

DR. MUHAMMAD ZUBAIR SHABBIR (DVM, M.Phil., Ph.D.)

Tenured Professor

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BIOGRAPHY

Dr. Muhammad Zubair Shabbir, a microbiologist at the University of Veterinary and Animal Sciences in Lahore, Pakistan, has a distinguished academic and research career spanning several years.

In 2006, Dr. Shabbir received his Doctor of Veterinary Medicine (DVM) degree with distinction, being awarded the Bronze Medal. He subsequently completed his doctoral thesis in Microbiology in 2013, focusing on a culture-independent analysis of the respiratory microbiome of birds using bioinformatic pipelines such as MOTHUR, MEGAN, and METAGENassist. This research, conducted in collaboration with PennState, USA, revealed that birds serve as reservoirs for both known and novel pathogens of public health significance. Dr. Shabbir pursued a Post-Doctorate at the Pennsylvania State University from 2021 to 2022. During this period, he conducted research on various projects, including the isolation and genetic characterization of avian coronaviruses based on complete genome sequencing. He also performed experiments on the persistence and transmissibility of avian reoviruses and coronaviruses. Additionally, Dr. Shabbir contributed to surveillance efforts and characterized the complete genome sequences of *Gallibacterium anatis*, a bacterium associated with avian infections. His research also involved the development of novel diagnostic platforms, specifically utilizing Surface Enhanced Raman Spectroscopy, for coronaviruses and influenza viruses of public health significance.

Since 2006, Dr. Shabbir has been actively engaged as a faculty member at the University of Veterinary and Animal Sciences. He has collaborated with national and international institutes, participated in various fellowships, internships, and training programs related to infection epidemiology, disease diagnostics, bioinformatics, and genomic characterization of pathogens. Dr. Shabbir has an impressive track record of securing research grants, publishing peer-reviewed articles, and fostering international collaborations. He has also been recognized with a research productivity award. Dr. Shabbir remains committed to advancing his expertise in the surveillance and epidemiology of infectious diseases, as well as the molecular characterization of pathogens, particularly Paramyxoviruses and Orthomyxoviruses, originating from animals and humans.

RESEARCH PROJECTS:

1. **Higher Education Commission of Pakistan (2020-2023).** Mapping an in-depth genetic diversity of Infectious Bronchitis Virus (IBV) in Pakistan and development of serotype-matched recombinant IBV Vaccine. Value **\$54,539**. Role: **PI (Approved)**
2. **Higher Education Commission of Pakistan (2015-18).** Sero-epidemiology and molecular characterization of blue tongue virus in Pakistan. Value **\$48,507**. Role: **Co-PI**
3. **Civilian Research and Development Foundation, USA (2016 – 2018).** Deciphering the role of bats as natural reservoirs for zoonotic and emerging pathogens of public health. (Project ID: **GTR3-15-61876-0**). Value **\$44,650**, Role: **PI**
4. **Civilian Research and Development Foundation, USA (2016 – 2018).** Serological evidences for emerging diseases at the level of human and animal interface. Project ID: **GTR2-15-61869-0**). Value **\$44,997**, Role: **Co-PI**
5. **Pakistan Science Foundation (2015 – 2017).** The development and evaluation of thermostable vaccine against peste des petits ruminants (Project ID: **P-UVAS/Bio 544**). Value **\$17,562**. Role: **Co-PI**
6. **Higher Education Commission, Pakistan (2015 -2016).** Sequencing and understanding toward genetic variations in Peste des petits ruminants virus isolates from Punjab province. Value **\$ 4461**. Role: **PI**
7. **Higher Education Commission of Pakistan (2015-16).** Role of host entry factors in pathogenesis of Foot and Mouth Disease. Value **\$5555**. Role: **Co-PI**

8. **Naval Medical Research Unit-3 at Egypt (2014-17)**. Viral and Hemorrhagic Fever disease Surveillance, diagnostic testing and laboratory capacity building in Pakistan (Project ID: N68171-14-P-0240). Value **\$120,000**, Role: **Co-PI**
9. **Defense Threat Reduction Agency, USA (2010-15)**. Spatial ecology and epidemiology of soil-borne human and animal bacterial pathogens and its public health significance in Pakistan (Project ID: 4368-UVAS-DTRA-0080). Value **\$519,854**, Role: **Program Manager/Co-PI**
10. **Defense Threat Reduction Agency, USA. (2010-15)**. A metagenomic approach to the unbiased identification of pathogens endemic to Pakistan (Project ID: 4367-UVAS-DTRA-0081). Value **\$590,000**, Role: **Program Manager/Co-PI**
11. **Punjab Agriculture Research Board, Pakistan (2011-14)**. Development of vaccine for the control of Buffalo and Cattle calf diarrhea. Value **\$165,554**. Role: **Team Member**
12. **World Health Organization (2013-14)**. A pilot study for implementation of a comprehensive Rabies control program in Lahore (Project ID: EMPAK1206232). Value **\$12,000**. Role: **Co-PI**
13. **Higher Education Commission of Pakistan (2012-13)**. Genetic analysis of multidrug-resistant and virulence factors of *Salmonella spp.* in poultry. Value **\$5555**. Role: **Co-PI**
14. **American Association for the Advancement of Sciences (2011 -12)**. Transboundary ecosystem health in the Pamirs, Pakistan (Project ID: S-LMAQM-09-GR-055). Value **\$74,980**, Role: **Co-PI**

HONOURS/AWARDS/FELLOWSHIPS:

1. **Bronze Medalist (DVM); Chief Proctor and Merit Scholarship** during DVM (2001 – 2005)
2. **Biosecurity Engagement Program Fellowship** at The Pennsylvania State University, USA (July – September, 2009)
3. Higher Education Commission (HEC) Pakistan (**PhD Indigenous Scholarship, 2010-2013**)
4. **HEC- IRSIP Fellowship** (September 2012 to February 2013) at The Pennsylvania State University USA
5. **HEC Approved Supervisor** (2013 to date) and **ORCID Researcher** (F-8792-2013)
6. **BBSRC, UK Fellowship** for development of pseudotypes of peste des petits ruminants virus (October 13 – December 12, 2014)
7. British Commission, UK sponsored **ResearcherLink travel grant Fellowship** at The Pirbright Institute, UK from November 15, 2015 to February 06, 2016
8. **Global Outreach Membership (43052540)** – American Society of Microbiology, USA

SELECTED PUBLICATIONS

1. Ul-Rahman A, Rabbani M, **Shabbir MZ**. A comparative evaluation of transcriptome changes in lung and spleen tissues of chickens infected with velogenic and mesogenic Avian Orthoavulavirus 1. *Microbial Pathogenesis*. 2023.174:105956.
2. Ahmad F, Khan MUG, Tahir A, Tipu MY, Rabbani M, **Shabbir MZ**. Two phase feature-ranking for new soil dataset for *Coxiella burnetii* persistence and classification using machine learning models. *Scientific Reports*. 2023. **13**: 29.
3. **Shabbir MZ**, Kariyawasam S, Pierre TA, Dunn PA, Wallner-Pendleton EA, Lu H. Identification, 16S rRNA-based characterization, and antimicrobial profile of Gallibacterium isolates from broiler and layer chickens. *Journal of Veterinary Diagnostic Investigation*. 2023. 35(1): 13 – 21.
4. Aziz MH, **Shabbir MZ**, Ali MM, Asif Z, Ijaz MU. Immunoinformatics approach for epitope mapping of immunogenic regions (N, F and H Gene) of Small Ruminant Morbillivirus and its comparative analysis with standard vaccinal strains for effective vaccine development. *Vaccines*. 2022. 10: 2179
5. Ul-Rahman A, Niaz N, Raza MA, Mehmood A, Rajpoot SU, Abubakar M, **Shabbir MZ**. First emergence of lumpy skin disease in cattle in Pakistan. *Transboundary and Emerging Diseases*. 2022. 1–3.
6. Yasein G, Zahid O, Minter E, Ashraf K, Rashid I, **Shabbir MZ**, Betson M, Sargison ND, Chaudhry U. A novel metabarcoded deep amplicon sequencing tool for disease surveillance

- and determining the species composition of *Trypanosoma* in cattle and other farm animals. *Acta Tropica*. 2022. 230:106416.
7. Mustafa, G.R., Li, C., Zhao, S. **Shabbir MZ**, et al. Metagenomic analysis revealed a wide distribution of antibiotic resistance genes and biosynthesis of antibiotics in the gut of giant pandas. *BMC Microbiology*. (2021). 21: 15
 8. Chaudhry U, Ali Q, Zheng L, Rashid I, **Shabbir MZ** et al. Contrasting population genetics of co-endemic cattle- and buffalo- derived *Theileria annulate*. *Ticks and Tick-borne Diseases*. (2021). 12: 101595
 9. Ul-Rahman A, Shabbir MA, Aziz MW, Yaqub S, Mehmood A, Raza MA, **Shabbir MZ**. A comparative phylogenomic analysis of SARS-CoV-2 strains reported from non-human mammalian species and environmental samples. *Molecular Biology Reports*. (2020). 47(11): 9207-17.
 10. Doyle SR, Tracey A, **Shabbir MZ**, et al. Genomic and transcriptomic variation defines the chromosome-scale assembly of *Haemonchus contortus*, a model gastrointestinal worm. *Communication Biology*. (2020). 3: 656
 11. Jens H. Kuhn.... **Shabbir MZ**, et al. 2020 taxonomic update for phylum *Negarnaviricota* (*Riboviria*: *Orthornavirae*), including the large orders *Bunyavirales* and *Mononegavirales*. *Archives of Virology*. 2020. 165: 3023 – 3072.
 12. Ahmad F, Farooq A, Khan MUG, **Shabbir MZ**, Rabbani M, Hussain I. Identification of most relevant features for classification of *Francisella tularensis* using machine learning. *Current Bioinformatics*. 2020; 15: 1-16
 13. Holder A, Garty R, Elder C, Mesnard P, Laquerbe C, Bartens MC, Salavati M, **Shabbir MZ**, Tzelos T, Connelly T, Villarreal-Ramos B, Werling D. Analysis of genetic variation in the Bovine *SLC11A1* gene, its influence on the expression of NRAMP1 and potential association with resistance to Bovine Tuberculosis. *Frontiers in Microbiology*. 11:1420.
 14. **Shabbir MZ**, Sohail T, Rahman A, Abbas T, Ali Q, Rehman Z, Khan I, Yaqub T, Muhammad J, Khan SA, Imran MS, Basit MA, Ullah S, Habib M, Gardezi SAM, Bashir A, Ahmad M, Abubakar M, Abbas M, Subhani A, Yasein G, Altaaf F, Aziz MH, Hussain R, Zohaib A, Chaudhry U, Wensman JJ. Sentinel surveillance of selected veterinary and public health pathogens in camel population originating from Southern Punjab province, Pakistan. *Acta Tropica*. (2020); 205: 105435
 15. **Shabbir MZ**, Rahman A, Munir M. A comprehensive global perspective on phylogenomics and evolutionary dynamics of *Small ruminant morbillivirus*. *Scientific Reports*. (2020); 10:17
 16. Rahman A, Rohaim MA, Naggard RFE, Mustafa G, Chaudhry U, **Shabbir MZ**. Comparative clinico-pathological assessment of velogenic (sub-genotype VIII) and mesogenic (sub-genotype VI_m) *Avian avulavirus 1* in chickens and pigeons. *Avian Pathology*. 2019; 48(6): 610–621.
 17. Yaqub S, Yaqub T, **Shabbir MZ**, Nadeem A, Mukhtar N, Rehman FA, Rahman A, Shahid MF, Ali M, Sohail T, Tahir Z. Circulation of multiple subtypes (A, G and CRFs 02_AG) of human immunodeficiency virus type-1 (HIV-1) in select districts of Punjab province, Pakistan. *Archives of Virology*. (2019). 164: 3081-3087
 18. Chaudhry U, Q Ali, Rashid I, **Shabbir MZ**, Ijaz M, Abbas M, Evans M, Ashraf K, Morrison I, Morrison L, Sargison ND. Development of a deep amplicon sequencing method to determine the species composition of piroplasm haemoprotozoa. *Ticks and Tick-Borne Diseases*. (2019). 10: 101276
 19. Rahman A, **Shabbir MZ** A comparative phylogenomic analysis of avian avulavirus 1 isolated from non-avian hosts: conquering new frontiers of zoonotic potential among species. *Archives of Virology*. (2019). 164:1771–1780
 20. Rahman A, Munir M, **Shabbir MZ**. A comparative genomic and evolutionary analysis of circulating strains of Avian avulavirus 1 in Pakistan. *Molecular Genetics and Genomics*. (2019). 294:1289–1309.
 21. Muhammad J, Rabbani M, **Shabbir MZ**, Muhammad K, Ghori MT, Chaudhry HR, Ul Hassnain Z, Jamil T, Abbas T, Chaudhry MH, Haisem-ur-Rasool M, Ali MA, Nisar M, Kirimanjeswara GS and Jayarao BM. Cross sectional study and risk factors analysis of *Francisella tularensis* in soil samples in Punjab province of Pakistan. (2019). *Frontiers in Cellular and Infection*

- Microbiology. 9:89.
22. Rohaim MA, El-Naggar RF, Helal AM, Bayoumi MM, El-Saeid MA, Ahmed KA, **Shabbir MZ**, Munir M. Genetic diversity and phylodynamics of *Avian Coronaviruses* in Egyptian wild birds. *Viruses*. (2019). 11(1); 57.
 23. Sohail T, Yaqub T, Abbas T, Rabbani M, Nazir J, Maqbool SM, Yaqub S, Habib M, Rahman A, Mukhtar N, Shahbaz M, Zahoor MY, **Shabbir MZ**. Seroprevalence of Bluetongue virus in small and large ruminants in Punjab province, Pakistan. *Acta Tropica*. (2019). 189: 22-29
 24. Rahman A, Yaqub T, Imran M, Habib M, Sohail T, Shahid MF, Munir M, **Shabbir MZ**. Phylogenomics and infectious potential of *Avian Avulaviruses* species type 1 Isolated from healthy Green-Winged Teal (*Anas carolinensis*) from a wetland sanctuary of Indus River. *Avian Diseases*. (2018). 62(4): 404-415
 25. Shabbir MAB, Wu Q, **Shabbir MZ**, Sajid A, Ahmed S, Sattar A, Tang Y, Li J, Maan MK, Hao H, Yuan Z. The CRISPR-cas system promotes antimicrobial resistance in *Campylobacter jejuni*. *Future Microbiology*. (2018) 13 (16): 1757 – 1774.
 26. Linz B, Mukhtar N, **Shabbir MZ**, Rivera I, Ivanov YV, Tahir Z, Yaqub T and Harvill ET. Virulent epidemic pneumonia in Sheep caused by the human pathogen *Acinetobacter baumannii*. *Frontiers in Microbiology*. (2018). 9:2616.
 27. **Shabbir MZ**, Rahman A, Zahid MN, Munir M. Genetic characterization of small ruminant morbillivirus from recently emerging wave of outbreaks in Pakistan. *Transboundary and Emerging Diseases*. (2018). 65: 2032 – 2038.
 28. Rahman A, Munir M, **Shabbir MZ**. Comparative evolutionary and phylogenomic analysis of Avian avulaviruses 1-20. *Molecular Phylogenetics and Evolution* (2018) 127: 931-951
 29. Habib M, Yaqub T, Nazir J, Shehzad W, Rahman A, Sohail T, Mukhtar N, Mehboob A, Munir M, **Shabbir MZ**. Genomic and biological characterization of Newcastle disease viruses isolated from migratory Mallards (*Anas platyrhynchos*). *Archives of Virology*. (2018) 163: 2179–2188
 30. Malik AI, Ijaz M, Yaqub T, Avais M, **Shabbir MZ**, Aslam H, Aqib AI, Farooqi SH, Sohail T, Ghaffar A, Ali A. Sero-epidemiology of bluetongue virus (BTV) infection in sheep and goats of Khyber Pakhtunkhwa province of Pakistan. *Acta Tropica*. (2018) 182: 207-211.
 31. Sohail T, Yaqub T, Shafee M, Abbas T, Nazir J, Najeebullah, Rabbani M, Chaudhary MH, Mukhtar N, Habib M, Rahman A, Malik AI, Ghafoor A, Zahoor MY, **Shabbir MZ**. Seroprevalence of Bluetongue Virus in small ruminants in Balochistan province, Pakistan. *Transboundary Emerging Diseases*. (2018). 65: 1272-1281
 32. Ghori MT, Khan MS, Khan JA, Rabbani M, **Shabbir MZ**, Chaudhry HR, Ali MA, Muhammad J, Elschner MC, Jayarao BM. Seroprevalence and risk factors of glanders in working equines - findings of a cross-sectional study in Punjab province of Pakistan. *Acta Tropica*. (2017) 176: 134-139.
 33. Yaqub T, **Shabbir MZ**, Mukhtar N, Tahir Z, Abbas T, Amir E, Defang G. Detection of selected arboviral infections in patients with history of persistent fever in Pakistan. *Acta Tropica*. (2017) 176: 34-38.
 34. **Shabbir MZ**, Akhtar S, Tang Y, Yaqub T, Ahmad A, Mustafa G, Alam MA, Santhakumar D, Nair V. Infectivity of wild bird origin Avian Paramyxovirus serotype 1 and vaccine effectiveness in chickens. *Journal of General Virology*. (2016) 97 (12): 3161-3173.
 35. **Shabbir MZ**, Akram S, Hassan Z, Hanif K, Rabbani M, Muhammad J, Chaudhary MH, Abbas T, Ghori MT, Rashid H, Jamil T, Islam Z, Rasool H, Bano A, Ahmad A, Ali MA, Yaqub T, McVey W, Jayarao BM. Evidence of *Coxiella burnetii* in Punjab province, Pakistan. *Acta Tropica*. (2016) 163: 61-69.
 36. **Shabbir MZ**, Ali M, Abbas M, Chaudhary UN, Rehman Z, Munir M. Molecular characterization of infectious bursal disease viruses from Pakistan. *Archives of Virology* (2016) 161(7): 2001-2006
 37. **Shabbir MZ**, Jamil T, Ali AA, Ahmad A, Naeem M, Chaudhary MH, Bilal M, Ali MA, Muhammad K, Yaqub T, Bano A, Mirza AI, Shabbir MAB, McVey WR, Patel K, Francesconi S, Jayarao BM, Rabbani M. Prevalence and distribution of soil-borne zoonotic pathogens in Lahore district of Pakistan. *Frontiers in Microbiology* (2015).

38. **Shabbir MZ**, Malys T, Ivanov YV, Park J, Shabbir MAB, Rabbani M, Yaqub T, Harvill ET. Microbial communities present in the lower respiratory tract of clinically healthy birds in Pakistan. *Poultry Science* (2015). 94(4): 612 – 620.
39. Ahad A, Thorntond RN, Rabbani M, Yaqub T, Younus M, Muhammad K, Mahmood A, **Shabbir MZ**, Kashem MA, Islam MZ, Mangtani P, Burgess GW, Tunf HM, Hoque MA. Risk factors for H7 and H9 infection in commercial poultry farm workers in provinces within Pakistan. *Preventive Veterinary Medicine* (2014). 117:610 – 614.
40. Peyraud A, Poumarat F, Manso-Silvan L, Hamroev K, Tilloev T, Amirbekov M, Tounkara K, Bodjo C, Wesonga H, Nkando IG, Jembere S, Yami M, Cardinale E, Meenowa D, Jaumally MR, Yaqub T, **Shabbir MZ**, Mukhtar N, Halimi M, Ziy GM, Schauwers W, Noori H, Rajabi A, Ostrowski S, Thiaucourt F. An international collaborative study for contagious caprine pleuropneumonia prevalence evaluation and tools for vaccine quality control. *BMC Veterinary Research* (2014). 10: 48.
41. **Shabbir MZ**, Park J, Muhammad K, Rabbani M, Rana MY and Harvill ET. Culture independent analysis of respiratory microbiome of houbara bustard (*Chlamydotis undulata*) revealed organisms of public health significance. *International Journal of Agriculture and Biology* (2014). 16: 222 - 226
42. Iqbal M, Yaqub T, Mukhtar N, **Shabbir MZ**, McCauley JW. Infectivity and transmissibility of H9N2 avian influenza virus in chickens and wild terrestrial birds. *Veterinary Research* (2013). 44: 100 – 109
43. **Shabbir MZ**, Zohari S, Yaqub T, Nazir J, Shabbir MAB, Mukhtar N, Shafee M, Sajid M, Anees M, Abbas M, Khan MT, Ali AA, Ghafoor A, Ahad A, Channa AA, Anjum AA, Kalhoro NH, Ahmad A, Goraya MU, Iqbal Z, Khan SA, Aslam HB, Zehra K, Sohail MU, Yaqub W, Berg M, and Munir M. Genetic diversity of Newcastle disease virus in Pakistan: A countrywide perspective. *Virology Journal* (2013). 10: 170 – 179.
44. Anees M, **Shabbir MZ**, Muhammad K, Nazir J, Shabbir MAB and Munir M. Genetic analysis of peste des petits ruminants virus from Pakistan. *BMC Veterinary Research* (2013). 9: 60 – 64.
45. **Shabbir MZ**, Abbas M, Yaqub T, Mukhtar N, Subhani A, Habib H, Sohail MU and Munir M. Genetic analysis of Newcastle disease virus from Punjab, Pakistan. *Virus Genes* (2012). 46: 309 – 315
46. **Shabbir MZ**, Goraya MU, Abbas M, Yaqub T, Shabbir MAB, Ahmad A, Anees M, Munir M. Complete genome sequencing of a velogenic viscerotropic avian paramyxovirus 1 isolated from pheasants (*Pucrasia macrolopha*) in Lahore, Pakistan. *Journal of Virology* (2012). 86(24): 13828-13829
47. Munir M, **Shabbir MZ**, Yaqub T, Shabbir MAB, Mukhtar N, Khan MR, Berg M. Complete genome sequence of a velogenic neurotropic avian paramyxovirus 1 isolated from Peacocks (*Pavo cristatus*) in a wildlife park in Pakistan. *Journal of Virology* (2012). 86(23): 13113-13114
48. Munir M, Cortey M, Abbas M, Qureshi ZA, Afzal F, **Shabbir MZ**, Khan MT, Ahmed S, Ahmed S, Baule C, Stahl K, Zohari S and Berg M. Phylogenetic analysis and biological characterization of a novel genetic group of Newcastle Disease Virus (NDV) isolated from outbreaks in commercial poultry farms and from healthy backyard poultry flocks. *Infection, Genetics and Evolution* (2012). 12: 1010-1019

ORAL PRESENTATIONS AT NATIONAL/INTERNATIONAL CONFERENCES

1. “**Genetic and pathobiologic characterization of peacock-originated Newcastle disease virus**” at Microbiology, Infectious Diseases and Health Safety conference at University of Swabi dated April 4-5, 2019
2. “**Prevalence status and serotype distribution of Bluetongue in buffalo herds originating from Punjab province Pakistan**” at International Buffalo Congress 2019 at Pearl Continental Hotel, Lahore dated February 18-19, 2019
3. “**Complete genome sequencing and pathobiological characterization of a virulent strain of Newcastle disease virus isolated from migratory Anseriforms (*Anas platyrhynchos*)**” at 2018 PSA Annual Meeting at San Antonio Texas, USA dated July 23-26, 2018

4. **“Evidence of *Coxiella burnetii* in Punjab province, Pakistan”** at International Conference on Agriculture and Biological Sciences at Shanghai, China dated July 23-26, 2016
5. **“Genetic and pathobiologic characterization of pigeon-originated Newcastle disease virus”** at 105th 2016 Poultry Science Association Annual Meeting at New Orleans, Louisiana, USA dated July 11 – 14, 2016
6. **“Investigation of a respiratory disease outbreak in calves; isolation of *Pasteurella multocida* and metagenomics of clinical samples”** at 8th Asian Buffalo Congress from April 21 – 25, 2015
7. **“Microbial communities present in the lower respiratory tract of clinically healthy birds in Pakistan”** at the Annual meeting of Poultry Science Association from July 14 – 17, 2014 at Corpus Christi, Texas, USA
8. **“Spatial Ecology and Epidemiology of Soil borne Human and Animal Bacterial Pathogens and its Public Health Significance in Pakistan”**. DTRA annual review meeting at Washington, USA from November 05 – 07, 2012.
9. **“A Metagenomic Approach to the Unbiased Identification of Pathogens Endemic to Pakistan”**. DTRA annual review meeting at Washington, USA from November 05 – 07, 2012
10. **“Trends in isolation and antimicrobial susceptibility of mastitis causing pathogens of Nili Ravi Buffalo”**. 6th Asian Buffalo Congress (ABC) held at pearl continental Hotel, Lahore on October 27-30, 2009

TRAININGS ORGANIZED/RESOURCE PERSON

1. Participated as a resource person in a national training workshop on **“Molecular detection of food-borne pathogens”** organized by Quality Operations Laboratory, UVAS dated November 28-29, 2019
2. Participated as a resource person in a national training workshop on **“Production of Foot and Mouth Disease virus vaccine using cell suspension culture system”** organized by Center for Biologics Production at Quality Operations Laboratory, UVAS dated June 10-14, 2019
3. Participated as a resource person in a workshop on **“Awareness level biosafety workshop”** organized by Faculty of Veterinary Science, University of Veterinary and Animal Sciences dated August 08-10, 2018
4. Organized and participated as a resource person in one-week international workshop on **“Evaluation of Foot and Mouth Disease Virus vaccine”** jointly organized by SAP Institute, Turkey and Centre for Biologics Production at University of Veterinary and Animal Sciences dated April 23-28, 2018
5. Participated as a resource person in an international training course on **“Poultry viral diagnostics”** jointly organized by Department of Microbiology at University of Veterinary and Animal Sciences and The Royal Veterinary College, University of London dated March 05-12, 2018
6. Organized and participated as a resource person in two-day international workshop on **“Hands-on practical training on tools used for next generations sequencing based microbiome and sequencing data analysis”** to faculty/researchers/Postgraduate students across Pakistan at University of Veterinary and Animal Sciences, Lahore from December 14-15, 2016.
7. Participated as a resource person in three-day international workshop on **“Devising strategies to control emerging viral hemorrhagic fevers in Pakistan”** to medical and veterinary officers, research officers and scientists at University of Veterinary and Animal Sciences, Lahore from November 14-16, 2016.
8. A national workshop organized for faculty/students/researchers on **“Controlling Biorisk in Lab”** at Institute of Public Health, Lahore from May 11-13, 2015.
9. Participated as a resource person in national workshop on **“Molecular Diagnostics”** to Research officer/Scientists/Postgraduate students at UDL, IBBT and QOL, UVAS from June 23 – 25, 2015 under DTRA funded research project.
10. A series of training workshops organized and provided as resource person to veterinarians on **“Methods used in dog sterilization”** at Quality Operations Laboratory, UVAS from

- august 21-September 13, 2014 under WHO sponsored research project
11. Training provided as resource person to faculty/students/researchers on “**Basic molecular biology techniques**” at Quality Operations Laboratory, UVAS, Lahore from June 2-3, 2014.
 12. Training organized and provided to ADIO’s & VO’s of DADRS, Livestock and Diary Development Department, Punjab on “**Disease surveillance, diagnostics and reporting**” at Quality Operations Laboratory, UVAS, Lahore from June 2-3, 2014.
 13. Training organized and provided to Research officer/Scientists/Postgraduate students “**Real Time PCR; applications in surveillance and disease diagnostics**” at University Diagnostic Laboratory and Quality Operations Laboratory of UVAS from August 15 -16, 2013 under DTRA, USA sponsored research project.
 14. National awareness conference on “**Tuberculosis a Zoonosis**” organized at Quality Operations Laboratory, UVAS on April 16, 2013
 15. Training organized and provided to Research officer/Scientists from different teaching and research institutes of Pakistan on “**Application of Bio-informatics in understanding the nature of microbes**” at University Diagnostic Laboratory and Quality Operations Laboratory of UVAS from August 01 -02, 2012 under DTRA, USA sponsored research project.
 16. Training organized and provided to Research officer/Scientists from different teaching and research institutes of Pakistan on “**GIS/GPS applications in epidemiology of human and animal disease and in biological science research**” at University Diagnostic Laboratory, UVAS and GC University Lahore from November 28 to December 02, 2011 under DTRA, USA sponsored research project.
 17. Training provided to Research officer/Scientists from different teaching and research institutes of Pakistan on “**Diagnostic approaches towards Avian Mycoplasmosis**” organized at University Diagnostic Laboratory, UVAS, Lahore from January 06-07, 2011.
 18. Training provided to ADIO’s & VO’s of DADRS, Livestock and Diary Development Department, Punjab on “**Advanced Laboratory Techniques for Veterinary Disease Diagnostics**” organized at University Diagnostic Laboratory, UVAS, Lahore from May 17-21, 2010.
 19. Training provided to ADIO’s & VO’s of DADRS, Livestock and Diary Development Department, Punjab on “**Basic Disease Diagnostics in Livestock and Poultry**” organized at University Diagnostic Laboratory, UVAS, Lahore from April 05-10, 2010.
 20. Training provided to SRO’s & VO’s of Poultry Research Institute (PRI), Livestock and Diary Development Department, Punjab on “**Advanced Diagnostics and Control of Poultry Diseases**” organized at University Diagnostic Laboratory, UVAS, Lahore from May 17-21, 2010.
 21. Training provided to Lab staff of the Livestock and Diary Development Department, Punjab on “**Advanced Laboratory Techniques for Veterinary Disease Diagnostics**” organized at University Diagnostic Laboratory, UVAS, Lahore from May 04-16, 2010.

TRAININGS/WORKSHOPS/CONFERENCES/COURSES (ATTENDED)

1. A 32-contact hour international workshop on “**Advanced agriculture biorisk training**” organized by the University of Tennessee and the Centre for Agriculture and Food Security and Preparedness at Jakarta Indonesia dated September 02-05, 2018
2. International workshop on “**Arboviruses update: Field epidemiology, laboratory diagnostics and vector analysis**” jointly conducted by Agha Khan University, Pakistan and University of Florida, USA at Department of Pathology and Laboratory Medicine, Agha Khan University, Karachi dated May 08-10, 2018
3. Training course on “**Transport of infectious substances**” based on applicable international shipping regulation organized by the World Health Organization at Islamabad, Pakistan from October 18-19, 2017.
4. Training on “**Quality evaluation of Foot and Mouth disease vaccine**” at SAP institute, Ankara Turkey from October 02-06, 2017
5. Completed “**40 hours of BioPrism laboratory safety training initiative program under “Train the Trainer” workshop**” organized by PBSA Pakistan and NIH, USA from August 1-5, 2016 at Best Western Hotel Islamabad.
6. Course (08 credit Hour) on “**Surveillance and control of Rabies**” at Institute Pasteur,

Phnom Penh Cambodia from August 25 – November 07, 2015 organized by WHO, University of Lausanne and Institute Pasteur France.

7. Research cum training on **“Development of pseudotypes for peste des petits ruminants virus”** from October 13 to December 12, 2014 at Animal and Plant Health Agency UK under BBSRC funded research project.
8. Training on **“Molecular and serological tools for Dengue and CCHF diagnosis”** at US Naval Medical Research Unit No. 3, Cairo Egypt from June 16 – 20, 2013.
9. Participated in programmatic and technical review entitled **“Cooperative counter-weapons of mass destruction research with global partners”** organized by Defense Threat Reduction Agency from November 05 -07, 2012 at Washington DC, USA
10. Training on **“Application of Bioinformatics in the field of microbial genetics”** at Swedish University of Agricultural Sciences, Uppsala, Sweden from April 05 – 18, 2012 under a collaborative and DTRA, USA funded research project.
11. Training on **“Metagenomics and DNA sequence analysis using MEGAN and MOTHUR”** at Agricultural Sciences Building, PennState University, USA from September 07 – 09, 2011 under a collaborative and DTRA, USA funded research project.
12. One-week training on **“Geospatial mapping and its role in impact study of soil and food borne human and animal bacterial pathogens”** at Animal Diagnostic Laboratory, PennState University, USA from September 01 - 07, 2011 under a collaborative and DTRA, USA funded research project.
13. Two weeks training on **“Real Time PCR, PCR-DGGE and other molecular techniques for characterization of bacterial pathogens”** at Animal Diagnostic Laboratory, PennState University, USA from August 15 – 31, 2011 under a collaborative and DTRA, USA funded research project.
14. Three months training on **“Animal disease research and Molecular diagnosis”** at Animal Diagnostic Laboratory, Wiley Lab., PennState University, USA from July 1, 2009 to September 30, 2009 funded by Biosecurity Engagement Programme (BEP), United States Department of State, USA.
15. Participated in **“81st Northeastern Conference on Avian Diseases”** on September 17-18, 2009 held at Holiday Inn, Harrisburg, Pennsylvania, USA.
16. Forty Days training workshop on **Staff Development Course”** by National Academy of Higher Education (NAHE, HEC), held at U.V.A.S, Lahore on December 15, 2006 to January 25, 2007
17. Eight days International training workshop on **“Characterization and Management of Newly Emerging Viral Diseases in the Developing World”** by NIBGE, Faisalabad on November 14 – 22, 2006
18. One-week workshop on **“Practical Veterinary Epidemiology”** by Institute of Continuing Education and Extension, UVAS, Lahore on November 4 – 11, 2006
19. One-week Workshop on **“Production and Evaluation of Bird Flu Vaccine”** by Institute of Continuing Education and Extension, UVAS, Lahore on June 19 – 25, 2006
20. Two-week Workshop on **“Preparation and Evaluation of FMD Vaccine”** by Institute of Continuing Education and Extension, UVAS, Lahore on May 16 - 30, 2006.