Dr. Samina Iqbal, Deputy Chief Scientist (DCS)

Head, Soil and Environmental Biotechnology Division
Group leader, Biodegradation and Bioremediation Group

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EDUCATION:

PhD. Environmental Biotechnology (1999 - 2003): University of Reading, Reading, UK.

Thesis: Factors affecting regulation of phosphonate metabolism in Gram-negative bacteria.

M.Phil. **Chemistry (1989 – 1991), University of Agriculture, Faisalabad**

M.Sc. Chemistry (1987 – 1989), University of Agriculture, Faisalabad

APPOINTMENTS

March 2018 to onwards: Head, Soil and Environmental Biotechnology Division

Dec. 2016 to onwards: Dy. Chief Scientist, Soil and Environmental Biotechnology Division, NIBGE. R & D on biodegradation, bioremediation/phytoremediation of pesticides and other contaminants.

Dec. 2006 to Dec. 2016: Principal Scientist Environmental Biotechnology Division, NIBGE. R & D on biodegradation, bioremediation/phytoremediation of insecticides, herbicides and other contaminants.

January, 2004 to Dec. 2006: Senior Scientist, Environmental Biotechnology Division, NIBGE. Research work carried out on biodegradation of pesticides.

October 1999 to Dec 2003: PhD studies carried out at the University of Reading, Reading, UK.

Dec. 1997 to October, 1999: Senior Scientific Officer, Environmental Biotechnology Division, NIBGE. Projects carried out were biodegradation of phenol (for treatment of industrial effluents) and biodegradation of petroleum (for treatment of oil contaminated soil).

Set up of Water and waste water analysis lab: Whereby methods were developed for analysis of ware and waste water and commercial activities were started.

Feb. 1993 to Dec. 1997: Scientific Officer, Environmental Biotechnology Division, National Institute for Biotechnology and Genetic Engineering (NIBGE). Projects carried were removal of dyes from industrial effluents and biodegradation of petroleum contaminants.

TRAININGS:

Four months training in the field of "molecular characterization of carbofuran degrading bacterial strain" (July, 2006 to October, 2006) at Oakland University, Rochester MI, USA.

PhD studies (4 years) at the University of Reading, Reading, UK. The research work consisted of regulation of phosphonate metabolism genes in gram-negative bacteria including *Sinorhizobium meliloti* and *E. coli.*

Three months training on detection and enumeration of *E. coli* and genetically engineered microorganisms (GEMs) using polymerase chain reaction (PCR) and subsequent gene probe analysis. July to October 1995. Department of Microbiology, University of Liverpool. UK.

Training workshop on Project formulation, management and monitoring, 26-27 May 2011" in PAEC HQs, Islamabad.

Training on "Management/ Managerial Skills" 12-17 May, 2008 at Establishment division Govt. of Pakistan, Islamabad

AWARDS/HONOURS:

Best Research Paper Award under the programme "HECs Outstanding Research Awards" for a research paper entitled "Enhanced remediation of chlorpyrifos from soil using ryegrass (*Lollium multiflorum*) and chlorpyrifos-degrading bacterium *Bacillus pumilus* C2A1" (IF; 4.43)

Best Research Paper Award under the programme "HECs Outstanding Research Awards" for a research paper entitled "Biodegradation of chlorpyrifos and its hydrolysis product 3, 5, 6-trichloro-2-pyridinol by *Bacillus pumilus* strain C2A1. (IF; 4.30)

PhD scholarship awarded under Islamic Development Bank (IDB) merit scholarship program for 1999-2000.

PUBLICATIONS

- Impact factor (IF): 93.51
- Citations: 1152

1. Ahmad, F., Ashraf, A., Da-Chuan, Yin., Jabeen, H., Anwar, S., Wahla, A.Q., and **Iqbal, S.,** (2019) Application of a novel bacterial consortium BDAM for bioremediation of bispyribac sodium in wheat vegetated soil. Journal of Hazardous Materials, In Press; https://doi.org/10.1016/j.jhazmat.2019.03.130 **(I.F 6.434)**
2. Wahla, A.Q., **Iqbal, S.,** Anwar, S., Firdous, S., Mueller, J., (2019). Optimizing the metribuzin degrading potential of a novel bacterial consortium based on Taguchi design of experiment. Journal of Hazardous Materials. 366: 1-9. **(I.F 6.434)**
3. Tahseen, R., Khalid, Z. M., Afzal, M., **Iqbal, S.,** Arslan, M., and Ahmad, M. S., (2019) Enhanced degradation of hyderocarbons by gamma ray induced mutant strain of *Pseudomonas putida*. Biotechnology letters 41: 391-399 **(I.F 1.846)**
4. Hussain, F., Tahseen, R., Arslan M., **Iqbal, S.,** Afzal, M. (2019). Removal of hexadecane by hydroponic root mats in partnership with alkane-degrading bacteria: bacterial

augmentation enhances system's performance. International Journal of Environmental Science and Technology. In press; https://doi.org/10.1007/s13762-018-2165-1 **(I.F 2.03)**

5. Shahid, M.J., Tahseen, R., Siddique, M., Ali, S., **Iqbal, S.,** Afzal, M., (2018). Remediation of polluted river water by floating treatment wetlands. Water Science and Technology-Water Supply. 19: 967-977 **(I.F 0.674)**
6. Ahmad, F., Anwar, S., Firdous, S., Da-Chuan, Yin., and **Iqbal, S.,** (2018) Biodegradation of bispyribac sodium by a novel bacterial consortium BDAM: Optimization of degradation conditions using response surface methodology. Journal of Hazardous Materials, 349: 272-281 **(I.F 6.434)**
7. Firdous, S., **Iqbal, S.,** Anwar, S. Jabeen, H. (2018). Identification and Analysis of 5-Enolpyruvylshikimate-3-Phosphate Synthase (EPSPS) Gene from Glyphosate Resistant *Ochrobactrum intermedium* Sq20. Pest Management Science. 74: 1184-1196. **(I.F 3.25)**
8. Hussain, Z., Arslan, M., Malik, M, H., Mohsin, M., **Iqbal, S.,** Afzal, M. (2018). Integrated perspectives on the use of bacterial endophytes in horizontal flow constructed wetlands for the treatment of liquid textile effluent: Phytoremediation advances in the field. Journal of Environmental Management. 224: 387-395. **(I.F 4.0).**
9. Hussain, Z., Arslan, M., Malik, M, H., Mohsin, M., **Iqbal, S.,** Afzal, M., (2018). Treatment of the textile industry effluent in a pilot-scale vertical flow constructed wetland system augmented with bacterial endophytes. Science of the Total Environment. 645: 966-973. **(I.F 4.610).**
10. Firdous, S., **Iqbal, S.,** Anwar, S., (2017). Optimization and modeling of glyphosate biodegradation by a novel *Comamonas odontotermitis* P2 through response surface methodology. Pedosphere. https://doi.org/10.1016/S1002-0160 (17)60381-3. **(IF 1.74)**
11. Tahseen, R., Afzal, M., **Iqbal, S.,** Khan. Q.M., Shabir, G., Khalid, Z.M., Banat, I.M., (2016). Rhamnolipids and nutrients boost remediation of crude oil-contaminated soil by enhancing bacterial colonization and metabolic activities. International Biodeterioration & Biodegradation 115, 192-198. **(IF 2.45)**
12. Jabeen, H., **Iqbal, S**., Ahmad, F., Afzal, M., (2016). Enhanced remediation of chlorpyrifos by rye-grass (*Lolium multiflorum*) and a chlorpyrifos degrading bacterium *Mezorhizobium* sp. HN3. International Journal of Phytoremediation. 18, 126-133. **(IF 2.45)**
13. Jabeen, H., **Iqbal, S.,** Anwar, S., Parales, R.E., (2015). Optimization of profenofos degradation by a novel bacterial consortium PBAC using response surface methodology. International Biodeterioration & Biodegradation 100: 89-97. **(IF 2.45)**
14. Jabeen, H., **Iqbal, S**., Anwar, S., (2015). Biodegradation of chlorpyrifos and 3,5,6-trichloro-2-pyridinol by a novel rhizobial strain Mesorhizobiumsp. HN3. Water and Environment Journal. 1: 151-160.
15. Arslan, M., Afzal, M., Amin, I., **Iqbal, S**., Khan, Q.M. , (2014). Nutrients Can Enhance the Abundance and Expression of Alkane Hydroxylase CYP153 Gene in the Rhizosphere of Ryegrass Planted in Hydrocarbon-Polluted Soil. PloS One. https://doi.org/10.1371/journal.pone.0111208 **(I.F 2.766)**

16. Tara, N., Afzal, M., Ansari, T.M., Tahseen, R., **Iqbal, S.**, Khan Q.M., (2014). Combined use of alkane-degrading and plant growth-promoting bacteria enhanced phytoremediation of diesel contaminated soil. International Journal of Phytoremediation. 16: 1268-1277. **(I.F 1.886)**
17. Afzal, M., Shabir, G., **Iqbal, S.,** Mustafa, T., Khan, Q.M., Khalid Z.M., (2014). Assessment of heavy metal contamination in soil and groundwater at leather industrial area of Kasur, Pakistan. Clean Soil Air and Water. 42: 1133-1139. **(I.F 1.338)**
18. Afzal, M., Shabir, G., Tahseen, R., Islam, E., **Iqbal, S.,** Khan, Q.M., Khalid Z.M., (2014). Endophytic *Burkholderia* sp. strain PsJN improves plant growth and phytoremediation of soil irrigated with textile effluent. Clean Soil Air and Water. 42: 1304-1310. **(I.F 1.338)**
19. Afzal, M., Khan, S., **Iqbal, S**., Mirza, M.S., Khan, Q.M., (2013). Inoculation method affects colonization and activity of *Burkholderia phytofirmans* PsJN during phytoremediation of diesel-contaminated soil. International Biodeterioration & Biodegradation. 85: 331-336. **(I.F 3.562)**
20. Khan, S., Afzal, M., **Iqbal, S.,** Miza, M.S., Khan Q.M. (2013). Inoculum pretreatment affects bacterial survival, activity and catabolic gene expression during phytoremediation of diesel contaminated soil. Chemosphere. 91: 663-668. **(I.F 4.427)**
21. Shabir, G., Afzal, M., Tahseen, R., **Iqbal, S.,** Khan, Q.M., Khalid, Z.M., (2013). Detoxification of oil refinery wastewater by pilot scale fed batch reactor followed by coagulation and filtration. American Journal of Environmental Protection. 1: 10-13.
22. Khan, S., Afzal, M., **Iqbal, S.,** Khan, Q.M., (2013). Plant-bacteria partnerships for the remediation of hydrocarbon contaminated soil. Chemosphere 90: 1317-1332. **(I.F 4.427)**
23. Ahmad, F., **Iqbal, S.,** Anwar, S., Afzal, M., Islam, E., Mustafa, T., Khan, Q.M., (2012). Enhanced remediation of chlorpyrifos from soil using ryegrass (*Lollium multiflorum*) and chlorpyrifos-degrading bacterium *Bacillus pumilus* C2A1. J. Hazard. Mater. 237-238: 110-115. **(I.F 6.434)**
24. Anwar, S., Liaquat, F., Khan, Q.M., Khalid, Z.M., **Iqbal, S.,** (2009). Biodegradation of chlorpyrifos and its hydrolysis product 3,5,6-trichloro-2-pyridinol by *Bacillus pumilus* strain C2A1. J. Hazard. Mater. 168: 400-405. **(I.F 6.434)**
25. Fecek, C., Yao, D., Kacorri, A., Vasquez, A., **Iqbal, S.,** Sheikh, H., Svinarich, D.M., P'Oerez-Cruet, M., Chaudhry, G.R., (2008). Chondrogenic derivatives of embryonic stem cells seeded into 3D polycaprolactone scaffolds generated cartilage tissue *in vivo.* Tissue Eng. Part A. 14: 1403-1413. **(I.F 3.508)**
26. Afzal, M**.**, Rauf, S., **Iqbal, S.,** Khalid, Z.M., (2007). Characteristics of phenol biodegradation in saline solutions by monocultures of *Pseudomonas aeruginosa* and *Pseudomonas pseudomallei.* J. Hazard. Mater. 149: 60-66 **(I.F 6.434)**
27. **Iqbal, S**., Parker, G., Davison, H., Rahmani, E.M., Robson, R.L., (2004). Reversible phase variation in the *phnE* gene, which is required for phosphonate metabolism in *Escherichia coli* K-12. J. Bacteriol. 186: 6118-6123. **(I.F 3.219)**
28. **Iqbal, S**., Robinson, J., Deere, D., Saunders, J.R., Edwards, C., and Porter, J., (1997). Efficiency of the polymerase chain amplification of the *udi* gene for detection of *Eschericia coli* in contaminated water. Lett. Appl. Microbiol. 24: 498-502. **(I.F 1.471)**

29. Hussain, I., Khan, Q.M., Khalid, Z.M., Faiz, M., **Iqbal, S.,** Malik, K.A., (1997). Decolorization of aquous dye solutions and textile effluents using industrial waste biomass. In Proceedings of 1st National conference on "Biotechnology for Sustainable Development" Nov. 24-25, Govt. College, Lahore, Pakistan.
30. Khalid, Z.M., **Iqbal**, S., Tabasum, R., Khan, Q.M., Malik, K.A., (1995). Biotechnological Solution to Hazardous Effluents from Textile Industries. In: Biotechnology for Sustainable Development. Eds. Malik K.A., A. Nasim and A.M. Khalid. Proceedings, International Symposium on Biotechnology for Sustainable Development, Faisalabad.
31. Khan, Q.M., Faiz, M., **Iqbal**, S., Khalid, Z.M., Malik, K.A., (1995). Isolation and Characterization of Tn-induced Mutants of Biosurfactant Producing *Pseudomonas* Strains. In: Biotecnology for Sustainable Development. Eds. Malik KA., A. Nasim and AM. Khalid. Proceedings, International Symposium of Biotechnology for Sustainable Development, NIBGE, Faisalabad.
32. **Iqbal, S**., Khalid, Z.M., Malik, K.A., (1995) Enhanced biodegradation and emulsification of crude oil and hyperproduction of biosurfactants by a gamma ray induced mutant of *Pseudomonas aeruginosa*. Lett. Appl. Microbiol. 21:176-179. **(I.F 1.471)**
33. Khan, QM. Faiz, M., **Iqbal**, S., Khalid, Z.M., Malik, K.A., (1994). Hydrocarbon Assimilation and Biosurfactant Production in Tn10 induced mutants of *P. aeruginosa* K3. Proceedings of 2nd International Symposium on Environmental Biotechnology, Brighton,4-6 July UK, P104-106.

PUBLISHED ABSTRACTS:

- **Iqbal, S.,** Anwar, S., (2016). Rhizoremediation of herbicide: A green and sustainable approach. In 16th International Congress of Soil Science on "Healthy Soils for Food Security" March 15-17, 2016, Rawalpindi, Pakistan. Page; 87.
- Anwar, S., **Iqbal, S.,** Firdous, S., Ahmad, F.. (2016). Isolation, identification and physiological characterization of triazophos degrading bacterial strain In 16th International Congress of Soil Science on "Healthy Soils for Food Security" March 15-17, 2016, Rawalpindi, Pakistan. Page;110
- **Iqbal, S.,** Anwar, S., Khan, Q.M., (2013). Biodegradation and Bioremediation of pesticides by microorganisms. in Abstracts "International Conference on Biotechnology, Prospects & Challenges in Agriculture, Industry, Health and Environment" April 22-26, 2013 at NIBGE, Faisalabad
- Jabeen, H., Anwar, S., and **Iqbal, S.,** (2013). Biodegradation of profenofos by a bacterial consortium isolated from profenofos contaminated soil. in Abstracts "International Conference on Biotechnology, Prospects & Challenges in Agriculture, Industry, Health and Environment" April 22-26, 2013 at NIBGE, Faisalabad
- Firdous, S., Anwar, S. and **Iqbal, S.,** (2013). Isolation and characterization of glyphosate resistant bacterial strain and identification of *aroA* gene. in Abstracts "International Conference on Biotechnology, Prospects & Challenges in Agriculture, Industry, Health and Environment" April 22-26, 2013 at NIBGE, Faisalabad
- Anwar, S., **Iqbal, S.,** Ahmad, F., and Khan, Q.M., (2013). Isolation, identification and physiological characterization of triazophos degrading bacterial strain. in Abstracts

"International Conference on Biotechnology, Prospects & Challenges in Agriculture, Industry, Health and Environment" April 22-26, 2013 at NIBGE, Faisalabad

- Anwar, S., Iqbal, S., Ahmad, F., Khan, Q.M., and Khalid, Z.M., (2011). Bioremediation of chlorpyrifos (organophosphate pesticide) by an indigenously isolated bacterial strain *Bacillus pumilus* C2A1 under different culture conditions". in Abstracts 2nd NRCT-IFS Workshops on Research Advances in Natural Products, Food Science and Nutrition. March 14-20, Bangkok, Thailand p 34.
- Fiaz, A., **Iqbal, S.,** Anwar, S., Firdous, S., Jabeen, H. , Liaquat, F. and Khan, Q.M., (2011) "Enhanced remediation of chlorpyrifos from soil by using ryegrass and chlorpyrifos-degrading bacteria " in Abstracts 2nd International Conference of Plant Scientists and 11th National Meeting of Plant Scientists" February 22-24, 2011, GC University, Lahore.
- **Iqbal, S.,** Anwar, S., Khan, Q.M., Khalid, Z.M., (2010). Bioremediation of chlorpyrifos and its primary metabolite 3,5,6-trichloro-2-pyridinol (TCP) by *Bacillus pumilus* C2A1: soil microcosm studies In: Abstracts, "13th Congress of Soil Science, 24-27 March 2010, Faisalabad" p 147.
- Jabeen, H., **Iqbal, S.,** Anwar, S., Khan, Q.M., (2010). Isolation and characterization of a chlorpyrifos degrading bacterial isolate CP3. In Abstracts: 36th All Pakistan International Science Conference on "Utilization of Modern Agriculture Technology in Changing Environment Perspectives. July 21 to 23, 2010, University of AJK, Faculty of Agriculture, Rawalakot. p. 297.
- Firdous, S., **Iqbal, S.,** Anwar, S., Khan, Q.M., (2010). Biodegradation of p-nitrophenol by a novel indigenous isolate PN44. In Abstracts: 36th All Pakistan International Science Conference on "Utilization of Modern Agriculture Technology in Changing Environment Perspectives. July 21 to 23, 2010, University of AJK, Faculty of Agriculture, Rawalakot. p. 306.
- **Iqbal, S.,** Robson, R.L., (2007). Assimilation phosphates and phosphonates in Sinorhizobium meliloti 1021: Involvement of a GntR like regulator. In Abstracts, International symposium on "Microbial technologies for sustainable agriculture: Exploring the hidden potential of microbes. March 12-16, 2007, NIBGE.
- **Iqbal, S.,** Anwar, S., Khalid Z.M., (2007). Biodegradation of organophosphate pesticides: Genes and enzymes involved. In Abstracts, International symposium on "Microbial technologies for sustainable agriculture: Exploring the hidden potential of microbes. March 12-16, 2007, NIBGE.
- **Iqbal, S**., Robson, R.L., (2005). Regulation of phosphonate degradation genes in *Sinorhizobium meliloti* 1021. In Abstracts, 8th biennial conference of Pakistan Society for Biochemistry and Molecular Biology on Emerging Trends in Biochemistry and Molecular Biology, 07-09 March 2005, University of Karachi, Karachi. P 25.
- **Iqbal, S**., Robson, R.L., (2003). Regulation of phosphonate degradation genes in *Sinorhizobium meliloti* 1021. In Abstracts, 153rd meeting of the Society for General Microbiology, 8-11 September 2003, UMIST, Manchester, UK. P 63.
- **Iqbal, S**., Hannachi, N., Robson, R.L., (2003). Evidence for phase variation in the *phnE* gene for phosphonate transport in *Escherchia coli* K-12. In Abstracts, 153rd meeting of the Society for General Microbiology, 8-11 September 2003, UMIST, Manchester, UK. P65.
- Khan, Q.M., Khalid, Z.M., **Iqbal**, S., Faiz, M., Rashid, F., Malik, K.A., (1996).

Biotechnology a solution to environmental problems. Abstracts: First Biotechnology Symposium, Univ of Agri. Faisalabad. June 27.

- **Iqbal, S**., Khalid, Z.M., Khan, Q.M., Malik, K.A., (1996). Pilot plant studies on biological treatment of hazardous effluents from textile industry. Abstracts. First CESCOB Conference, Department of Biochemistry, University of Agriculture, Faisalabad.
- **Iqbal, S.**, Khalid, Z.M., Khan, Q.M., Malik, K.A., (1995). Color Removal from Textile Industry Effluents Using Indigenous Fungal Strains. In Third National Meeting of Pakistan Society of Biochemists, April 1995. p-92
- **Iqbal, S.**, Khalid, Z.M., Malik, K.A., (1993). Amelioration of Textile Effluent using Microorganisms. Abstracts: 2nd National Symposium on Analytical and Environmental Chemistry, August 28-31. Bara Gali Summer Campus, Univ. of Peshawar, Peshawar, Pakistan.

COURSES/WORKSHOPS/MEETINGS

Participation:

1. One day symposium on "Battling Climate Change and Water crisis-technology nexus for the resonance of humans and nature" at University of Agriculture Faisalabad on 29 October 2018. Organized by institute of soil and environmental sciences, UAF.
2. International conference on "Seawater desalination for water supply and agriculture applications-options for Pakistan" on 24th May 2018 at Pak Secretariat Islamabad organized by Govt. of Pakistan, Planning Commission Ministry of Planning, Development & Reforms Islamabad.
3. Workshop on OPCW activities: ACDA, SPD Chem-Bio Annual Training Program 8-9 March 2017 in PINSTECH, Islamabad.
4. Third training workshop on Project formulation, management and monitoring, 26-27 May 2011" in PAEC HQs, Islamabad.
5. One day workshop on "Writing Research Proposals" 25th June 2010 at NIBGE, Faisalabad.
6. National Executive Management Seminar (NEMS) on "Application of Nuclear Techniques in Water Quality Management and Ecological Research" May 10-12, 2010 at PINSTECH Islamabad.
7. Training course on "Management/ Managerial Skills" 12-17 May, 2008 at Establishment division Govt. of Pakistan, Islamabad
8. Workshop on Utilization of nuclear and other advanced Techniques in Environmental Research" November 13, 2007, at PINSTECH, Islamabad.
9. Two day short course on "Environmental Decision Making for Engineers & Scientists" 03-04 January 2006 at IESE, NUST HQ Rawalpindi
10. Consultative workshop for "Consolidation of Persistent Organic Pollutants (POPs) Inventorization Process" organized by Environment Protection Department (EPD) Government of Punjab, and UNDP-Pops Enabling Activity Project, Pearl Continental Hotel, Lahore, 23-24 December, 2005.
11. One day seminar on "Quality Management and Its Significance in the Present Scenario" 22 September, 2005

12. Training / Inception workshop on "Persistent Organic Pollutants" on 17-18 March (2004). Sponsored by Pakistan Environmental Protection Agency, Ministry of Environment and UNDP at Margalla Motel, Islamabad. Pakistan.
13. Workshop on Industrial Biotechnology (WIB-94), November, 26-29, 1994 National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.

As Faculty:

14. 16th National Training course on "Modern Techniques in Biotechnology" 16-20, April 2018 at SEBD, NIBGE Faisalabad (Organizer Dr. Fathia Mubeen)
15. 15th National Training course on "Modern Techniques in Biotechnology, 17-21, April 2017 at EBD, NIBGE Faisalabad
16. 14th National Training course on "Modern Techniques in Biotechnology, 18-22, April 2016 at EBD, NIBGE Faisalabad
17. 13th National Training course on "Modern Techniques in Biotechnology" 20-24, April 2015 at EBD, NIBGE Faisalabad
18. 12th National Training course on "Modern Techniques in Biotechnology" 17-21, February 2014 at EBD, NIBGE Faisalabad
19. 11th National Training course on "Modern Techniques in Biotechnology" 11-15, February 2013 at EBD, NIBGE Faisalabad
20. Two days workshop on "Promising techniques for Industrial effluent treatment" June 5-6, 2012.
21. 4th National Training Course on "Electron & Confocal Microscopy" 04-14 December 2012 at EBD, NIBGE Faisalabad
22. 9th National Training course on "Modern Techniques in Biotechnology" 7-11, March 2011 at EBD, NIBGE Faisalabad
23. 3rd National Training Course on "Electron & Confocal Microscopy" 12-21 December 2011 at EBD, NIBGE Faisalabad
24. 8th National Training course on "Modern Techniques in Biotechnology" 12-16, April 2010 at EBD, NIBGE Faisalabad
25. 2nd National Training Course on "Electron & Confocal Microscopy" 6-15 December 2010 at SEBD, NIBGE Faisalabad
26. 1st National Training Course on "Electron & Confocal Microscopy" 14-24 December 2009 at SEBD, NIBGE Faisalabad

As co-organizer/faculty

27. 8th National training course on "Molecular diagnosis of infectious diseases of Livestock & Poultry" 6-8 April 2015 at EBD NIBGE, Faisalabad
28. 7th National training course on "Molecular Diagnosis & Prophylaxis of Animal Disease" November 25-29, 2013 at EBD NIBGE
29. National Training course on "Handling and use of Laboratory Animals for Biotechnology and Biomedical Research" 2-4 April, 2013 at NIBGE Faisalabad.
30. 6th National Training Course on "Molecular Diagnosis of Animal Diseases" 15-19 October 2012, at SEBD, NIBGE Faisalabad.
31. Two days workshop on "Promising techniques for Industrial effluent treatment" June 5-6, 2012

32. One day seminar on “Trends in Environmental Biotechnology” April 18. 2011, at EBD, NIBGE, Faisalabad
33. 5th National Training Course on “Molecular Diagnosis of Animal Pathogens” 17-21 October 2011, at SEBD, NIBGE Faisalabad.
34. 4th National Training Course On: Molecular diagnosis of animal pathogens & advanced biotechnological techniques at NIBGE” 2-13 Feb, 2009, NIBGE Faisalabad
35. As a Co-organizer in 3rd National Training Course on ”Molecular Detection of RNA Viruses at NIBGE” 24-26 April, 2007, NIBGE Faisalabad
36. Theoretical course on Biotechnological solutions to combat environmental pollution" November, 21-23, 1995 National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.

INVITED LECTURES/CONFERENCE PRESENTATIONS:

1. Invited lecture on "Bioremediation of environmental contaminants" in 16th National training course on Modern techniques in biotechnology April 16-20, 2018 at NIBGE Faisalabad.
2. Rhizoremediation of herbicide: A green and sustainable approach. In 16th International Congress of Soil Science on “Healthy Soils for Food Security” March 15-17, 2016, Rawalpindi, Pakistan.
3. Isolation, identification and physiological characterization of triazophos degrading bacterial strain In 16th International Congress of Soil Science on “Healthy Soils for Food Security” March 15-17, 2016, Rawalpindi, Pakistan.
4. Invited lecture “Bioremediation of environmental contaminants: a green and sustainable approach” in one day seminar on “Green Technologies in Environmental Sciences: Biofuels and Bioremediation”, Department of Environmental Sciences, FBAS, IIUI, Islamabad on 16th May 2016
5. World Environment day (WED) 2012: Green Economy: Does it include you? Two days workshop on “Promising techniques for Industrial effluent treatment” June 5-6, 2012.
6. Bioremediation and Biodegradation of environmental contaminants, One day seminar on “Trends in Environmental Biotechnology” April 18. 2011, NIBGE, Faisalabad.
7. 13th Soil Science Society Congress on “Efficient Resource Management for Sustainable Agriculture” March 24 to 27, 2010, Serena Hotel, Faisalabad.
8. Conference on "Development and Commercialization of Biotechnology Products" 19-20 June 2009, NIBGE, Faisalabad.
9. International Symposium on “Insect Genomics: Application and Potential for pest control” on March 25, 2009, NIBGE Faisalabad
10. International symposium on “Microbial technologies for sustainable agriculture: Exploring the hidden potential of microbes. March 12-16, 2007 held at NIBGE Faisalabad.
11. “Pakistan Japan Joint Seminar 2007 on Arsenic Issues” held at Lahore College Women University on 24th January 2007.
12. “Workshop on Utilization of nuclear and other advanced Techniques in Environmental Research” November 13, 2007, at PINSTECH, Islamabad.
13. 153rd meeting of the Society for General Microbiology, 8-11 September 2003, UMIST,

Manchester, UK.

14. "Theoretical course on Biotechnological solutions to combat environmental pollution" November, 21-23, 1995 National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.
15. Workshop on Industrial Biotechnology (WIB-94), November, 26-29, 1994 National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.
16. National Conference of Plant Scientists, Feb. 16-18, 1993. Ayub agricultural Research Institute, Faisalabad, Pakistan.
17. 2nd National Symposium on Analytical & Environmental Chemistry, August 28-31, 1993. Bara Gali Summer Campus, Univ. of Peshawar, Peshawar, Pakistan.
18. International Symposium on Biotechnology for Sustainable Development, Dec. 15-20, 1993. National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.
19. National Conference of Plant Scientists, Feb. 16-18, 1993. Ayub agricultural Research Institute, Faisalabad, Pakistan.

RESEARCH INTERESTS

- Development of inocula for bioremediation/phytoremediation of contaminants
- Biodegradation/Bioremediation/phytoremediation of pesticides and other contaminants
- Identification and characterization of microorganisms
- Biodegradation of petroleum hydrocarbons
- Biosurfactant production/ oil degradation/remediation
- Biosorption / biodegradation of dyes present in textile effluents.
- Enumeration/Detection of microorganisms in the environment/contaminated waters.
- Water / waste-water analysis
- Regulation of phosphonate degradation in Gram-negative organisms

TECHNICAL KNOWLEDGE:

- Experience of techniques used in, microbiology, biotechnology, molecular biology Identification of bacteria through 16S rRNA gene analysis
- Experience of analytical techniques used in chemistry e.g. HPLC etc.
- Enumeration/characterization of microbes in the environment.
- Enrichment, isolation and characterization of microorganisms by microscopic, biochemical and molecular biology methods.
- Biodegradation of emerging contaminants including recalcitrant compounds.
- Techniques used in molecular biology i.e. DNA isolation and purification, electrophoresis for separation of DNA and proteins, AFLP analysis, cloning, sequencing, protein-DNA interactions, protein purification etc.

TEACING EXPERIENCE:

- Faculty member of PIEAS; Nine years experience of teaching MPhil and PhD Biotechnology classes as coordinator /co- coordinator at NIBGE
- Lecturing as “faculty member” in various workshops and courses etc held at NIBGE

from time to time.

- Supervision of MPhil and PhD students

OTHER ASSIGNMENTS/EXPERIENCES

- **Research coordinator** MPhil (NIBGE/PIEAS)
- **Teaching** one MPhil and PhD Biotechnology course each as coordinator at NIBGE
- **Reviewer** of many Journals e.g. “Biores. Technol.”, “J. Hazard. Mat.”
- **Warden** Ladies Hostel, NIBGE
- **Convener of Institutional Committees:** Contributing towards procurement being convener “TEC” and member “PEC”
- **Member of Institutional Committees:** Divisional rep in Prequalification and Evaluation, audit and other committees
- **Secretary, IBC:** Evaluation of projects submitted to “Institutional Biosafety Committee” (IBC).