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Rabia Kanwar

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Research Interest

My interest is to develop a treatment using bacteriophage and their endolysins against deadliest bacteria, which shows resistance toward conventional antibiotics.

Educational Qualification

- **PhD Microbiology** (2019- Thesis submitted) University of Agriculture Faisalabad, (CGPA: 3.87/4) research topic: **"Characterization and in-vitro evaluation of phages as antimicrobials against *Pseudomonas aeruginosa* isolated from burn wounds of human patients and hospital environment**"
- **M.Phil. Microbiology (**2016-2018**)** University of Agriculture Faisalabad, **(**CGPA: **3.84/4)** Thesis title **"Transcriptional Expression of CCL1, CCL2 and CCL3 in Immune cell mediated acute hepatitis in mice"**
- **BSc (Hons) Microbiology (**2012-2016) University of Agriculture Faisalabad, (CGPA: **3.82/4) Silver medalist on securing 2nd position**

Achievements and Award

- **Silver medal (2nd position**) for academic position in BSc (hons) Microbiology
- Received fully funded HEC indigenous scholarship for graduate studies.
- Received fully funded university Merit base scholarship throughout the studies (2012-2016)
- **2nd** position in poster competition at the 17th Annual Conference of the Medical Microbiology and infectious disease society of Pakistan, with topic "I**solation of phages against Pseudomonas aeruginosa isolated from burn patients**
- Received merit based Laptop award in 2012 and again in 2016

Research project completed

1) Undergraduate Project:

- **Prevalence and multidrug resistanceprofiles of several bacterial pathogens isolated from hospital inanimate surfaces in Faisalabad, Pakistan.**

I have completed this project during my undergraduate internship. During this period I have learned the conventional microbiological techniques of bacterial isolation and identification in hospital inanimate objects. We have isolated different bacteria including *P. aeruginosa, K, pneumonia*, *S. aureus*, coagulase negative Staphylococci, and *E. coli*. The antibiogram of these bacteria was performed using Kirby Bauer disc diffusion method. Results showed that Gram positive bacteria was more prevalent than Gram negative.

2) M.phil thesis project:

- **"Transcriptional expression of CCL1, CCL2 and CCL3 chemokines in immune cell mediated acute hepatitis"**

Here in this study chemokines group cc chemokines CCL1, CCL2 and CCL3 were investigated. Ten week old Balb/c (n=14) were taken. Three groups were treated with ConA and one group for vehicle control. PBS group show normal tissue and 4 hour tissue showed slight histopathological symptoms on the other hand 6 hour tissue showed severe damage and 24 hour tissue showed retrieval of Damage. Among selected chemokines (CCL1, CCL2 and CCL3), were further verified using RT-qPCR. In conclusion, this study showed that ConA induce hepatitis cause severe liver damage and stimulation and secretion of several chemokines. The increased level of studied chemokines CCL1, CCL2 and CCL3 levels during this infection strongly recommends their potency to use as biomarker in future studies.

3) Phage-antibiotic synergism against *Salmonella* Typhi isolated from stool samples of typhoid patients.

This study analyzed the partial characterization of isolated MDR *Salmonella typhi* phage named as ST-1. This phage was isolated using Agar-overly technique and then phage parameters like pH, thermal stability, electron microscopy and DNA isolation and restriction analysis was performed. Then In-vitro evaluation of these phage as alternative antibiotic was determined in synergism with antibiotic. The phage was co-administrated with CIP in a titration plate. The results have shown that lytic phages formed plaques on agar plates, the co-administration of bacteriophages and antibiotics was more successful than either alone, lowering the incidence of resistance.

4) Determination of antimicrobial, pH, bile salt, and gastric juice tolerance properties of Lactobacilli isolated from human milk.

This work was aimed to isolate, identify, and determine the probiotic potential of *Lactobacillus* bacteria from human milk. A total of 70 samples of human milk were collected from different lactating mothers. The milk samples were proceed for the isolation of bacteria on respective agars. The bacteria were identified based on their morphology, culture characteristics, and biochemical properties. Isolated bacteria were evaluated for probiotic properties in which, tolerance to acidic pH, bile salts, and gastric juice as well as antibacterial activity and antibiotic susceptibility were determined. The present work

proved the presence of beneficial bacteria in the human milk. Isolated Lactobacillus exhibited significant antibacterial activity against pathogenic bacteria, and tolerance to acidic pH, bile salt, and gastric juice. Therefore, human milk could be a good source of probiotics for infants.

5) PhD Project:

- "**Characterization and in-vitro evaluation of phages as antimicrobials against *Pseudomonas aeruginosa* isolated from burn wounds of human patients and hospital environment"**

The main objective of this study is to isolate Bacteriophage and determination of its antimicrobial activity against *P. aeruginosa* isolated form burn wounds and burn ward environment. *P. aeruginosa* was isolated and confirmed by using conventional microbiological laboratory practices. Multidrug resistance *P. aeruginosa* was confirmed. Then Bacteriophages was isolated against *P. aeruginosa* through the agar overlay method and lytic spectrum was determined through spot test. And naturally isolated phages now, proceed for characterization, including pH and temperature stability along with its DNA characterization**.** DNA was then sequence with illumine. And genomic analysis was performed. In genomic analysis I used tools RAST, Proka, for annotation and assembly, then phylogenetic analysis was performed using MEGA 11 software.

Experience

1) Teaching assistant (Microbiology) 16-09-2022 to 12-01-2022
University of agriculture Faisalabad
Subjects teach: Viruses of Bacteria, Quality control practices
2) Internship 03-2016 to 05-2016

Faisalabad Institute of cardiology (Hospital)

During this internship I have learned basic techniques of Microbiology lab for bacterial isolation, Antibiotic Resistance and infectious disease epidemiology.

3) Internship 07-2015 –08-2015

District head Quarter hospital Faisalabad
During this internship I worked in hepatitis section, where I performed PCR and ELISA tests mainly to evaluate the burden of hepatitis in my Faisalabad city.
4) Lecturer Biology 07- 2019 to 12- 2020
Logic group of College Khurrianwala.

Seminars and workshops Attended

- Investigation of Circulatory Liver-Specific MicroRNA's as non-invasive diagnostic biomarker Of Hepatitis: A novel diagnostic tool
- International Seminar on Poultry Disease, Diagnosis and Prevention
- 2nd International Conference on Biochemistry, Biotechnology and Biomaterials
- Workshop on Isolation and characterization of bacteriophage for Phage therapy
- One day workshop on " Primer designing, PCR Optimization, Phylogenetic analysis, and its application in biomedical sciences

- One day international workshop on Computer aided development of antimicrobial agents
- One day national workshop hands on training on basic tools of bioinformatics for molecular biology and biomedical research
- Two-Day workshop on scientific writing held at university of Agriculture Faisalabad.

Abstract Presentation

- Isolation of phages against *Pseudomonas aeruginosa* isolated from burn patients **(2nd position)**
- Isolation of bacteriophages against methicillin resistance *Staphylococcus aureus* isolated from mobile phones

Research experience

- Isolation and Biochemical characterization of bacteria from different aspects of Hospital.
- RT-PCR for the detection of Liver Chemokine CCL1, CCL2, CCL3 and CCL4 as the early detection of acute hepatitis
- Isolation of Bacteriophages against Antibiotic resistance Bacteria.
- Genomic Analysis, NGS, phylogenetic analysis
- R software

Book chapter:

Title	**Index and Impact factor**
Kanwar R, Nawaz A, Ullah K, Mehmood Z, Ali S, Farzand I, Aslam MA, Fatima F, Javed R and Tajamal M, 2023. **Antibiotic resistance from zoonotic point of view and possible alternative treatments**. In: Altaf S, Khan A and Abbas RZ (eds), Zoonosis, Unique Scientific Publishers, Faisalabad, Pakistan, Vol 4: 202-213. https://doi.org/10.47278/book.zoon/2023.148).	Google scholar IF= N/A
Nayab S, S Khan, A Mehmood, K Rehman, AN Khan & R Kanwar, 2023. **Potential use of garlic for control of drug-resistant bacteria.** In: Complementary and Alternative Medicine: One Health Perspective (Sindhu ZuD, B Aslam, U Uslu & MMohsin, eds): FahumSci, Lahore, Pakistan, pp: 56-62. ISBN: 978-627-7745-01-1	Google scholar IF= N/A

Published Paper:

Title	**Index and Impact factor**
1: Kanwar, R., Aslam, M. A., Zulqurnain, H., Qadeer, A., Ali, S., Nayab, S., & Mustafa, S. (2023). **Bacteriophages and Their Endolysin: An Alternative Therapeutic Approach for Bovine Mastitis**. *Biology Bulletin Reviews*, *13*(4), 326-335.	Springer (Q4) IF= 0.1
2. Ali, S., Aslam, M. A., Kanwar, R., Mehmood, Z., Arshad, M. I., &	Springer (Q3) IF= 2.1

Hussain, S. (2023). **Phage-antibiotic synergism against Salmonella typhi isolated from stool samples of typhoid patients.** *Irish Journal of Medical Science (1971-)*, 1-8.	
3. Qaisar, M. U., Aslam, M. A., Ullah, K., Kanwar, R., Ali, S., Farzand, I., ... & Hussain, A (2023). **Occurrence and antimicrobial profiling of K. pneumoniae in burn patients at burn ward, Allied Hospital, Faisalabad.** *Pakistan Journal of Medical & Health Sciences*, *17*(02), 137-137.	Google scholar HEC recognized IF= 0.1
4. Nayab, S., Aslam, M. A., Sajid, S., Zafar, N., Razaq, M., & Kanwar, R. (2022).**A Review of Antimicrobial Peptides: Its Function, Mode of Action and Therapeutic Potential.** *International Journal of Peptide Research and Therapeutics*, *28*(1), 1-15.	Springer (Q3) IF= 2.5
5. Kanwar, R., Fatima, R., Kanwar, R., Javid, M. T., Muhammad, U. W., Ashraf,Z., & Khalid, A. (2021). **Biological, physical and chemical synthesis of silver nanoparticles and their non-toxic bio-chemical application: A brief review.** Pureand Applied Biology. Vol. 11, Issue 2, pp418-435.*Pure and Applied Biology (PAB),* Accepted: 29/05/2021 (as a corresponding author)	Google scholar HEC recognized IF= N/A
6. Kanwar, R. (2021). **Emergence of Mucormycosis: A Therapeutic Challenge for COVID-19 in Pakistan.** *Saudi J Pathol Microbiol*, *6*(10), 363-368. (as a corresponding author)	Google scholar HEC recognized IF= 0.66
7. Zaib, H., Kanwar, R., Zafar, N., & Ali, S. (2019). **Prevalence and multidrug resistanceprofiles of several bacterial pathogens isolated from hospital inanimate surfaces in Faisalabad, Pakistan.** *Novel Research in Microbiology Journal*, *3*(6), 526-534.	Google scholar HEC recognized IF= 1.3
8. Zafar, N., Nawaz, Z., Anam, S., Kanwar, R., Ali, A., Mudassar, M., Javid, M.T., Zafar, A, and Tariq, A., 2020. 31. **Prevalence, molecular characterization and antibiogram studyof Listeria monocytogenes isolated from raw milk and milk products.** *Pure and Applied Biology (PAB)*, *9*(3), pp.1982-1987.	Google scholar HEC recognized IF= N/A
9. Abbas, A., Kanwar, R., Aslam, B., Bilal, M., Yaseen, K., Ali, A., ... &	Google scholar (Q3)

Zafar, N. (2021).**Determination of antimicrobial, pH, bile salt, and gastric juice tolerance properties of Lactobacilli isolated from human milk.** *International Food Research Journal*, *28*(2), 302- 308.	HEC recognized IF= 1.169
10. Zafar, N., Aslam, M.A., Ali, A., Khatoon, A., Nazir, A., Tanveer, Q., Bilal, M., Kanwar, R., Qadeer, A., Sikandar, M. and Zafar, A., 2020. **Probiotics: Helpful for the prevention of COVID-19?.** *Biomedical Research and Therapy*, *7*(11), pp.4086-4099.	Google scholar HEC recognized IF= N/A
11. Zafar, N., Kanwar, R., Ali, A., Qadeer, A., Zafar, A., Nasir, H.,Mehreen, U.,2020. Effects of Probiotics on Health. *International Journal of Biosciences, 16(5),* pp.35-46	Google scholar HEC recognized IF= N/A
12. Zafar, A., Zafar, N., Kanwar, R., Mazhar F., Shaukat, M., Sarwar, M., Afzal A., 2020.**Detection and molecular characterization of Metallo betalactamases producing Pseudomonas aeruginosa isolated from burn patients.** *International Journal of Biosciences, 16(3),* pp.454-463.	Google scholar HEC recognized IF= N/A
13. Qadeer, Azka, Ashiq Ali, Nishat Zafar, Rabia Kanwar, Sidra Altaf, Muhammad Bilal, Sana Fatima, Mehak Gul, and Ghaniya Arif Ahmed. "53. **Therapeutic potential of bacteriocin like inhibitory substances against different disease conditions."** *Pure and Applied Biology (PAB)* 10, no. 4 (2021): 1484-1493.	Google scholar HEC recognized IF= N/A
14. Nayab, S., ur Rahman, S., Sajid, S., Abbas, M. I., Idrees, M., Tariq, M. U., ... & Farzand, I. (2021). **Efficacy of Allicin against multi-drug resistant Escherichia coli recovered from potable water.** Pure and Applied Biology. Vol. 11, Issue 2, pp505-513.	Google scholar HEC recognized IF= N/A

Referee

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