

Sara Bibi - Curriculum Vitae

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About Me

- Early Career Professional
- Ambitious to join an academic organization and serve it with excellence while improving my professional practices of teaching and research.
- Affiliation and work experience with
 - [Women University Sawabi](#), Departments of Microbiology and Medical Laboratory Technology, teaching five courses as a visiting faculty since September, 2025.
 - [Environmental' Omics Lab](#), Mazumdar-Shaw Advanced Research Centre, University of Glasgow, UK → worked as a visiting PGR; activities included training in state-of-the-art Omics technologies to conduct microbial dataset analyses for my PhD project, 2022 (Feb-Aug).
 - [BINGO](#) (Bacteria, Immunology, Nutrition, Gastroenterology and OMICS) Group, University of Glasgow, UK → worked as a visiting PGR; determination of gut microbial metabolites (SCFA) for my PhD project, 2022 (Feb-Aug).
 - [Human Genomics and Proteomics Group](#), Department of Biosciences, COMSATS University Islamabad, Pakistan → worked as a PGR; genotyping of selected genes for SNPs, performing assays for biochemical markers as part of my PhD project (2021-2023).
 - [Environmental Toxicology Laboratory](#), Department of Biosciences, COMSATS University Islamabad, Pakistan → worked as a PGR; investigating drinking water fluoride exposure pathways for my PhD project (2020-2021).
 - [Microbiology and Public Health Laboratory](#), Department of Biosciences, COMSATS University Islamabad, Pakistan → worked as a PGR; microbial culturing and molecular identification as part of PhD training (2019-2020).
 - [Plant Cell Culture Laboratory](#), Department of Biotechnology, Quaid-i-Azam University, Islamabad, Pakistan → worked as a graduate researcher; callus production system for commercially important medicinal plant species (2012-2013).
 - [Environmental/Plant Biotechnology Laboratory](#), Department of Biotechnology and Genetic Engineering, Kohat University of Science and Technology, Pakistan → worked as an undergraduate researcher; abiotic stress impacting plant growth (2009-2010).

Education

- **Ph.D. (split-site PhD): 2018-2024 'Microbiology and Immunology'**
 - COMSATS University Islamabad, Pakistan (Host; Degree awarding institution; Student ID: SP18-PMI-006@isbstudent.comsats.edu.pk)
 - University of Glasgow, UK (Co-host; Student ID: 2819336b@student.gla.ac.uk)
 - Thesis: Health Impacts of Fluoride Over-exposure in Pakistani Population Groups.
 - Grade: A (CGPA : 3.61)

- Supervisors: [Prof. Dr. Syed Muhammad Nurulain](#) (Lead) and [Dr. Umer Zeeshan Ijaz](#) (UoG)
- **M.Phil: 2011 – 2013 ‘Biotechnology’**
 - Quaid-i-Azam University, Islamabad, Pakistan
 - Thesis: Effects of cold-pretreatment on callus induction and anti-oxidant activities in callus culture of *Silybum marianum* L.
 - Plant Cell Culture Laboratory, Department of Biotechnology, Quaid-i-Azam University Islamabad.
 - Grade A (CGPA 4/5)
 - Supervisor: [Assoc. Prof. Bilal Haider Abbasi](#)
- **BSc. Hons: 2006 – 2011 ‘Biotechnology & Genetic Engineering’**
 - Kohat University of Science and Technology, Pakistan
 - Thesis: Effect of Salt (NaCl) stress on physiological and biochemical characteristics of rice (*Basmati-385*).
 - Division 1st.
 - Supervisor: [Prof. Dr. Muhammad Jamil](#)

Publications

1. Bibi, S., Kerbiriou, C., Mckirdy, S., Kostytsia, A., Rasheed, H., Eqani, S. A. M. A. S., ... & Ijaz, U. Z. (2024). Gut microbiome and function are altered for individuals living in high fluoride concentration areas in Pakistan. *Ecotoxicology and Environmental Safety*, 284, 116959.
2. Bibi, S., Habib, R., Shafiq, S., Abbas, S. S., Khan, S., Eqani, S. A. M. A. S., ... & Nurulain, S. M. (2023). Influence of the chronic groundwater fluoride consumption on cholinergic enzymes, *ACHE* and *BCHE* gene SNPs and pro-inflammatory cytokines: A study with Pakistani population groups. *Science of The Total Environment*, 880, 163359.
3. Jamil, M., Bashir, S., Anwar, S., Bibi, S., Bangash, A., Ullah, F., & Rha, E. S. (2012). Effect of salinity on physiological and biochemical characteristics of different varieties of rice. *Pak. J. Bot*, 44(1), 7-13.

In Pipeline:

- Fluoride exposure and Cardiovascular risk: The role of Oxidative stress, Lipid alterations and Genetic susceptibility
- Pathophysiological insights of the chronic groundwater fluoride exposed subjects along the study of genetic vulnerability with *IBSP* rs114009564 in Pakistan.

Skills

Field Work: Experienced in scientific sampling using methodical and scientific approaches; Knowledge of regulatory guidelines and ethics in Pakistan; I have been actively engaged in water, blood, stool and urine collection and questionnaire acquisition for fluoride-related work as part of my PhD experimental research, which involved visiting the fluorosis-endemic regions of Pakistan.

Experienced in maintaining greenhouse cultivation of treated plants using water culture, sand culture and pot culture methods.

Dry Lab: I have been affiliated with *Environmental Omics Lab*, University of Glasgow through a split PhD program, and have been taking part in training sessions offered by Dr. Ijaz on multivariate microbial community analyses using numerical ecology and machine learning principles. The teaching material came

from 100 hours Metagenomics (BIOL 5172) module that he previously taught at University of Glasgow as part of the *MSc in Bioinformatics, Polyomics and Systems Biology*. I have used this knowledge and experience in the upcoming publications associated with my PhD. Summary of analytical techniques include and not limited to: processing 16S rRNA amplicons data using QIIME2 on high performance computing cluster; diversity analyses, stability analyses; analytical techniques for microbial community assembly mechanisms; differential analyses, regression modeling; and questionnaire analyses (risk ratio) using log binomial, poisson, and contingency analyses.

Wet Lab:

Microbial: Sterilization and Disinfection, Media preparation, Culture methods, Gram staining and Microscopy, Biochemical testing, Antibiotic susceptibility test, Heavy metal MIC determination, DNA extraction, Gel electrophoresis, NanoDrop spectrophotometer, Species-specific PCR, PCR for antibiotic resistance genes, Screening of Integrons by PCR-RFLP method, rep-PCR of *Lactobacillus* isolates, Exopolysaccharide extraction, Bacterial immobilization & stability in sol-gel, Preparation of Bacterial whole cell supernatant & lysate, Microencapsulation of bacteria, Viability assays of hydrocolloid beads, PCR based screening of T6SS in *C. jejuni*, Glass bead biofilm assays, Bradford assay for protein quantification, Vertical SDS-PAGE system, Coomassie blue staining, RAPD based typing of *C. jejuni* etc.

Molecular Biology: DNA extraction from whole blood, PCR-RFLP, TETRA-ARMS PCR, Genotyping of *ACHE*, *BCHE*, *GSTP1*, *GSTT1*, *GSTM1*, *SOD1*, *IBSP* genes for SNPs. Fecal DNA extraction, Qubit fluorometer, Preparing samples for 16SrRNA gene amplicon sequencing.

Biochemical Assays: Spectrophotometric determination of serum antioxidant enzymes activities, activities of esterases, liver function enzymes, pancreatic function enzymes, lipids profiling, creatinine, BUN, MDA & calcium determination, ELISA for CRP, Insulin, Adiponectin, IL-1 β , IL-6, TNF- α , Short chain fatty acids quantification through GC-FID.

Plant Biotechnology: *In vitro* seed germination, Callus induction frequency, Aseptic transfer of explants, Subculturing, Elemental analysis of plants, Photosynthetic pigment concentrations, Determination of protein content, Protease activity assay, Superoxide dismutase activity assay, Peroxidase activity assay, Determination of total phenolics & total flavonoids, DPPH assay.

Software and tools: Data analysis using IBM SPSS, GraphPad Prism and R studio.

Professional Development, Training and Invited Talks

- **Invited Speaker;** “*Health impacts of Fluoride over-exposure in Pakistani population groups*”, in the 1st International Hybrid Symposium on Applications of OMICs Technologies in Health and Disease (2024) organized by the Department of Biosciences, COMSATS University Islamabad.
- Participated in virtual workshop (2023) on “Pathways to collaborative networking series for Project Investigators: *Understanding microbial communities through in situ omics data synthesis –New developments*” organized by Environmental Omics Lab, University of Glasgow and Microbiology and Public Health Laboratory, Department of Biosciences, COMSATS University Islamabad.
- **Invited Speaker;** “Comparative SCFAs analysis of high fluoride exposed and control gut samples” presented in virtual meeting of BINGO Group, University of Glasgow (August, 2022).
- Participated in virtual workshop (2021) on “*Computational Chemistry; Structural Bioinformatics & Chemoinformatics*” organized by Scientific Pakistan, IT Sarkar.
- Participated in **Hands-on** Workshop (2020) on Microbial identification based on Advanced Molecular

Techniques at NIGAB, NARC Islamabad, Pakistan.

- Participated in Hands-on-training Workshop (2019) on NGS Data Analysis: Genome Assembly, RNASeq, Data Analysis in R, at CEME Rawalpindi, Pakistan.
- Participated in Biosymposium 2019: Workshop on Advanced NMR Techniques in Structural Biology and Chemistry at Department of Biology, LUMS, Pakistan.
- Participated in the international workshop on “Medicinal Plants: Conservation & Sustainable Use 2011” at Quaid-i-Azam University, Islamabad, Pakistan.
- Participated and **won 2nd Prize** in “Research Poster Exhibition 2011” at Department of Chemistry, Kohat University of Science and Technology, Pakistan.

Awards and Funding

- Award of scholarship (2018) under “Prime Minister’s Fee Reimbursement Scheme for Less Developed Areas (Selected Regions)” for the 4 years of PhD through Higher Education Commission of Pakistan.
- Award of 6 months scholarship under “International Research Support Initiative Program” granted by Higher Education Commission of Pakistan [No. 1-8/HEC/HRD/2021/11509] for University of Glasgow, UK ~£6250
- Got funding support by the Excellence project PrF UHK 2216/2023-2024 and University of Granada, also partially supported by Ministry of Health project MHCZ – DRO (UHHK, 00179906), Czechia.

Additional Experience

- **Lab lead** and demonstrator (2019-2023)
- Participation and project designing for undergraduate and MSc students
- Teaching assistant, reviewing assignments and quizzes

Undergraduate Students Assisted:

2022: Syed Sayyam Abbas – Department of Biosciences – COMSATS University Islamabad

2022: Shaiza Khan – Department of Biosciences – COMSATS University Islamabad

2020: Soha – Department of Biosciences – COMSATS University Islamabad

MSc Students Assisted:

2021: Sania Shafiq – Department of Biosciences – COMSATS University Islamabad

2022: Sitara Tahir – Department of Biosciences – COMSATS University Islamabad

2022: Peihan Song – Computer System Engineering – University of Glasgow, UK

References

i. Prof. Dr. Syed Muhammad Nurulain Email: syednurulain@gaus.edu.pk Mobile: +923323209686	ii. Assoc. Prof. Dr. Rabia Habib Email: rabiahabib@comsats.edu.pk Mobile: +923345098202
iii. Dr. Umer Zeeshan Ijaz Email: umer.ijaz@glasgow.ac.uk Mobile: +447562760679	iv. Assoc. Prof. Dr. Syed Tahir Abbas Shah Email: syedtahirabbas@comsats.edu.pk Mobile: +923335131025