

Curriculum Vitae

RUBAB ZAHRA NAQVI



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Objective

To work as a creative and knowledgeable resource in the field of Plant Molecular Biology, Biotechnology and Genomics with a focus on projects for the betterment of agriculture in Pakistan.

Education			
<ul style="list-style-type: none"> PhD Biotechnology CGPA: 4.00 (1st division) Specialization: Plant Molecular Biology, Genomics and Bioinformatics 	<ul style="list-style-type: none"> National Institute for Biotechnology and Genetic Engineering (NIBGE)/ Pakistan Institute for Engineering and Applied Science (PIEAS) 2014 – 2018 Thesis Title: Next Generation Sequencing Based Identification and Characterization of Important Genes in Cotton 	<ul style="list-style-type: none"> Faisalabad/ Islamabad 	
<ul style="list-style-type: none"> MPhil Biotechnology CGPA: 3.96 (1st division) Specialization: Plant Molecular Biology, Genomics and Bioinformatics 	<ul style="list-style-type: none"> National Institute for Biotechnology and Genetic Engineering (NIBGE)/ Pakistan Institute for Engineering and Applied Science (PIEAS) 2009 – 2011 Thesis Title: Isolation and evaluation of some dicot promoters 	<ul style="list-style-type: none"> Faisalabad/ Islamabad 	
<ul style="list-style-type: none"> BS. (Hons.) Bioinformatics CGPA: 3.43 (1st division) 	<ul style="list-style-type: none"> Govt. College University Faisalabad. 2004 – 2008 	<ul style="list-style-type: none"> Faisalabad 	
<ul style="list-style-type: none"> Intermediate Pre-medical (1st division) 793/1100 (72% marks) 	<ul style="list-style-type: none"> Govt. College for Women, Madina Town 2002 – 2004 	<ul style="list-style-type: none"> Faisalabad 	
<ul style="list-style-type: none"> Matriculation Science Group (1st division) 700/850 (82% marks) 	<ul style="list-style-type: none"> Govt. Girls Higher Secondary School, Chak Jhumra 2000 – 2002 	<ul style="list-style-type: none"> Faisalabad 	

Awards

- Best Research Paper Award (August 2019) from Higher Education Commission of Pakistan** for Naqvi, Rubab Zahra, et al. "Transcriptomics reveals multiple resistance mechanisms against cotton leaf curl disease in a naturally immune cotton species, *Gossypium arboreum*." *Scientific reports* 7.1 (2017): 15880.

Fellowship

- Norman E. Borlaug Fellowship
- United States Department of Agriculture (Sequencing and Assembling a Draft Genome of *Kokia drynarioides*, a *Gossypium* Outgroup) May 2015 – Aug 2015
- Mississippi State University USA

- HEC-International Research Support Initiative Program (IRSIP)
- Plant Bioinformatics and data analysis
October 2016-April 2017
- Cornell University
USA

Work Experience			
	July 2022-present	Molecular Virology and Gene Silencing Lab, ABD, National Institute for Biotechnology and Genetic Engineering (NIBGE)	job title: Senior Scientist
	December 2020-December 2021	Gene Isolation Lab, ABD, NIBGE SRGP: Transcriptome-wide gene expression analysis of cotton under whitefly-mediated Cotton Leaf Curl Disease (CLCuD) 1 million	job title: HEC IPFP Fellow
	August 2018-December 2020	GMO Testing, Generated Income Project at ABD, National Institute for Biotechnology and Genetic Engineering (NIBGE)	job title: DPL Skilled
	May 2012-2017	Pak-US ICARDA Cotton Productivity Enhancement Project at ABD, NIBGE <ul style="list-style-type: none"> ▪ Major tasks (Gene isolation, cloning, tobacco and cotton transformation, Bioinformatics data analysis) ▪ Gene Isolation Lab, Agricultural Biotechnology Division, NIBGE ▪ Major job functions <ul style="list-style-type: none"> ▪ Learned different techniques used in molecular biology ▪ Hands on experience on different bioinformatics tools ▪ Understood different laboratory Standard Operating Procedures 	job title: Researcher
	Jan – Dec 2008		job title: INTERNEE

Research Articles	
	1. Ehsan, A.; Naqvi, R.Z. ; Azhar, M.; Awan, M.J.A.; Amin, I.; Mansoor, S.; Asif, M. Genome-Wide Analysis of WRKY Gene Family and Negative Regulation of GhWRKY25 and GhWRKY33 Reveal Their Role in Whitefly and Drought Stress Tolerance in Cotton. <i>Genes</i> 2023, 14, 171.
	2. Farooq, M.; Naqvi, R.Z. ; Amin, I.; Rehman, A.U.; Asif, M.; Mansoor, S. Transcriptome diversity assessment of <i>Gossypium arboreum</i> (FDH228) leaves under control, drought and whitefly infestation using PacBio long reads. <i>Gene</i> 2023, 852, 147065.
	3. Naqvi, R.Z. ; Siddiqui, H.A.; Mahmood, M.A.; Najeebullah, S.; Ehsan, A.; Azhar, M.; Farooq, M.; Amin, I.; Asad, S.; Mukhtar, Z. Smart breeding approaches in post-genomics era for developing climate-resilient food crops. <i>Frontiers in Plant Science</i> 2022, 13.
	4. Siddiqui, H.A.; Asad, S.; Naqvi, R.Z. ; Asif, M.; Liu, C.; Liu, X.; Farooq, M.; Abro, S.; Rizwan, M.; Arshad, M. Development and evaluation of triple gene transgenic cotton lines expressing three genes (Cry1Ac-Cry2Ab-EPSPS) for lepidopteran insect pests and herbicide tolerance. <i>Scientific Reports</i> 2022, 12, 18422.
	5. Mahmood, M.A.; Naqvi, R.Z. ; Mansoor, S. Engineering crop resistance by manipulating disease susceptibility genes. <i>Molecular Plant</i> 2022, 15, 1511
	6. Hussain A, Farooq M, Naqvi RZ , Aslam MQ, Siddiqui HA, Amin I, Liu C, Liu X, Scheffler J, Asif M, Mansoor S. Whole-Genome Resequencing Deciphers New Insight into Genetic Diversity and Signatures of Resistance in Cultivated Cotton <i>Gossypium hirsutum</i> . <i>Molecular Biotechnology</i> . 2022 Jul 1:1-8.

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7. Aslam MQ, **Naqvi RZ**, Zaidi SS, Asif M, Akhter KP, Scheffler BE, Scheffler JA, Liu SS, Amin I, Mansoor S. Analysis of a tetraploid cotton line Mac7 transcriptome reveals mechanisms underlying resistance against the whitefly *Bemisia tabaci*. *Gene*. 2022 Apr 30;820:146200.
 8. Mahmood MA, **Naqvi RZ**, Siddiqui HA, Amin I, Mansoor S. Current knowledge and implementations of *Bemisia tabaci* genomic technologies for sustainable control. *Journal of Pest Science*. 2022 Jun 16:1-4.
 9. Asif M, Siddiqui HA, **Naqvi RZ**, Amin I, Asad S, Mukhtar Z, Bashir A, Mansoor S. Development of event-specific detection method for identification of insect resistant NIBGE-1601 cotton harboring double gene Cry1Ac-Cry2Ab construct. *Scientific reports*. 2021 Feb 10;11(1):1-9.
 10. Umer N, **Naqvi RZ**, Rauf I, Anjum N, Keen PR, Van Eck J, Jander G, Asif M. Expression of *Pinellia ternata* leaf agglutinin under rolC promoter confers resistance against a phytophagous sap sucking aphid, *Myzus persicae*. *Electronic Journal of Biotechnology*. 2020 Sep 1;47:72-82.
 11. Hussain A, Farooq M, **Naqvi RZ**, Amin I, Pervaiz K, Saeed M, Asif M, Mukhtar MS, Mansoor S. Genome-wide identification and classification of resistance genes predicted several decoy domains in *Gossypium* sp. *Plant Gene*. 2020 Dec 1;24:100250.
 12. Mubeen H, **Naqvi RZ**, Masood A, Saleem MA, Bashir A, Raza S. Isolation, Cloning and Characterization of a Constitutive Plant from *Potato Aquaporin* Gene. *Biological Sciences-PJSIR*. 2020 Nov 13;63(3):169-78.
 13. Zaidi, SSA., **Naqvi, RZ.**, Asif, M., Strickler, S., Shakir, S., Shafiq, M., Khan, A., Amin, I., Mishra, B., Mukhtar, S., Scheffler, B., Scheffler, J., Mueller, L., Mansoor, S. Molecular insight into cotton leaf curl geminivirus disease resistance in cultivated cotton (*Gossypium hirsutum*). *Plant biotechnology journal*. 2020 Mar;18(3):691-706.
 14. Siddiqui, HA., Asif, M., Asad, S., **Naqvi, RZ.**, Ajaz, S., Umer, N., Anjum, N., Rauf, I., Sarwar, M., Arshad, M., Amin, I., Saeed, M., Mukhtar, Z., Bashir, A., & Mansoor., S. Development and evaluation of double gene transgenic cotton lines expressing Cry toxins for protection against chewing insect pests. *Scientific Reports* volume 9, Article number: 11774 (2019).
 15. Rauf I, Asif M, Amin I, **Naqvi RZ**, Umer N, Mansoor S, Jander G. Silencing cathepsin L expression reduces *Myzus persicae* protein content and the nutritional value as prey for *Coccinella septempunctata*. *Insect molecular biology*. 2019 Dec;28(6):785-97.
 16. Rauf, I., Javaid, S., **Naqvi, RZ.**, Mustafa, T., Amin, I., Mukhtar, Z., Jander, G. and Mansoor, S., 2019. In-planta expression of insecticidal proteins provides protection against lepidopteran insects. *Scientific reports*, 9(1), p.6745.
 17. **Naqvi RZ**, Zaidi SS, Mukhtar MS, Amin I, Mishra B, Strickler S, Mueller LA, Asif M, Mansoor S. Transcriptomic analysis of cultivated cotton *Gossypium hirsutum* provides insights into host responses upon whitefly-mediated transmission of cotton leaf curl disease. *Plos One*. 2019 Feb 7;14(2):e0210011.
 18. **Naqvi RZ**, Zaidi SS, Akhter KP, Strickler S, Woldemariam M, Mishra B, Mukhtar MS, Scheffler BE, Scheffler JA, Jander G, Mueller LA, Asif M, and Mansoor S. Transcriptomics reveals multiple resistance mechanisms against cotton leaf curl disease in a naturally immune cotton species, *Gossypium arboreum*. *Scientific reports*. 2017, 21;7(1):15880.
 19. **Naqvi RZ.**, Asif, M., Saeed, M., Asad, S., Khatoon, A., Amin, I., Mukhtar, Z. Bashir, A. Mansoor, S. Development of a Triple Gene Cry1Ac-Cry2Ab-EPSPS Construct and Its Expression in *Nicotiana benthamiana* for Insect Resistance and Herbicide Tolerance in Plants. *Frontiers in Plant Science* 2017, 8, 55.
 20. **Naqvi RZ**, Mubeen H, Masood A, Khatoon A, Bashir A. Identification, isolation and evaluation of a constitutive sucrose phosphate synthase gene promoter from tomato. *Pakistan Journal of Botany*. 2017, 1;49(3):1105-12.
 21. Grover CE, Arick MA, Conover JL, Thrash A, Hu G, Sanders WS, Hsu CY, **Naqvi RZ**, Farooq M, Li X, Gong L. Comparative genomics of an unusual biogeographic disjunction in the cotton tribe
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	<p>(Gossypieae) yields insights into genome downsizing. <i>Genome biology and evolution</i>. 2017, 27;9(12):3328-44.</p> <p>22. Iqbal N, Asif M, Masood A, Naqvi RZ, Khatoon A, Bashir A. Isolation and characterization of sucrose phosphate synthase promoter from cotton ('<i>Gossypium hirsutum</i>'L.). <i>Australian Journal of Crop Science</i>. 2017, 11(6):668.</p> <p>23. Mubeen H., Naqvi RZ., Masood M., Shoaib MW., and Raza S. Gene transformation: Methods, Uses and Applications. <i>J. Pharm. Biol. Sci.</i> 2016; 4(2).</p> <p>24. Masood M., Iqbal N., Naqvi RZ., and Mubeen H. <i>In silico</i> comparative genomic analysis of Escherichia coli E24377A and Escherichia coli HS. <i>International Journal of Medical and Health Research</i>. 2016; 2(3), pp 03-10.</p> <p>25. Naqvi RZ., Mubeen, H., & Raza, S. Role of plant promoters and their cis regulatory elements in gene expression regulation. <i>ejpmr</i>, 2016,3(1), 347-352</p> <p>26. Masood, A., Iqbal, N., Mubeen, H., Naqvi RZ., Khatoon, A., & Bashir, A. Cloning and expression analysis of alcohol dehydrogenase (Adh) hybrid promoter isolated from Zea mays. <i>African Journal of Biotechnology</i>, 2016, 15(42), 2384-2393.</p> <p>27. Nawaz M., Rana SM., Naqvi RZ., Abbas Q., Naveed R., and Khan AG. Molecular phylogeny and Recombination among the CP (Coat Protein) genes associated with begomoviruses, <i>J. Nat. Sci.</i> 2009, 7(1-2), pp 5-11.</p>
Book Chapter	<p>1. Naqvi, R.Z.; Farooq, M.; Naqvi, S.A.A.; Siddiqui, H.A.; Amin, I.; Asif, M.; Mansoor, S. Big data analytics and advanced technologies for sustainable agriculture. Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0 2020, 1-27</p> <p>2. Naqvi, S.A.A.; Naqvi, R.Z. Geographical Information Systems (GIS) in Industry 4.0: Revolution for Sustainable Development. In Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0; Springer: 2021; pp. 1-27.</p> <p>3. Basavaprabhu L. Patil, Supriya Chakraborty, Henryk Czosnek, Elvira Fiallo-Olivé, Robert L. Gilbertson, James Legg, Shahid Mansoor, Jesús Navas-Castillo, Rubab Z. Naqvi, Saleem U. Rahman, Francisco M. Zerbini. Plant Resistance to Geminiviruses, Reference Module in Life Sciences, Elsevier, 2020, ISBN 9780128096338, https://doi.org/10.1016/B978-0-12-809633-8.21565-3.</p>
Patents	<p>1. Shahid Mansoor, Rubab Zahra Naqvi, Muhammad Asif, Muhammad Saeed, Asia Khatoon, Imran Amin, Muhammad Arshad, ShaheenAsad, Zahid Mukhtar, Aftab Bashir. Development of triple gene Cry1Ac-Cry2Ab-EPSPS construct for insect resistance and herbicide tolerance in plants. Patent filed at IPO Pakistan. (IPO, patent application No. 614/2016)</p> <p>2. Shahid Mansoor, Muhammad Asif, Shaheen Asad, Rubab Zahra Naqvi, Hamid Anees Siddiqui, Imran Amin, Zahid Mukhtar, Aftab Bashir. Method for the detection of transgenic event NIBGE-1601 in insect resistant cotton harboring double gene Cry1Ac-Cry2Ab, Patent filed at IPO Pakistan. (IPO, patent application No. 250/2019)</p>
Training/ Workshop/ Conferences	<ul style="list-style-type: none"> ▪ 1st International Conference on Biotechnology and Informatics. April 10-12, 2006 at BUITMS, Quetta. (Participant) ▪ Hands on Experience in Bioinformatics and Molecular Biology. April 2-May 30, 2008 at NIBGE, Faisalabad. (Participant) ▪ 29th Pakistan congress of Zoology-International. February 24-26, 2009 at University of Sindh, Jamshoro. (Participant) ▪ Advances technologies in gene expression analysis. September 23-27, 2013 at NIBGE, Faisalabad. (Organizer) ▪ ICGI-International Cotton Genome Initiative conference. September 25-28, 2014 at Wuhan, China. (Participant) ▪ Bioinformatics: Ensembl database mining and whole genome sequencing analysis. December 16-18, 2014 at COMSTECH, Islamabad. (Participant) ▪ Applications of Biotechnology for wheat improvement. March 11-12, 2014 at NIBGE, Faisalabad. (Participant)

	<ul style="list-style-type: none"> ▪ The development and testing of transgenics for cotton leaf curl virus (CLCuV) disease resistance, March 18-19, 2014 at CEMB, Lahore. (Participant) ▪ 1st National students' conference on biological sciences. March 27-28, 2014 at NIBGE. (Participant) ▪ Norman E. Borlaug Fellowship. May-August, 2015 at Mississippi State University, USA. ▪ 2nd National students' conference on biological sciences. March 12-14, 2015 at NIBGE. (Organizer) ▪ One day awareness and research symposium on Diabetes, heart disease and related metabolic disorders. 5th November, 2015 at NIBGE, Faisalabad. (Participant) ▪ ICGEB course on basic biotechnology techniques. March 15-17, 2016 at NIBGE, Faisalabad. (Participant) ▪ 1st International conference on advances in Biotechnology. March 30-31, 2016 at AKHUWAT/GC University, Faisalabad. (Participant) ▪ One Day Symposium on Frontiers of Nanotechnology Applications in Pakistan; Present Scenario and Future Avenues. October 24, 2018 at NIBGE, Faisalabad. (Participant) ▪ Hands on training on molecular characterization of whiteflies (Insecta) in Pakistan. November, 30-2018(Participant) ▪ International Workshop on "Use of Genome Editing & other New Breeding Technologies for Global Food Security", April 8-10, 2019, COMSTECH Islamabad, Pakistan, Jointly Organized by COMSTECH, NIBGE & ICGEB (Participant and speaker) ▪ The National Faculty Development Program. June 8-July 4, 2020. National Academy of Higher Education at Higher Education Commission (HEC) Pakistan (Trainee) ▪ The National Faculty Development Program. July 16-October 18, 2020. National Academy of Higher Education at Higher Education Commission (HEC) Pakistan (Assistant Mentor)
Skills	<ul style="list-style-type: none"> ▪ Wet Lab: Plant Molecular biology, Gene Isolation and characterization, Cloning and construct development, Protein expression and purification, Tissue culture and plant transformation, Total RNA isolation and cDNA synthesis, PCR, RT-PCR & qRT-PCR, Quantitative ELISA, Southern blotting, Virus induced Gene Silencing (VIGS), Insect bioassays ▪ Dry Lab: Whole genome sequencing assembly, RNA-Seq/transcriptome and big data analysis, Biotechnology/Bioinformatics packages, NCBI, Swissprot, Justbio, CLC bio, Expasy tools, R, Tophat, Bowtie, Hisat, Cufflinks, Other linux and web based bioinformatics tools ▪ Productivity Software ▪ MS Office, Several other general purpose productivity software ▪ Microsoft Windows Operating System (different versions), Linux (different versions)
Future plans	<ul style="list-style-type: none"> ▪ Pursuing Plant Molecular Biology, Genomics and Biotechnology research work with an aim to make an impact on our society and economy. ▪ Working on advanced Biocomputing tools
Languages	<ul style="list-style-type: none"> ▪ English (Writing, Reading, Speaking), Urdu (Writing, Reading, Speaking), Punjabi (Speaking)
Research Interests	<ul style="list-style-type: none"> ▪ Plant Molecular Biology, Genomics and Bioinformatics, Gene Isolation and characterization
Hobbies	<ul style="list-style-type: none"> ▪ Volunteering, Tourism, Hiking
References	<ul style="list-style-type: none"> ▪ Dr. Muhammad Asif, Principal Scientist, Agricultural Biotechnology Division, National Institute for Biotechnology and Genetic Engineering (NIBGE), PO Box 577, Jhang Road, Faisalabad, Pakistan. ▪ Dr. Imran Amin, Dr. Muhammad Asif, Principal Scientist, Agricultural Biotechnology Division, National Institute for Biotechnology and Genetic Engineering (NIBGE), PO Box 577, Jhang Road, Faisalabad, Pakistan. ▪ Dr. Shahid Mansoor, SI, Senior Advisor, International Center for Chemical and Biological Sciences, University of Karachi, Karachi, Pakistan.