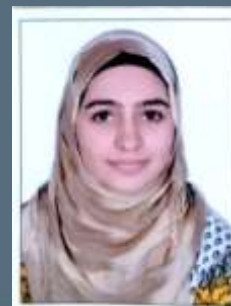


INSHA SULTAN

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Research work

ICMR postdoctoral Research Associate at Jamia Hamdard, New Delhi, India, project entitled, *Molecular characterization of alternatively spliced novel isoforms of human genes linked to Mycobacterium tuberculosis (Mtb) infection.*

ICMR postdoctoral Research Associate/SRF at Jamia Millia Islamia (JMI), New Delhi, India, and project entitled, *A study on the role of genetic factors in acquisition and dissemination of CTX-M type β -lactamase gene among bacteria.*

Ph.D, Microbiology Research Lab, Jamia Millia Islamia (JMI), New Delhi, India. Thesis submitted in January 2020 and awarded in July 2020.

Supervisor: Prof. Qazi Mohd. Rizwanul Haq. Head department of Biosciences, Faculty of Natural Sciences, Jamia Millia Islamia (JMI), New Delhi, India

Thesis Title: A study on the genetic factors associated in acquisition and dissemination of CTX-M type β -lactamase gene among bacteria.

Honors and Awards

- Postdoctoral Research Associate, Indian Council of Medical Research (ICMR, 2022), New Delhi, India.
- Postdoctoral Research Associate, Indian Council of Medical Research (ICMR, 2020), New Delhi, India.
- Senior Research Fellow, Indian Council of Medical Research (ICMR, 2018), New Delhi, India.
- Travel Grant for attending FEMS-2023 conference, funded by Science and Engineering Research Board (SERB), India.
- Travel Grant for attending FEMS-2019 conference, funded by Department of Biotechnology, (DBT/CTEP), India.
- Qualified GATE-2015 in Life sciences.
- Best Poster Awards:
 1. NCRABS-2020, Department of BioSciences, Jamia Millia Islamia, New Delhi, India, March.5.
 2. DBT, Biotechnology popularization programme, Miranda House, New Delhi, India, Aug.20.

Teaching Experience

Master Level: Subject taught M.Sc. Microbiology (General Microbiology) and Practical classes with my supervisor for the subject of Microbiology for M.Sc. Biosciences, Biochemistry and Microbiology.

Assisted Master's Students with their dissertation projects.

Research statement

I started my research career in Prof. Qazi. Mohd Rizwanul Haq's Microbiology Research lab at Jamia Millia Islamia, New Delhi, India in October, 2014. The title of my PhD thesis is "A study on the genetic factors associated with acquisition and dissemination of CTX-M type β -lactamase gene among bacteria". This work was carried out to investigate the occurrence of antibiotic resistance genes (ARGs), heavy metal resistance genes (HMRGs) and mobile genetic elements (MGEs) from the Dal Lake and Wular Lake (Asia's largest fresh water Lake) in Kashmir valley, India which provides an insight of Lake Ecosystem as hotspots for MDR isolates. Given below are some of the points which were addressed during the course of my PhD thesis.

- Detection of ESBL genes, MGEs, HMRGs, from Dal Lake and Wular Lake from Kashmir valley, in *Bacillus simplex* and *Brevibacterium frigoritolerans* are the first reports from India. (Sultan, I., et al, 2020. *Sau. J. Biol.Sci. Elsevier*, doi: <https://doi.org/10.1016/j.sjbs.2020.06.002>)
- This is the first study of antibiotic and heavy metal resistance genes from the Dal Lake and Wular Lake (Asia's largest fresh water Lake) of Kashmir Valley, India.

- New study of ARG, HMRG & MGE in *E.coli*, *Aeromonas*, *Pseudomonas*, at Dal & Wular Lake
- First report of CTX-M-15, IntI, SulI & SilE in *Brevibacterium frigoritolerans*
- It is new report of CTX-M-100, AmpC & SulI in *Atlantibacter hermannii*
- CTX-M-15-ISEcp1-orf477 in *E.coli* & *Aeromonas* sp. is new report from Kashmir India
- Arg299Leu mutation in ISEcp1 decreased hydrogen bonds between *bla*CTX-M-15 & ISEcp1 (Sultan, I., et al, 2022. *Science of the Total Environment*. Elsevier, <https://doi.org/10.1016/j.scitotenv.2022.154221>).
- Detection of mobile elements like integron (IntI), insertion sequence (Isecp1), transposons (TN3, TN21) is done for the first time.
- Occurrence of drug resistance determinants *bla*TEM, *AmpC*, *qnrS* and heavy metal resistant genes *merB*, *merP*, *merT*, *silE*, *silP*, *silS* and *arsC* among ESBL positive bacterial isolates from Lake Ecosystem of Kashmir valley, India has been studied for the first time.
- Acknowledging the significance of the wetland for its biodiversity and socio economic values; Wular Lake was identified as a Wetland of international importance under Ramsar Convention in 1990.
- It is an important fish habitat that makes up a significant part of the diet for local population. It acts as a water basin of the mountains surrounding Himalayas.
- Dal Lake is known for its tourist attraction and floating vegetable market it also provides drinking water, fish and recreational satisfaction to locals and tourists.
- With no baseline data available on the resistance profile of bacterial inhabitants from these lakes, active surveillance and epidemiological studies are imperative.

The main objectives of the PhD thesis included to study the role of aquatic environment in dissemination of drug resistance determinants and analysis of genetic environment of ESBL genes.

*ESBL: Extended spectrum β -lactamase gene.

Education

2014

Master of Science (M.Sc.)

Hamdard University, Delhi, India

A first class masters degree in **Biochemistry**.

2012

Bachelor of Science (B.Sc.)

Kashmir University, Jammu & Kashmir, India

A first class bachelor's degree in **General Science**

2009

Intermediate (C.B.S.E)

J.N.V Baramulla, Jammu & Kashmir with 74% marks.

2007

Matric (C.B.S.E)

J.N.V Baramulla, Jammu & Kashmir with 81.6% marks.

Technical Skills

Molecular Biology: Gene Cloning, Cell culture, PCR, RT-PCR, Gel Electrophoresis, SDS-PAGE, DNA/RNA isolation, Plasmid isolation.

Microbiology: Isolation and identification of bacteria, Maintenance of bacterial cultures, staining, Preservation of bacteria, Antibiotic susceptibility tests, Microscopy.

Biochemistry: Chromatography (Column and Gel filtration), Western Blotting.

Bioinformatics: Molecular Dynamics Simulation, Molecular Modelling and Docking, Bioedit, Blast, Clustal w, Pymol.

Computers: MS-Word, MS-Excel, MS-PowerPoint

Professional Affiliation

June, 2022 to present

Indian Council of Medical Research (ICMR-RA), Jamia Hamdard, New Delhi, India.

July, 2020-2021

Indian Council of Medical Research (ICMR-RA), Jamia Millia Islamia, New Delhi, India.

July, 2018-2020

Indian Council of Medical Research (ICMR-SRF), Jamia Millia Islamia, New Delhi, India.

October, 2014-2021

Ph.D student at Department of Biosciences, Jamia Millia Islamia, New Delhi, India.

Work Experience

Oct, 2014-July, 2020 Ph.D.

Ph.D. Thesis entitled "A study on the genetic factors associated in acquisition and dissemination of CTX-M type β -lactamase gene among bacteria." under the supervision of Prof. Qazi Mohd. Rizwanul Haq. Department of Biosciences, Jamia Millia Islamia, New Delhi -110025.

2013-2014 Project Training

Hamdard University, New Delhi, India.

M.Sc. Dissertation I- "Studies on the expression of green fluorescent protein gene and molecular biology techniques"

M.sc dissertation II- "Isolation, purification and characterization of ovalbumin from hen egg and to develop antibodies against it"

Publications

- **Sultan, I.**, Siddiqui, M.T., Gogry, F.A., Haq, Q.M.R. (2022). Molecular characterization of resistance determinants and mobile genetic elements of ESBL producing multidrug-resistant bacteria from freshwater lakes in Kashmir, India. *Sci. Total Environ.* <https://doi.org/10.1016/j.scitotenv.2022.154221>
- Jahan, A., Masood, S., **Sultan, I.**, Zafar, F., Alam, M., Ghosal, A ... (2023). Fabrication of agro by-product derived green polyurea coatings with zero-VOC to combat corrosion and bacterial growth: A clean approach. *Journal of Cleaner Production.* 397, 136454.
- Gogry, F.A., Siddiqui, M.T., **Sultan, I.**, Husain, F.M., Al-Kheraif, A.A., Ali, A., Haq, Q.M.R. (2022). Colistin Interaction and Surface Changes Associated with mcr-1 Conferred Plasmid Mediated Resistance in *E. coli* and *A. veronii* Strains. *Pharmaceutics.* 14 (2), 295.
- **Sultan, I.**, Ali, A., Gogry, F.A., Rather, I.A., Sabir, J.S.M., Haq, Q.M.R. (2020). Bacterial isolates harboring antibiotics and heavy metal resistance genes co-existing with mobile genetics elements in natural aquatic water bodies. *Sau. J. Biol.Sci.* 27(10):2660-2668. doi: <https://doi.org/10.1016/j.sjbs.2020.06.002>.
- AlSheikh, H.M., **Sultan, I***, Rather, I.A., AlSheikh, H., Jan, A.T and Haq Q.M.R. (2020). Antibiotic Resistance: A Prospective study of plant based Phytochemicals as alternative to antibiotics in combating bacterial drug resistance. *Antibiotics.* 4; 9(8):E480. doi: 10.3390/antibiotics9080480. (*Equal contribution)
- **Sultan, I.**, Rahman, S., Jan, A.T., Siddiqui, M.T., Mondal, A.H., and Haq Q.M.R. (2018). Antibiotics, Resistome and Resistance Mechanisms: A Bacterial Perspective. *Front. Microbiol.* 9:2066. doi: 10.3389/fmicb.2018.02066. @[Featured as article of interest by *PLOS Antimicrobial Channel, 2018*].
- Gogry, F.A., Siddiqui, M.T., **Sultan, I.** and Haq, Q.M.R. (2021). Current update on intrinsic and acquired colistin resistance mechanisms in bacteria. *Frontiers in Medicine,* 1250. doi: 10.3389/fmed.2021.677720.
- Ali, A., **Sultan, I.**, Mondal, A.H., Siddiqui, M.T., Gogry, F.A. and Haq, Q.M.R. (2021). Lentic and effluent water of Delhi-NCR: a reservoir of multidrug-resistant bacteria harbouring bla CTX-M, bla TEM and bla SHV type ESBL genes. *Journal of Water and Health.* doi: 10.2166/wh.2021.085
- Siddiqui, M.T., Mondal, A.H., **Sultan, I.**, Ali, A., and Haq, Q.M.R. (2018). Co-occurrence of ESBLs and silver resistance determinants among bacterial isolates inhabiting polluted stretch of river Yamuna, India. *Int J of Env Sci and Tech.* <https://doi.org/10.1007/s13762-018-1939-9>.
- Mondal, A. H., Siddiqui, M.T., **Sultan, I.**, and Haq Q.M.R. (2018). Prevalence and diversity of blaTEM, blaSHV and blaCTX-M variants among multidrug resistant *Klebsiella spp.* from an urban riverine environment in India, *Int J of Env Heal Res.* doi: 10.1080/09603123.2018.1515425.

Book Chapters Published

- **Sultan, I., and Haq, Q.M.R.** (2022). Bacterial Mechanisms for Metal (loid) s Remediation. *Bioremediation of Toxic Metal (loid)s*, CRC Press

Conferences & Abstracts Published

- **Sultan, I.,** Ali, A., Gogry, F. A., Haq, Q.M.R. (2020). A study on the association and localization of ESBL and heavy metal genes along with mobile genetic elements from natural aquatic environment. NCRABS-2020, Department of BioSciences, Jamia Millia Islamia, New Delhi, India, March.5. (**Best poster award with cash prize**)
- **Sultan, I,** Haq, Q.M.R. (2019). A study of ESBL genes in association and localization with mobile genetic elements among bacteria from natural aquatic environment. (*Accepted for presentation at 8th Congress of European Microbiologists (FEMS 2019), July 7-11 Glasgow Scotland*).
- **Sultan, I.,** Ali, A., Gogry, F. A., Haq, Q.M.R. (2019). A study of ESBL genes in association with mobile genetic elements from natural aquatic environment. DBT, Biotechnology popularization programme, Miranda House, New Delhi, India, Aug.20. (**Best poster award with cash prize**).
- **Sultan, I.,** Ali, A., Gogry, F. A., Haq, Q.M.R. (2018). ESBL producing bacterial isolates and their prevalence in natural aquatic environment of Jammu & Kashmir. Biophysika, Centre for interdisciplinary research in Basic Sciences, Jamia Millia Islamia, New Delhi, India, Nov. 20.
- **Sultan, I.,** Ali, A., Gogry, F. A., Haq, Q.M.R. (2018). A study on the association and localization of ESBL genes on mobile genetic elements among bacteria from natural aquatic environment. 59th Annual conference of Association of Microbiologists of India (AMI-2018) & International Symposium on Host-Pathogen Interactions University of Hyderabad, India, Dec. 09-12.
- **Sultan, I,** Haq, Q.M.R. (2017). Antibiotic resistance on rise among bacterial isolates from pristine lakes of Jammu & Kashmir. National seminar on Recent Advances in Environmental Toxicology, Department of Biosciences, Jamia Millia Islamia, New Delhi, India, Feb 13-14.
- Gogry, F.A., **Sultan, I.,** Ali, A., Haq, Q.M.R. (2019). Occurrence of mobile colistin resistance gene mcr-1 among bacterial isolates from aquatic environment in Delhi, India. 60th Annual conference of Association of Microbiologists of India (AMI-2019) Central University of Haryana, India, Nov.15-18.
- Ali, A., **Sultan, I., Gogry, F. A.,** Haq, Q.M.R. (2018). Prevalence of blaCTX-M type ESBL producing isolates of bacteria in aquatic environment of Delhi-NCR. 59th Annual conference of Association of Microbiologists of India (AMI-2018) & International Symposium on Host-Pathogen Interactions University of Hyderabad, India, Dec 09-12.
- Mondal, A.H., **Sultan, I.,** Haq, Q.M.R. (2017). High prevalence of blaTEM type ESBL among *Klebsiella* isolates from River Yamuna. National seminar on Recent Advances in Environmental Toxicology, Department of Biosciences, Jamia Millia Islamia, New Delhi, India, Feb 13-14.
- Siddiqui, K., Azam, M., Mondal, A.H., **Sultan, I.,** Haq, Q.M.R. (2016). Pattern and persistence of ESBL positive bacteria in Delhi stretch of river Yamuna. International conference on Emerging Trends in Biomedical Sciences, Aligarh Muslim University, Aligarh, India, March 6-8.
- Mondal, A.H., **Sultan, I.,** Haq, Q.M.R. (2015). Efficient biosynthesis of silver nanoparticles using *Aeromonas dhakensis* and their antibacterial activity against ESBLs producing waterborne pathogens. 6th World Congress on Biotechnology, New Delhi, India, October 5-7.

Training & Workshop

AICTE sponsored one week short term training programme on “**Practical Approaches for Next Generation Sequencing Technology and Data Analysis towards health care**” jointly organized by Department of Biotechnology, K .S. Rangasamy college of Technology, January 18-23, 2021 (Slot-3).

Author work shop on “**Getting Published in the Digital Age**” jointly organized by Dr. Zakir Husain Library, JMI and Taylor & Francis Group October 11th, 2017.

Author Workshop on “**Scholarly Writing & Intellectual Ethics**” jointly organized by Dr. Zakir Husain Library, JMI & Elsevier, September 26th, 2017.

Symposium on “**Flow Cytometry: Single Tool for Versatile Applications**” organized by ThermoFisher Scientific held at Department of Biosciences, JMI, New Delhi, September 25th, 2017.

Certification Courses

- NTPEL online certification course in the subject of **Immunology** Jul-Oct 2021 (12 week course) conducted by **Indian Institute of Technology (IIT) Khragpur** funded by the Ministry of HRD, Govt. of India .
- NTPEL online certification course in the subject of **Animal Physiology** Jul-Oct 2021 (12 week course) conducted by **Indian Institute of Technology (IIT) Khragpur** funded by the Ministry of HRD, Govt. of India .

Personal Information

Name: Insha Sultan
Date of Birth: 05 March, 1991
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Father's Name: Mohd Sultan Chopan
Mother's Name: Shaha Begum
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Languages Known: English, Hindi, and Urdu.
Permanent Address: House No. 71, Janwara Sopore, Baramulla, Jammu & Kashmir, India
Passport Number: W9110285

Declaration

I hereby declare that the information mentioned herein is true to the best of my knowledge and belief.

Place: New Delhi

Insha Sultan

Reference

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