

CURRICULUM VITAE

Current Postal Address: 726 Carroll Avenue Unit #4, Ames 50010, Iowa, USA.

Office Address: USDA-ARS, 1920 Dayton Ave, 50010, Ames, USA.

Mobile Number: +15155095140, **Email:** Harish.Menghwar@usad.gov

Personal Bio Data

NAME: Harish Menghwar
Date of Birth: April 1st, 1985
Religion: Hindu
Passport Number: CM6915103
Country: Pakistan
Country of Residence: USA
Visa Type: J1 visa

Educational Background

Huazhong Agricultural University, Wuhan, China **Ph.D. in Preventive Veterinary Medicine (2017)**
(Doctorate, Verified by WES: ECA# 46983221MM)

Sindh Agriculture University, TandoJam, Pakistan **M.Sc. (Hons.) in Veterinary Microbiology (2010)**

Sindh Agriculture University TandoJam, Pakistan **DVM. Doctor of Veterinary Medicine (2008)**

Core Competence

Cell-Culture (cells & cell lines) | Complement-mediate killing | Next-Generation Sequence analysis | Animal Model experiment| Molecular Biology| Data analysis- Presentation | Team Player | Problem Solving | Technical Guidance

Research Experience

- 12/12/2022 - Present** **USDA-ARS Postdoctoral Molecular Biologist Research Fellow, USDA/ARS Ames, IA, USA.**
- Vaccine development of Bovine Respiratory diseases
 - Bovine respiratory diseases (BRD)& host-pathogen interaction
 - Complement mediate killing and phagocytosis mechanism.
 - Mutant construction of *M. haemolytica*
 - Cytokines therapy and immune response mechanism of adeno and BVDV
- 18/10/2021 -09/12/2022** **Postdoctoral Research Fellow, CHUL de Quebec, University of Laval, Canada**
- HEC1-A, MCF-7, T47-D breast cancer cell line
 - Animal Model trials using inhibitors,
 - cytotoxicity and tumor progression.

- Breast cancer and steroid-binding assay with ERs receptors
- Competitive receptor binding of radioactive assay
- COVID-19 propagation and immunoassays
- Post-translation mechanism of breast cancer

09/2019 -08/2021

Postdoctoral Research Fellow

Vaccine and Infectious Diseases Organization (VIDO), University of Saskatchewan, Canada

- Explored the role of complement-fixing antibodies in the killing of *M. bovis* in-vitro and whether animals vaccinated with proteins that elicit antibodies capable of complement-fixing would be protected against an experimental challenge.
- Animal vaccine trials co-infection with BHV-1, *M. haemolytica*, and *M. bovis* intra-nasal challenged.
- Necropsy at PDS and collect the sample from lungs, BAL fluid, joint fluid, disease, normal and pericardium fluid.
- Purification of immunoglobulin from pre-and post-challenge sera, performed invasion and adhesion assay.
- Perform gentamicin killing assay and serial dilution for three different time points in triplicate.
- Identification of purified proteins using SDS, WB.
- Whole-genome sequencing of four Canadian *Mycoplasma bovis* isolates with Illumina Nova Seq and PacBio Sequencing
- Novel vaccine trials against *M. bovis* in cattle
- Development of a novel core genome Multilocus sequence typing (cgMLST) scheme of *Mycoplasma bovis*
- Comparative whole-genome sequence (WGS) analysis of *M. bovis* strains isolated from cattle and bison
- Multilocus sequence typing (MLST) and Multi-locus variable-number tandem repeats (MLVA) typing of 60 *M. bovis* isolate from cattle and bison.
- GAPDH typing of *M. bovis* isolates from Cattle and bison
- Reversal of bovine PBMC proliferation inhibition and apoptosis
- Immuno-inhibitory role of programmed death receptor-1 and its ligand during *M. bovis* infections in bison

12/ 2018 – 08/2019 Postdoctoral Researcher

School of Public Health, Sun Yat-Sen University of Medical Sciences, Guangzhou, China

- Mosquito cell line culture (C6/36)
- Analyzing glycan array typing among four types of dengue virus
- Whole-genome sequences of Dengue and Chikungunya virus.
- Involved in One World and One Health and Zoonosis projects.
- Supervision of two master's students

04/ 2018 – 10/2018 Veterinary Research Officer

Directorate of Animal Breeding Sindh Hyderabad, Pakistan

- writing research project proposals on animal genetics, artificial insemination, and implementation.
- Cattle genome variation analysis
- Analysis of genome traits among two different breeds
- Planning and management, conducting livestock breeding and genetic improvement training.

09/2013 - 12/ 2017 PhD Scholar

State Key Laboratory of Agricultural Microbiology, College of Veterinary Medicine, Huazhong Agricultural University, Wuhan, China.

- Prepare research projects and implement.
- International research collaboration
- Bacterial DNA, RNA, and protein extraction and purification
- Perform PCR, RT-PCR, qPCR, SDS, and western blot.
- BoMac Cell lines, Binding and invasion assay, apoptosis
- MTT assay of Cell Viability
- NETs formation and degradation., localization of rMbovNase
- Nuclease *M. bovis* protein activities
- Genotyping and genetic diversity analysis
- Analyzed the genomic variants, diversity,
- Whole-genome sequences,
- WGSNP, MLST, cgMLST, and MLVA
- Prediction of membrane and secretory proteins.
- Antibiotic drug efflux of *M. bovis* isolates

01/ 2011 – 08/2013 Veterinary Research Officer

Directorate of Animal Breeding Sindh Hyderabad, Pakistan

- Involve in writing research projects proposals on animal genetics, artificial insemination, and implementation.
- Planning and management, conducting livestock breeding and genetic improvement training.

11/2008 – 10/2009 House Job Officer (Research and Vaccine Production)

Central Veterinary Diagnostic Laboratory and Vaccine Production Unit, Tando Jam Sindh; Pakistan.

- Preparation of Vaccines for different infectious diseases such as FMD, Bluetongue, Black Quarter, and Hemorrhagic Septicemia.
- Worked in different sections of CVDL, like virology, bacteriology, and Parasitology

List of Publications

Paper published (*First author, equal contribution**, Corresponding author† & co-author§) in multidisciplinary journals (MD) with Impact factor (IF), and papers published in top 5% in Veterinary Science are highlighted in blue (all according to Web of Science and google scholar)

1. **Menghwar H*** Tatum F. M, Briggs R. E, Casas E, Kaplan B. S, Azadi P, Dassanayake P. R. Enhanced phagocytosis, and complement-mediated killing of *Mannheimia haemolytica* serotype 1 following in-frame CMP-sialic acid synthetase (neuA) gene deletion 2023. Accepted in *Microbiology Spectrum* **IF 9.02**
2. **Menghwar H****, Prysliak T, Perez-Casal J. Complement-mediated killing of *Mycoplasma bovis* does not play a role in the protection of animals against an experimental challenge Vaccine. 2023 Feb; 41-10, 1743-1752 DOI: 10.1016/j.vaccine.2023.0 **MD IF5.5**
3. **Menghwar H*†**, Guo A, Chen Y, Lysnnyansky I, Parker A M, Prysliak T, Perez-Casal J. A Core Genome Multilocus Sequence Typing (cgMLST) analysis of *Mycoplasma bovis* isolates. J.Vet

4. **Menghwar H***†, Prysliak T, Perez-Casal J. Phylogeny of *Mycoplasma bovis* isolates from cattle and bison based on multilocus sequence typing and multiple-locus variable-number tandem repeats. *Vet Microbiol.* 2021Jul; 258:109124. DOI: 10.1016/j.vetmic.2021.109124. **Q1 Top 5% Veterinary Science IF3.03**
5. **Menghwar H***, Prysliak T, Perez-Casal J. Complete Genome Sequences of Four Canadian *Mycoplasma bovis* Strains Isolated from Bison and Cattle. *Microbiol Resour Announc.* 2021 April 29;10(17). DOI: 10.1128/MRA.00136-21.
6. **Menghwar H***†., Prysliak T., Perez-Casal J., Comparative whole-genome analysis of *Mycoplasma bovis* isolated from Bison and cattle, *CIMID* June (2022), DOI.org/10.1016/j.cimid.2022.101835 **MD IF2**
7. Faisal M, Hassan M, Kumar A, Zubair M, Jamal M, **Menghwar H§**, Saad M, Kloczkowski A, Hematopoietic Stem and Progenitor Cells (HSPCs) and Hematopoietic Microenvironment: Molecular and Bioinformatic Studies of the Zebrafish Models, *Int. J. Mol. Sci.* 2022 23(13) 7285, doi.org/10.3390/ijms23137285 **MD Q1 IF5.7**
8. Rauf U, Suleman M, Abid A, Jamil H, **Menghwar H§**, Durrani AZ, Rashid MI, Akbar H. Humoral and Cell-Mediated Immune Response Validation in Calves after a Live Attenuated Vaccine of *Babesia bigemina*. *Pathogens.* 2020 Nov 11;9(11). DOI: 10.3390/pathogens9110936. **Q2 IF3.7**
9. Zubair M, Khan FA, **Menghwar H§**, Faisal M, Ashraf M, Rasheed MA, Marwan MA, Dawood A, Chen Y, Chen H, Guo A. Progresses on bacterial secretomes enlighten research on *Mycoplasma* secretome. *Microb Pathog.* 2020 Jul; 144:104160. DOI: 10.1016/j.micpath.2020.104160. **MD IF3.8**
10. Zubair M, Muhamed SA, Khan FA, Zhao G, **Menghwar H§**, Faisal M, Zhang H, Zhu X, Rasheed MA, Chen Y, Marwan MA, Chen H, Guo A. Identification of 60 secreted proteins for *Mycoplasma bovis* with secretome assay. *Microb Pathog.* 2020 Jun; 143:104135. DOI: 10.1016/j.micpath.2020.104135. **MD IF3.8**
11. Chen X, Huang J, Zhu H, Guo Y, Khan FA, **Menghwar H§**, Zhao G, Guo A. P27 (MBOV_RS03440) is a novel fibronectin-binding adhesin of *Mycoplasma bovis*. *Int J Med Microbiol.* 2018 Oct;308(7):848-857. DOI: 10.1016/j.ijmm.2018.07.006. **MD IF4.1**
12. Khan FA, Zhao G, Guo Y, Faisal M, Chao J, Chen X, He C, **Menghwar H§**, Dad R, Zubair M, Hu C, Chen Y, Chen H, Rui Z, Guo A. Proteomics identification and characterization of MbovP730 as a potential DIVA antigen of *Mycoplasma bovis*. *Oncotarget.* 2018 Jun 19;9(47):28322-28336. DOI: 10.18632/oncotarget.22265 **MD IF5.168**
13. **Menghwar H***, He C, Zhang H, Zhao G, Zhu X, Khan FA, Faisal M, Rasheed MA, Zubair M, Memon AM, Ridley A, Robertson ID, Chen Y, Guo A. Genotype distribution of Chinese *Mycoplasma bovis* isolates and their evolutionary relationship to strains from other countries. *Microb Pathog.* 2017 Oct; 111:108-117. DOI: 10.1016/j.micpath.2017.08.029. **MD IF3.8**
14. Khan FA, Rasheed MA, Faisal M, **Menghwar H§**, Zubair M, Sadique U, Chen H, Guo A. Proteomics analysis and its role in elucidation of functionally significant proteins in *Mycoplasma bovis*. *Microb Pathog.* 2017Oct; 111:50-59. DOI: 10.1016/j.micpath.2017.08.024. **MD IF3.8**

15. Rasheed MA, Qi J, Zhu X, Chenfei H, **Menghwar H§**, Khan FA, Zhao G, Zubair M, Hu C, Chen Y, Chen H, Guo A. Comparative Genomics of *Mycoplasma bovis* Strains Reveals That Decreased Virulence with Increasing Passages Might Correlate with Potential Virulence-Related Factors. *Front Cell Infect Microbiol.* 2017; 7:177. DOI: 10.3389/fcimb.2017.00177 **MD IF5.7**
16. Memon AM, Bhuyan AA, Chen F, Guo X, **Menghwar H§**, Zhu Y, Ku X, Chen S, Li Z, He Q. Development and Validation of Monoclonal Antibody-Based Antigen Capture ELISA for Detection of Group A Porcine Rotavirus. *Viral Immunol.* 2017 May;30(4):264-270. DOI: **IF2.2** 10.1089/vim.2016.0154.
17. Khan FA, Faisal M, Chao J, Liu K, Chen X, Zhao G, **Menghwar H§**, Zhang H, Zhu X, Rasheed MA, He C, Hu C, Chen Y, Baranowski E, Chen H, Guo A. Immunoproteomic identification of MbovP579, a promising diagnostic biomarker for serological detection of *Mycoplasma bovis* infection. *Oncotarget.* 2016 Jun 28;7(26):39376-39395. DOI: 10.18632/oncotarget.9799. **MD IF5.168**
18. Zhang H, Zhao G, Guo Y, **Menghwar H§**, Chen Y, Chen H, Guo A. *Mycoplasma bovis* MBOV_RS02825 Encodes a Secretory Nuclease Associated with Cytotoxicity. *Int J Mol Sci.* 2016 Apr 29;17(5). DOI: 10.3390/ijms17050628. **MD Q1 IF5.7**

Research Skills

- **Large Animal Model Experiments-** Design, prepare protocol and implement: (Blood collection, sample collection with diseases lesion and healthy lungs, Bronchi alveoli lavage (BAL), joint fluid, thymus, liver, spleen, kidney and pericardium fluid.
- **Small animal model experiments:** Anesthesia, Blood collection from heart, Injection of S/C, I/P, and euthanizing mice. Collect samples from the liver, kidney, reproductive organs, heart, and blood.
- **Cellular and Molecular techniques** – Bovine Epithelial cell line (EBL), BoMac, Btu, MDBK cell lines, Isolation culture and propagation Cell culture, Invasion Assay, adhesion assay. Western blotting, Immunoprecipitation, Protein purification, 2DE, MS, Serum Killing assay, whole blood killing assay, Flowcytometry, DNA/RNA extraction, Cloning, mutagenesis, transfection, recombinant protein purification, SDS-PAGE, ELISA. Immunohistochemistry, RNA preparation & gene expression profiling, RT- PCR, confocal microscopy, Neutrophils extraction,
- **Genotyping techniques:** Multilocus sequence typing (MLST), Multilocus variable number tandem repeats (MLVA), Pulsed Field Gel Electrophoresis (PFGE) population structure, RFLP, RAPD, Genotyping, Site-directed mutagenesis. Sorting and Methanol fixation of cells for single cells RNA sequencing.
- **Whole Genome Sequence analysis:** Core-genome Multilocus sequence typing (cgMLST), Whole-genome single nucleotide polymorphism analysis (WGS-SNP) analysis. WGS mapping, assemble, align, annotation. Gene ontology, COG, KEGG, Core genome, pan-genome, virulence genes, and metabolic pathways. Pangenome, core genome, and peptide vaccine design construction
- **Microscopy-** Confocal microscopy (Zeiss LSM 700, LSM 800), Time-lapse Live-cell Imaging, Image analysis with ImageJ, Whole Tissue clearing, and imaging at a multi-photon microscope.
- **Managerial Skills**

Collaborated well with a multidisciplinary team of scientists and clinicians for the experimental setup. Leading a group of students/ technicians to manage and execute challenging Research projects Optimized protocols and wrote SOPs. Management and Documentation of Clinical Trial data.

Scholarships & Awards

- **Award of Postdoctoral Research Fellowship (10-2021-12-2022)**, CHUL de Quebec, University of Laval, Canada.
- **Award of Postdoctoral Fellowship (09-2019-08-2021)**, Vaccine and Infectious Disease Organization (VIDO), University of Saskatchewan, Canada.
- **Award of Chinese Postdoctoral Research Fellowship, (12-2018- 08-2019)**, Sun Yat-Sen University (SYSU), Guangzhou, China
- **Winner of the “Best Oral Presentation Award” (Jan. 2018)** at the First Academic Annual Symposium for international students at Huazhong Agricultural University, Wuhan, China.
- **Award of the Chinese Government Scholarship Council (CSC) for pursuing PhD Study (09-2013 to 12-2017)** at Huazhong Agricultural University Wuhan, China.
- **Award of Pakistan Minority Scholarship Council for Master Study (2009-2010)** at Sindh Agriculture University TanodJam, Pakistan.

Training and Workshops attended

1. **Respiratory Protection training**, Nov. 2021, CHUL de Quebec, University Laval. Canada.
2. **Rats and Mice Introduction Training**, Nov. 2021, Animal Facility, CHUL, University Laval Quebec Canada.
3. **COVID-19 Health and Safety Training (Online)**, May 2020, Safety resources at University of Saskatchewan Canada.
4. **Radiation Safety Training**, Dec. 2019, Safety resources at the University of Saskatchewan Canada.
5. **UACC Animal Ethics Course Training.**, Oct. 2019., Research Service and the Ethics at the University of Saskatchewan Canada.
6. **Confocal Microscopy Training**, Oct. 2019., at VIDO, University of Saskatchewan, Canada.
7. **WHIMS Training**, Sept.2019., Safety resources at the University of Saskatchewan Canada.
8. **Laboratory Safety Training**, Sept.2019., Safety resources, at the University of Saskatchewan Canada.
9. **Biosafety Training**, Sept. 2019., Safety resources at the University of Saskatchewan Canada.
10. Attended symposium **One World, One Health: Preventing Zoonoses Together, International Symposium on Zoonoses and Rabies Conference in China** 9-11, May 2019. Organized by Preventive Veterinary Medicine Association China at Hefei, China
11. Three days’ workshops attended on **“U.S.-China Dialogue and Workshop on the Challenges of Emerging Infections, Laboratory Safety, Global Health Security and Responsible Conduct in the Use of Gene Editing in Viral Infectious Diseases Research”** 8-10 January 2019 at Comprehensive Laboratory Building, Harbin Veterinary Research Institute, CASS Harbin, P.R, China.
12. Three days **“International Symposium on Mycoplasma Biology, Pathogenesis, Immunity and**

- Mycoplasmosis control in animals**", Nov. 28-30, 2018, at Pig Innovative and Sustainable Laboratory, Huazhong Agricultural University, Wuhan, P.R, China.
13. Three days of Hands-on Training Workshop on **Next Generation Sequencing (NGS) Data Analysis**, Nov. 14-16, 2018, organized by Next-Gen, Solution GENET, and PASTIC Islamabad, Pakistan.
 14. **First Annual Academic Symposium for International Students**" at Huazhong Agriculture University, Wuhan, Hubei, P.R China.
 15. Seven days, **"2nd BCIM Seminar and Workshop on Livestock Production Management and Diseases Prevention Techniques"** arranged (4th Dec to December 11, 2016) by Yunnan Academy of Science and Technology Development at Kunming, Yunnan province P.R China.
 16. The three-day conference on "Projects Requirements in the collection for Foreign Expert in Livestock industry" (28-30, July 2016), Municipal Party Committee, People's Government Taian City, Shandong Province, P.R China.
 17. Three days attended the **"Foreign Expert Exchange and Cooperation Conference"** (26-28, Sept. 2016) arranged by Chinese Government officials, Municipal Party Committee, Liaocheng City, Shandong province, P.R, China.
 18. Six Days Training of **Veterinary Epidemiology** for Chinese University Academics Staff, with Collaboration of **FAO and Murdoch University of Australia**, at Huazhong Agricultural University, Wuhan, Hubei, P.R, China.
 19. One-month Training course in **Dairy Farm Management under USAID-DRDF Dairy Project's support for Dairy Farm Managers** from 6th. Feb. 2013 to 6th. March. 2013. Collaborate with the **University of Veterinary & Animal Sciences (UVAS), Lahore, Pakistan.**
 20. Three days of **Training of Trainers (TOT)** on **"Teaching Techniques, Agriculture and Livestock Management"** under **Oxfam Belgium Project**, from October 15 to 17.Oct. 2011.
 21. Seven Days Training Course on **"Artificial Insemination Technique"** under **ADP-Scheme No.46"DEVELOPMENT OF MILK AND MEAT PRODUCTION IN SINDH"**; Directorate Animal Breeding Sindh Hyderabad, held at Research & Training Institution for Livestock Development Tando Muhammad Khan from 23.05.2011 to 29.05.2011, Pakistan.

Bioinformatics and computer skills

- Experienced in Microsoft Office, PPT, Excel
- MEGA v.6, START.2v.10 (for sequence analysis)
- Ridom SeqSphere⁺ Software (Ridom GmbH MuEnster Germany),
- Bio numeric software version 1.2.1 (Applied Biosystems),
- R Language, STAT, SPSS, MATLAB.,
- Endnote x4, CellP, Adobe Photoshop CS5,
- Geneious v.10, Gel J, Bio-Linux VMWare workstation., DNASTar
- GraphPad Prism V.9

Membership of Professional Bodies

1. Member of the International Organisation for Mycoplasmaology (IOM) (2023- current)
2. Member of the Pakistan Veterinary Medical Council (PVMC) (2008 - current)

References:

1. Jose Perez-Casal, PhD

Research Scientist

Vaccine and Infectious Diseases Organization (VIDO),

University of Saskatchewan, 120 Veterinary Rd

Saskatoon, SK S7N 5E3.

Ph: (306) 966-8870

Fax: (306) 966-7478

Email: jose.perez-casal@usask.ca

2. Aizhen Guo, Ph.D., Professor

State Key Laboratory of Agricultural Microbiology

Department of Preventive Veterinary Medicine

College of Veterinary Medicine

Huazhong Agricultural University

Shizishan 1, Wuhan, 430070, China.

Email: aizhen@mail.hzau.edu.cn

Tel: 0086-27-87286861

3. Muhammad Suleman, PhD (France)

Assistant Professor,

University Diagnostic Laboratory,

Institution of Microbiology,

University of Veterinary and Animal Sciences,

Main campus, Lahore Pakistan

Email: muhammad.suleman@uvas.edu.pk

Tel : +92 333 4107225