference: Plant Resources – Current Trends, Challenges and Solutions, Islamia College University Peshawar – March 2018

- **Oral Presentation:** Exposeed Meeting, CREA, Italy – June 2016. Functional Characterization of Genes Putatively Controlling Inflorescence Development in Arabidopsis and Rice.
- **Oral Presentation:** 5th PhD School Workshop, University of Milan, Italy – June 2016. Gene expression profiling of reproductive meristem types in early rice inflorescences by laser microdissection.
- **Poster Presentation (Young Scientist Travel Grant):** 14th International Symposium on Rice Functional Genomics (ISRFG-2016), Montpellier, France – September 2016. Functional Characterization of Genes Putatively Controlling Inflorescence Development in Arabidopsis and Rice.
- **Poster Presentation:** International Workshop on Molecular Control of Flower Development, Aiguablava, Spain – 2015. Whole-genome expression analysis in early developmental stages of the rice panicle.

PUBLICATIONS

1. Ahmad, A., Ibrahim, M., Yaqoob, M., Fahim, M., Khan, SH., **Ud Din, I.**, Khan M, Ahmad, S. (2026). Genome sequencing reveals genes under selection for olfactory transduction in highland sheep. *Mol Genet Genomics* **301**, 155. <https://doi.org/10.1007/s00438-026-02477-1>
2. Shakeel, Z., Khan, M., **Ud Din, I.** et al. (2026). *Characterization of drought tolerance traits in Ahl15gr inducible transgenic Nicotiana tabacum L. (Solanaceae)*. 3 Biotech. <https://doi.org/10.1007/s13205-026-04985-8>
3. Khan, F., Khan, M., **Ud Din, I.** et al. (2026). Influence of Bacillus subtilis Bioinoculant Application Methods on Growth, Yield Traits, and Biochemical Contents of Wheat (Triticum aestivum L.) Cultivars. *Romanian Agricultural Research* (Accepted).
4. Shahzad, Z., Ullah, I., Khan, F.U., **Ud Din, I.** (2025). Evaluation of advanced bread wheat lines for yield performance and resistance to stripe rust. *Plant Protection*. <https://doi.org/10.33804/pp.009.02.5590>
5. Mujtaba, H., Khan, F.U., Sufyan, M., **Ud Din, I.** et al. (2025). Utilizing genetic resources to develop yellow rust-resistant and high-yielding wheat genotypes across diverse environments. *Genetic Resources & Crop Evolution*. <https://doi.org/10.1007/s10722-025-02374-3>
6. Khan, S., Ali, N., Khan, F.U., **Ud Din, I.**, Amjad, M., & Ahmad, I. (2025). Genetic diversity in wheat landraces for agronomic traits and yellow rust resistance. *Genetic Resources & Crop Evolution*. <https://doi.org/10.1007/s10722-024-02308-5>
7. Arafat, Y., Shah, A., **Ud Din, I.** et al. (2024). Root interactions in wheat/fababean intercropping system enhanced growth performance and yield. *Rhizosphere*. <https://doi.org/10.1016/j.rhisph.2024.101007>
8. Shah SN, Ercisli S, Zaman A, **Ud Din I**, Khan FU et al. (2024). SEM and LM insights: Spore morphology and its taxonomic significance in Sino Himalayan, Malesian, and European elements of Pteridaceae. *Microscopy Research & Techniques* (IF: 2.5). <https://doi.org/10.1002/jemt.24583>
9. Beretta VM, Franchini E, **Ud Din I** et al. (2023). The ALOG family members OsG1L1 and OsG1L2 regulate inflorescence branching in rice. *The Plant Journal* (IF: 7.091). <https://doi.org/10.1111/tpj.16229>
10. **Ud Din I**, Khan S, Khan FU, Khan M, Khan MN et al. (2023). Genetic Characterization of Advance Bread Wheat Lines for Yield and Stripe Rust Resistance. *ACS Omega* (IF: 3.7). <https://doi.org/10.1021/acsomega.3c01981>
11. Tahir, O.; Bangash, S.A.K.; Ibrahim, M.; Shahab, S.; Khattak, S.H.; **Ud Din, I.**; Khan, M.N. et al. (2023). Evaluation of Agronomic Performance and Genetic Diversity Analysis Using Simple

- Sequence Repeats Markers in Selected Wheat Lines. *Sustainability*, 15, 293 (IF: 3.25). <https://doi.org/10.3390/su15010293>
12. Fazal, U., **Ud Din, I.**, Khan, AM., et al. (2022). Evaluation of agro-morphological traits, seed characterization and genetic diversity of local rice (*Oryza sativa* L.) varieties of Pakistan. *Genetic Resources and Crop Evolution* (IF: 1.52). <https://doi.org/10.1007/s10722-022-01478-4>
 13. Ibrahim M, Ahmad S, **Ud Din I**, Ahmad W, et al. (2022). Microsatellite analysis revealed potential DNA markers for gestation length in Kari sheep. *Animals* 12(23), 3292 (IF: 3.23). <https://doi.org/10.3390/ani12233292>
 14. Ullah S, Khan MN, Lodhi SS, Ahmed I, Tayyab M, Mehmood T, **Ud Din I**, Khan M, Sohail Q and Akram M (2022). Targeted metabolomics reveals fatty acid abundance adjustments as playing a crucial role in drought-stress response and post-drought recovery in wheat. *Frontiers in Genetics* 13:972696 (IF: 4.77). <https://doi.org/10.3389/fgene.2022.972696>
 15. S. Bibi, S. Ullah, A. Hafeez, M.N. Khan, M.A. Javed, B. Ali, **Ud Din I**, S.A.K. Bangash et al. (2022). Exogenous Ca/Mg quotient reduces the inhibitory effects of PEG induced osmotic stress on *Avena sativa* L. *Brazilian Journal of Biology* 84-2024 (IF: 1.65). <https://doi.org/10.1590/1519-6984.264642>
 16. Khan MN, Ahmad I, **Ud Din I** et al. (2022). Proteomic insight into soybean response to flooding stress reveals changes in basic energy metabolism and cell wall modifications. *PLOS ONE* 17(5): e0264453 (IF: 3.75). <https://doi.org/10.1371/journal.pone.0264453>
 17. Mehmood, S., **Ud Din, I.**, Ullah, I. et al. (2021). Agro-morphological and genetic diversity studies in Rice (*Oryza sativa* L.) germplasm using microsatellite markers. *Molecular Biology Reports* (IF: 2.3). <https://doi.org/10.1007/s11033-021-06710-5>
 18. Amjad SF, Mansoor N, **Ud Din I**, Khalid Iqbal R et al. (2021). Application of Zinc Fertilizer and Mycorrhizal Inoculation on Physio-Biochemical Parameters of Wheat under Water-Stressed Environment. *Sustainability* 13(19):11007 (IF: 3.25). <https://doi.org/10.3390/su131911007>
 19. Jun Chen, Zhou L, **Ud Din I**, Arafat Y et al. (2021). Antagonistic Activity of *Trichoderma* spp. Against *Fusarium oxysporum* in Rhizosphere of *Radix pseudostellariae* Triggers Host Defense Genes and Improves Growth Under Long-Term Monoculture. *Frontiers in Microbiology* (IF: 4.07). DOI:10.3389/fmicb.2021.579920
 20. Arafat Y, **Ud Din I**, Tayyab M, Hang JU, Chen T et al. (2020). Soil-sickness in aged tea plantation is associated with a shift in microbial communities as a result of plant polyphenol accumulation. *Frontiers in Plant Science*, 11: 601 (IF: 5.7). <https://doi.org/10.3389/fpls.2020.00601>
 21. Jun Chen J., Arafat Y, **Ud Din I**, Yang B, Zhou L et al. (2019). Nitrogen Fertilizer Amendment Alter the Bacterial Community Structure in the Rhizosphere of Rice (*Oryza sativa* L.) and Improve Crop Yield. *Frontiers in Microbiology* 10:2623 (IF: 4.07). doi:10.3389/fmicb.2019.02623
 22. Khan AM, Uddin R, Rehman ZU, **Ud Din I**, Muhammad A, Ali Q et al. (2019). Genetic variability and heritability for yield and yield associated traits among *Brassica napus* genotypes. *Int. J. Biosciences* 14(4), 369–377.
 23. Harrop TW, **Ud Din I**, Gregis V, Osnato M, Jouannic S, Adam H, Kater MM. (2016). Gene expression profiling of reproductive meristem types in early rice inflorescences by laser microdissection. *The Plant Journal* 86(1):75–88 (IF: 6.17). doi:10.1111/tj.13147
 24. Shah AH, Shah SH, Ahmad H, Baig A, Swati ZA, Aiman U, **Ud Din I**, Khalid Q, and Shah AH. (2011). Co adaptation of LiCl tolerant *Solanum tuberosum* L. callus cultures to NaCl stress. *African Journal of Biotechnology* 10(62):13444–52.

Book Chapters

1. Khan, F.U., Abbas, F., Ali, H., **Ud Din I.**, Rehman, A.U., & Phillips, M. (2025). Biotechnology and Genomics for Developing Climate-Resilient Crops in the Gulf Region. In *World Sustainability Series* (pp. 577–589). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-032-00098-9_46
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REFERENCES

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