

**Dr. Zaheer Hussain**

(Ph. D Biological Sciences, specialization in molecular animal virology and genetically recombinant cell culture based vaccine development)

Date of Birth: May 12, 1975

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**RESEARCH ACTIVITIES:**

The study of molecular biological techniques for diagnosis and epidemiology of infectious diseases particular of Public health importance and their vaccine and antibody development.

**Significant Achievements:**

- Developed first Pakistani genetically modified rabies cell culture based vaccine through reverse genetics.
- First time sequenced full length genome of two rabies virus isolates of Pakistan
- Won gold medalist in teaching training from Ali Institute of Education.
- Member of group of scientists who studied epidemiology of buffalo pox virus, sheep pox virus and camel pox virus in Pakistan.

**Research Experiences:**

- Find molecular epidemiology of rabies virus in Pakistan.
- Sequencing of full length genome of two rabies virus variants of Pakistan.
- Amplified and sequenced of complete nucleoprotein and pseudogene region of Rabies virus samples and partial L gene of rabies Virus.
- Amplified, cloned and sequenced glycoprotein G gene of Rabies virus samples.
- Sero typing of Pakistan rabies virus samples.
- Developed genetically modified cell culture vaccine with single G insert and double G insert by reverse genetics.
- Grow virus on BSR cell line and titrate it.
- Developed BSR cells on Serum free media and work for glycoprotein G purification.
- Trial of developed vaccine in mice by intramuscular and per oral route.
- Performed DRIFT to know the antibody titer of experimental animals.
- Diagnosis of Rabies virus by Mice inoculation, DFA, DRIT and PCR.
- A part of team who develop first polymerase chain reaction based diagnosis of rabies virus in Pakistan.
- Isolation and Amplification Vp1 region of Foot and Mouth Disease Virus
- Find the descriptive epidemiology of bovine sub clinical mastitis in Pakistan

**Expertise on Advanced Equipments and Techniques:**

- Epidemiological analysis of various Diseases
- DNA Sequencing and Sequencing Analysis
- Vaccine development through cloning and reverse genetics.
- DFA( direct fluorescent antibody Technique)

- DRIT (Direct Rapid Immunohistochemical Test )
- RIFFT(The Rapid Fluorescent Focus Inhibition Test )
- Virus Typing
- Cell culture
- Virus Amplification through Animal Inoculation

#### Students supervised

Ph. D	2	M.Sc./M. Phil	20	B Sc. (Hons)	30	
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#### Publication:

1. Rai Shafqat Ali Khan; Mudasser Habib; Mohammad Salah-UD-Din Shah; Waqas Ali; **Zaheer Hussain**; Zahid Ali Tahir (2017) "Molecular Characterization of novel strains of Infectious Bursal Disease Virus in Pakistan" Submitted in archives of virology.
2. Shahin, Farzana, Zafar Qureshi, Mahmood ul Hassan, **Zaheer Hussain**, Masood Rabbani, Khawar Ali Shahzad, Saiqa Iqbal, Waqas Ahmed Rao, and Tahir Yaqub (2015) "Surveillance for Probable Detection of Rabies Virus in Wild and Domestic Animals." [http://thesciencepublishers.com/biomed\\_lett/files/BML126052015%20\(2\).pdf](http://thesciencepublishers.com/biomed_lett/files/BML126052015%20(2).pdf).
3. Zafar ul Ahsan Qureshi, Muhammad Numan, Abdul Whab Manzoor, Shahida Afzaal, **Zaheer Hussain** (2011) Coincidence of Haemorrhagic Septicemia and Rabies *Mat Soc Med.* 23(4): 192-194
4. **Zaheer Hussain**, Muhammad Saleem Haider, Zafar Ul Ehsan Qureshi, Andres Velasco-Villa, Shahida Afzaal and Xianfu Wu (2012) Development of genetically recombinant rabies vaccine *J Antivir Antiretrovir* 2013, S15-03 (Impact Factor 3.263)
5. Shahida Afzaal, Muhammad Numan, Zafar ul Ahsan Qureshi, Munazza Shaukat, Imtiaz Ahmad Khan , **Zaheer Hussain**, Zain ul Abidin, Abdul Whab Manzoor, Mudasser Habib (2013). Ante-Mortem Diagnosis of Rabies in Cows and Buffaloes. *Journal of Advanced Veterinary Research* 3: 27-30

#### Research presented /Published in Conferences, Symposia or Workshops

- Ayesha Nisar, Qurat Ul Ain Bukhari, Dr. Nasir Ahmad, **Dr. Zaheer Hussain** and Dr. Muhammad Saleem Haider “Heavy Contamination of Raw, Ready to Cook and Ready to Eat Meat Products with Salmonella and E. coli” accepted in International Conference “Foods Of Animal Origin” at University Of Agriculture Faisalabad (March 30-31st, 2017).
- Rabail Asghar, Abdul Khaliq, **Dr. Zaheer Hussain**, Dr. Nasir Ahmad and Dr. Muhammad Saleem Haider “Cost Effectiveness of Molecular Diagnosis of Meat Borne Pathogens” Foods Of Animal Origin” at University Of Agriculture Faisalabad (March 30-31st, 2017).
- **Dr. Zaheer Hussain**, Dr. Nasir Ahmad, Rabeel Asghar, Ayehsa Nisar, Qurat Ul ain Bukhari, Muhammad Iqrar and Dr. Muhammad Saleem Haider “*Poor meat hygiene practices in Lahore promote microbial growth in chicken*” 3<sup>rd</sup> International Conference on Safe Food of All at March 2-3, 2017 BZU, Multan
- Rabail Asghar, \***Dr. Zaheer Hussain**, Dr. Nasir Ahmad and Dr. Muhammad Saleem Haider "Meat borne pathogens: a serious concern for reducing quantity and quality of meat” presented in Conference on sustainable crop and animal production system December 8-10, 2016 University of Haripur, Khyber Pakhtunkhwa, Pakistan
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar Ul Ehasan Qureshi “High susceptibility of livestock to endemic rabies in Pakistan” accepted in RITA 27th International meeting October 23-28, 2016 in Belem, Brazil.

- Zafar Ul Ahsan Qureshi<sup>1</sup> and **Zaheer Hussain**, “Epidemiology of buffalo-pox Virus in Pakistan” 2nd INTERNATIONAL CONFERENCE ON ZONOSSES October 20-21 BZU, Multan.
- Invited lecture **Zaheer Hussain** and Zafar Ul Ehasan Qureshi “Viral zoonotic diseases practical experience on sample handling and diagnosis”. September 20-22, 2016 in training workshop on Diagnosis of Viral Diseases’ NIAB, Faisalabad.
- **Zaheer Hussain**<sup>1</sup>, Muhammad Saleem Haider<sup>1</sup> and Zafar Ul Ehasan Qureshi<sup>2</sup>, “Factors which Sharpens the Killer Bites of Rabies in Pakistan” accepted in “**Rabies in the Americas (RITA) 26<sup>th</sup> International Meeting**”, October 4-8, 2015 in Fort Collins, Colorado, USA.
- Delivered lecture “Viral zoonotic diseases practical experience on sample handling and diagnosis”. May 04-06, 2015 to the participants of training workshop *Diagnosis of Viral Diseases*’ NIAB, Faisalabad.
- Delivered lecture “Rabies Prevention and control with special reference to animals in Rabies awareness” to participants of one day seminar on rabies on 9<sup>th</sup> February, 2015 at UVAS, Lahore.
- Delivered lecture “Viral zoonotic diseases practical experience on sample handling and diagnosis”, November 17-20, 2014 to the participants of training workshop *Diagnosis of Viral Diseases*’ NIAB, Faisalabad.
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar Ul Ehasan Qureshi (2014) “Rabies situation in Pakistan” presented in 1<sup>ST</sup> INTERNATIONAL CONFERENCE ON ZONOSSES October 16-17, 2014 BZU, Multan.
- Zafar Ul Ahsan Qureshi, **Zaheer Hussain**, Dr. Rai Shafqat Ali Khan, Dr. Ijaz Mahmood and Dr. Muhammad Saleem Haider (2014) “Buffalo Pox Virus An Emerging Threat to Buffaloes and Human” Presented in 1<sup>ST</sup> INTERNATIONAL CONFERENCE ON ZONOSSES October 16-17, 2014 BZU, Multan.
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar Ul Ahsan Qureshi (2014), “A Serious Concern for National Food security: Low Milk Producing Animals” presented in 5<sup>th</sup> Int. Conf. on Agriculture, Food Security & Climate Change, Jointly organized by PAS-Forum and University of Poonch, Rawalakot, AJK on Sep 9-11, 2014:
- Zafar Ul Ahsan Qureshi, **Zaheer Hussain** and Muhammad Saleem Haider (2014) “BUFFALO POX VIRUS: AN EMERGING ZONOSIS” presented in International Conference on Stress Biology and Biotechnology Challenges & Management on May 21-23, 2014 at Institute of Agricultural sciences, University of the Punjab, Lahore.
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar ul Ahsan Qureshi (2014) “EMERGING AND REMERGING ZONOTIC DISEASES” presented in International Conference on Stress Biology and Biotechnology Challenges & Management on May 21-23, 2014 at Institute of Agricultural sciences, University of the Punjab, Lahore.
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar Ul Ahsan Qureshi, (2014) “Molecular Epidemiology Rabies in Pakistan” International Conference on Innovative Biological and Public Health Research (ibphr-2014), May 6-8, 2014:GC, University, Lahore.
- **Zaheer Hussain**, Muhammad Saleem Haider, Zafar Ul Ahsan Qureshi, and Charles Rupperchet “New Diagnostic Techniques and Molecular Epidemiology of Rabies Virus”, 7<sup>th</sup> Annual Conference of Pakistan Association of Pathologists (PAP) and 2<sup>nd</sup>

Joint Conference of Societies of Pathology, to be held December 20-22, 2013:at Pearl Continental Hotel, Lahore.

- **Zaheer Hussain** and Zafar Ul Ahsan Qureshi “Viral zoonotic diseases practical experience on sample handling and diagnosis”, December 17-19, 2013, lecture delivered in training workshop *Diagnosis of Viral Diseases*’ NIAB, Faisalabad.
- **Zaheer Hussain**, Muhammad Saleem Haider, Zafar Ul Ahsan Qureshi, and Charles Rupperchet (2013). “Importance of Molecular Biology for Control of Rabies” 11<sup>th</sup> Biennial Conference of Pakistan Society for Biochemistry and Molecular Biology held from November 25-28, 2013.at institute of biochemistry and biotechnology, university of the Punjab
- **Zaheer Hussain**, Muhammad Saleem Haider and Zafar Ul Ahsan Qureshi (2013) “Genetically Modified Rabies Vaccine: a Potential Candidate for Wild Life Rabies Vaccination in Pakistan” 33<sup>rd</sup> Pakistan Congress of Zoology (International) April 2-4, 2013, Islamabad.
- **Zaheer Hussain**, Muhammad Saleem Haider Zafar Ul Ehasan Qureshi, and Charles Rupperchet (2013) “RT-PCR: a Rapid Test for Anti-mortem and Post Mortem Diagnosis of Rabies” 10<sup>th</sup> ANNUAL CONFERENCE INFECTIOUS DISEASES SOCIETY OF PAKISTAN “Emerging Trends” A Society for Clinical Microbiology, Infectious Diseases and Public Health held from February 22-23, 2013 at **SKMCH**
- Muhammad Saleem Haider, **Zaheer Hussain**, Shahida Afzaal and Zafar Ul Ahsan Qureshi (2013) “Efficacy Test in Mice of Two Novel Rabies Vaccine Candidates Using a Pakistan Rabies Virus Glycoprotein Gene” presented at Ninth International Biennial Conference of Pakistan Society of Microbiology held from January 28 – 31, 2013 at Karachi.
- **Zaheer Hussain**, Muhammad Saleem Haider, Shahida Afzaal and Zafar Ul Ahsan Qureshi (2013) “Direct Rapid Immunohistochemical Test: a Quick, Cost effective and Easy to Use Diagnostic Test for Rabies” presented at Ninth International Biennial Conference of Pakistan Society of Microbiology held from January 28 – 31, 2013 at Karachi.
- Farzana Shaheen, Zafar Qureshi, Nahmood ul Hassan, **Zaheer Hussain**, Arfan Ahmad, Muhammad Zubair Shabbir, Freeha Akhtar, Masood Rabbani, Nadia Mukhtar, Tahir Yaqoob, Khawar Ali Shahzad (2013), “A surveillance for probable detection of rabies virus in wild animals” presented at Ninth International Biennial Conference of Pakistan Society of Microbiology held from January 28-31, 2013 at Karachi.
- Muhammad Saleem Haider, **Zaheer Hussain**, Zafar Ul Ahsan Qureshi, Xiang WU , and Charles Rupperchet (2012) Development of genetically recombinant rabies vaccine (Oral Presentation) 2<sup>nd</sup> World Congress on Virology August 20-22, 2012 Embassy Suites Las Vegas, USA.
- **Zaheer Hussain** and Zafar Ul Ahsan Qureshi (2011) “Isolation and Expression of Immunogenic Domains of Rabies Virus” on June 28, 2011 at Lahore Chamber and Commerce Industry.

#### **Conferences / Symposia / Workshops Organized**

- Organized 5th International/ 10th National Conference of Pakistan Phytopathological Society “Crop Protection for Sustainable Agriculture” November 23-25, 2015 at Institute of Agricultural sciences, University of the Punjab, Lahore.

- International Conference on Stress Biology and Biotechnology Challenges & Management from May 21-23, 2014: at Institute of Agricultural sciences, University of the Punjab, Lahore.
- Organized Cotton Leaf Curl Disease (CLCuD) Diagnostic & Resistance 3 Days Workshop August 26-28, 2013 at Institute of Agricultural Sciences, the University of the Punjab, Lahore.

#### **Conference/symposia/workshop/ training courses attended**

- Attended 7th National training workshop on “Advanced Imaging Techniques in Biological & Nano-sciences” NIBGE Faisalabad held from 16<sup>th</sup>-20<sup>th</sup> November, 2015.
- Training workshop “Development of Livestock and Dairy Sector” held from 20<sup>th</sup>-24<sup>th</sup> October, 2014 Peshawar.
- Training workshop Research Ethics, Endnote and Turnitin , 25-26 September, 2012 ,Department of Library Science and Information Technology, Punjab University, Lahore.
- 2<sup>ND</sup> Real Time PCR workshop held from September 4-7, 2012, University Institute of Biochemistry and Biotechnology PMAS Arid Agriculture University Rawalpindi.
- Training Workshop on Computational Biology and Bioinformatics held on 9-13 January 2012 at LUMS Lahore.
- Endnote Training Workshop on 24<sup>th</sup> December, 2011 held at University of Health Sciences, Lahore.
- Training workshop on Bioinformatics Applications in Biotechnology for Young Biotechnologist held from December 9-11, 2011 at Forman Christian College (A Chartered University), Lahore.
- An international symposium “Tuberculosis - Epidemiology, Diagnostics and Therapeutics” held on November 03, 2011 at Institute of Biochemistry and Biotechnology, Punjab University Lahore. (Attended)
- One day National Seminar on “The Awareness and Current Status of Rabies “ held on 28<sup>th</sup> July, 2011 at UVAS, Lahore. (Attended)
- One day Seminar entitled “The Awareness and Current Status of Rabies” at World Rabies Day on 28<sup>th</sup> September, 2010 held in Pearl Continental Hotel, Lahore. (Attended)
- A seminar entitled “Evolution of Bat Rabies in America” 26<sup>th</sup> May 2010 at CDC, Atlanta Georgia, USA. (Attended)
- A seminar entitled “Evolution of RNA Viruses” 28<sup>th</sup> April 2010 at CDC, Atlanta Georgia, USA (Attended).
- The workshop on “Separation Sciences and Omics” held on 4-6 April, 2009 at School of Biological Sciences, University of the Punjab, Lahore, Pakistan. (Attended)
- International Symposium on Health and Diseases held on May 27-29, 2008 at School of Biological Sciences, University of the Punjab, Lahore, Pakistan (Attended).
- Workshop: Biomarker Measurements in Complex Matrices held on April 25-26<sup>th</sup>, 2007 at School of Biological Sciences, University of the Punjab, Lahore, Pakistan (Attended)
- A Workshop on Current Status of Foot and Mouth Disease in Pakistan held in January 2007 at National Veterinary Laboratory, Islamabad.
- An International Symposium on emerging Viral Problems in Plants, Animals and Humans from 19-21 November 2006 at NIBGE, Faisal Abad.
- International Symposium on Nanochemistry of Enzymes held on September 20-21, 2006 at School of Biological Sciences, University of the Punjab, Lahore, Pakistan

- 26<sup>th</sup> Pakistan Congress of Zoology (International) held on 4-6 April, 2006 at Punjab University Lahore, Pakistan.
- “18th FAOBMB Symposium” held on 20-23rd November, 2005 at Lahore, Pakistan.

#### **Projects completed /Awarded**

1. Molecular Characterization of Foot and Mouth Disease in Pakistan
2. Validation of Fluorescent Antibody Test, RT-PCR and Mice Inoculation Test for Diagnosis of Rabies in Pakistan
3. Molecular Epidemiology of Buffalo Pox Virus Awarded by University of the Punjab.
4. Pre disposing Factors of Subclinical Mastitis submitted University of the Punjab.
5. Molecular identification of food borne pathogens on basis of ribosomal RNA

#### **Projects Submitted**

1. Molecular characterization and development of cell culture based vaccine against *buffalopox virus* Submitted under PARB CGS SYSTEM.

#### **Awards/ Honors**

- Gold Medalist in B.Ed (December, 2003) from Ali Institute of Education, Lahore.
- First time in Pakistan Sequence Full Length Genome of Rabies Virus
- Developed first genetically modified rabies virus vaccine in Pakistan.

#### **Membership of professional societies**

- Life member Pakistan Veterinary medical council
- Member American society of microbiology 2013-todate
- Member infectious diseases society of Pakistan
- Member Pakistan society of microbiology
- Member global alliance for rabies