

EDUCATION

1. PhD. Completed 12 months of research at the University of Bradford, Bradford, UK (2023-2024)	Microbiology & Molecular Genetics, PU	2025
2. Masters	Microbiology & Molecular genetics: University of Punjab, Lahore	2015-2017
3. B.S. (HONS)	Microbiology & Molecular genetics: University of Punjab, Lahore	2011-2015
4. F.Sc.(Pre-Medical) (equivalent to GCSC A'levels)	Kinnaird College for Women, Lahore (B.I.S.E Lahore)	2008-2010
5. Matriculation (equivalent to GCSC O'levels)	Esen Foundation High School, Lahore (B.I.S.E Lahore)	2006-2008

SCHOLARSHIPS & FELLOWSHIPS

- Commonwealth Split Site Fellowship funded by Commonwealth Scholarship Commission for 12 months at the University of Bradford, United Kingdom (1/2/2023-31/1/2024)
- International Research Support Initiative Program funded by HEC, Pakistan at the University of Toronto, Canada. (Not Aailed)

AWARDS & HONORS

- University Gold Medal for distinction in BS (2011-2015)
- 3rd Position in Masters (2015-2017)
- PU Merit Scholarship 2011-2015, 2015-2017
- Best Poster Award & Cash price in International conference of Solid State Physics 2017
- Best Poster Award & Cash Prize in International conference of Solid State Physics 2019

WORK EXPERIENCE

Assistant Professor (ADHOC) - 6.03.2025 at the Institute of Microbiology & Molecular Genetics, University of the Punjab, (ongoing)

Lecturer – Permanent – 20th August 2018- 6th March 2025 at the Department of Microbiology & Molecular Genetics, University of the Punjab (on-going)

Lecturer – on Contract 3rd July 2017-30th June 2018 at the Department of Microbiology & Molecular Genetics, University of the Punjab

RESEARCH INTEREST

Nano-biotechnology, Nano-medicine & Bacterial biofilms

PUBLICATIONS

Research Article:

1. **Khan, H. N.**, Imran, M., Sanaullah, I., Khan, I. U., Sabri, A. N., Naseem, S., & Riaz, S. (2023). In Vivo biodistribution, antioxidant and hemolysis tendency of superparamagnetic iron oxide nanoparticles–potential anticancer agents. *Arabian Journal of Chemistry*, 104602. (IF. 6.0)
2. Sanaullah, I., **Khan, H. N.**, Sajjad, A., Khan, S., Sabri, A. N., Naseem, S., & Riaz, S. (2023). Improved osteointegration response using high strength perovskite BaTiO₃ coatings prepared by chemical bath deposition. *Journal of the Mechanical Behavior of Biomedical Materials*, 138, 105635. (IF. 3.9)
3. SanaUllah, I., **Khan, H. N.**, Saleha, M., Imran, M., Raza, M. A., Sajjad, A., ... & Riaz, S. (2022). Free radical scavenging and antimicrobial activities of MW assisted sol-gel synthesized honey mediated zirconia. *Journal of Sol-Gel Science and Technology*, 1-19. (IF. 2.326)
4. Imran, M., Riaz, S., Shah, S. M. H., Batool, T., **Khan, H. N.**, Sabri, A. N., & Naseem, S. (2020). In-vitro hemolytic activity and free radical scavenging by sol-gel synthesized Fe₃O₄ stabilized ZrO₂ nanoparticles. *Arabian Journal of Chemistry*, 13(11), 7598-7608. (IF.4.762)
5. Sanaullah, I., Riaz, S., Batool, T., Bukhari, B. S., **Khan, H. N.**, Sabri, A. N., & Naseem, S. (2020). Antibacterial performance of glucose-fructose added MW based zirconia coatings– Possible treatment for bone infection. *Journal of the Mechanical Behavior of Biomedical Materials*, 103621. (IF 3.372)

Book Chapter:

1. **Khan, H. N.**, & Faisal, M. (2024). Bioremediation of Heavy Metals Using the Symbiosis of Hydrophytes and Metal-Resistant Bacteria. In *Membrane Technologies for Heavy Metal Removal from Water* (pp. 126-142). CRC Press.
2. **Khan, H. N.**, & Faisal, M. (2020). Planning and Engineering Strategies of Agricultural Wastes and Their Remediation Strategies. In *Contaminants in Agriculture* (pp. 219-232). Springer, Cham.
3. **Khan, H. N.**, & Faisal, M. (2018). Phytoremediation of Industrial Wastewater by Hydrophytes. In *Phytoremediation* (pp. 179-200): Springer.

University Funded Research Projects

1. A study of structural Characteristics of Bioactive Chitosan Hydrogels prepared from Marine Waste (2024-2025)
2. Starch Mediated Fabrication & Characterization of Gold and Silver Nanoparticles; A comparative Study of their Bioactivities (2021-2022)
3. Fabrication of Keratin Hydrogel Coated Metallic Nano-Complexes (K-Hy-AuNPs & K-Hy-AgNPs) For Effective Wound Treatments and Prevention of Wound Infections (2019-2020)
4. A green synthetic approach to synthesize gold nano-structures using plants and bacteria, their characterization and toxicity studies (2017-2018)

Research Supervision

Thesis completed

- **Graduate level**

- i. Biosynthesis of silver nanoparticles and their characterization using bacterial sugars and their toxicity profiling **(2018-2019)**
- ii. Bacterial carbohydrate mediated synthesis and structural characterization of non toxic Gold nanoparticles (2018-2019)
- iii. Studying the antibacterial properties and particle analysis of green synthesized ZnO nanoparticles (2019-2020)
- iv. Isolation of chitin from shrimp shell waste and preparation of antibacterial silver-chitosan hydrogel based bandages as possible wound dressings (2019-2020)

- **Masters level**

1. Treating Chromate allergy in cement factory workers using bio-agents (2018-2019)
2. Synthesis and Characterization of Antimicrobial Keratin Hydrogel and Keratin Coated Nanoparticles using Human Hair (2019-2020)
3. Phylogenetic Analysis of Low Density Lipoprotein Receptor (LDLR) Among Different Mammals. (2019-2020)
4. Green synthesis of Antibacterial Silver Nanoparticles their Characterization and Toxicity Analysis. (2019-2020)
5. A study of Bacterial Pathogen and Antibiotic Susceptibility Patterns in Chronic Suppurative Otitis Media in Children (2019-2020)
6. Synthesis Of Gold Nanoparticles Using Natural And Synthetic Starch: A Comparative Study of Bioactivity (2020-2021)
7. Antibiofilm potential of silver nanoparticles synthesized by *T. cordifolia*, *D. Carota* : A comparative study (2020-2021)
8. Preparation and structural characterization of bioactive chitosan hydrogels as possible implant coatings (2020-2022)

SUBJECTS TAUGHT

- Nanobiotechnology
- Cell Biology
- Microbial Genetics

- Fundamentals of Microbiology Lab
- DNA Damage & Repair

PROFESSIONAL SKILLS

Nanobiotechnology: Nanoparticle synthesis (chemical & Biosynthesis), characterization techniques (XRD, SEM, FTIR, UV-Vis Spectroscopy), cytotoxicity analysis, cell culturing, conjugation of nanoparticles to agents, use as delivery agents

Molecular Biology skills DNA/ plasmid isolation, PCR, Agarose and polyacrylamide gel electrophoresis, chromatographic separation, Primer designing, Sequence alignment and similarity searching

Routine Microbiology: Bacterial Isolation and Characterization, Bacterial Culture Preservation, Antibiotic screening & testing, Susceptibility Profiling, staining, Microscopic techniques: Phase Contrast, Fluorescence, Optical, Inverted, Working experience in BSL-3 and BSC-3 and bacterial biofilms

Bioinformatics tools: Molecular Evolutionary Genetics Analysis (MEGA), Croma, End note for Scientific referencing, GeneCards/Malacards, NCBI, 1000 genome Project, Image J, Visual molecular dynamics (VMD 1.9.1), Primer Designing (primerFox, Oligoanalyzer), orfFinder, Cap 3

TECHNICAL SKILLS

Microsoft Office (Word, Excel, PowerPoint), Prism, END-Note, Microsoft Windows & Macintosh OS

RESEARCH EXPERIENCE

PhD Thesis: Synthesis, Characterization and Bioactivities of Metallic Nanoparticles: Nanoparticle Loaded miRNA mimics

MS Thesis: Research on Green Synthesis, Characterization & Toxicity of Gold Nanoparticles using bacteria and aqueous Plant extracts and their Anticancer & Antimicrobial effects

- ✓ **Thesis title:** Synthesis, characterization and *In vitro* toxicity studies of gold nanoparticles

BS Thesis: Research on *Helicobacter pylori* and related bacteria isolated from peptic ulcer Biopsy

- ✓ **Thesis Title:** Biofilm forming Capabilities of bacteria isolated from peptic ulcer under natural and synthetic Antimicrobial stress

MEMBERSHIPS

- ✓ Healthcare and Biological Sciences Research Association (HBSRA)
- ✓ Member of American society of Microbiology (2012-current)
- ✓ Member of Pakistan Society for Microbiology (2012-current)
- ✓ Member of PYR welfare organization that works for the poor and Needy (2014-current)
- ✓ Co-ordinator of the literature wing of Character Building Society of Microbiology & Molecular genetics Punjab university (2012-2014)

CONFERENCES & WORKSHOPS

Conference & Symposia Proceedings

- ✓ Presented as an invited speaker (oral presentation) in International Conference on New Trends in Biological Sciences (March 21-22, 2022) organized by University of Okara.
- ✓ Presented (Poster) in International Conference on Solid State Physics, 8-11th Dec 2019
- ✓ Participated in International Conference of Punjab University (ICPU) on Recent trends in Molecular Science, 6-8th Nov, 2019
- ✓ Organised and presented in MMG2018: A Conference on Microbiology & Molecular Genetics, 7-9th Feb, 2018
- ✓ Participated in Faculty Development Orientation Program, 4-7th September, 2018
- ✓ Presented (oral & poster) in International Conference on Solid State Physics, Dec 2017
- ✓ Participated in event of ASM, Diversity in Microbiology: A cross talk, (17th December, 2015)
- ✓ Presented research work in 10th Biennial International Conference of Pakistan Society for Microbiology, Exploring Microbes for Future Endeavours. (25-28TH March, 2015).
- ✓ Participated and presented research work in 38th Annual PAP conference/3rd Joint Conference of societies of Pathology in Collaboration with royal College of pathologists and British Association of Pakistani Pathologists (6-8th November, 2015)
- ✓ Attended symposium on "Immunogenomics, Vaccinology & infectious Disease Challenges" Karachi (November, 2014)
- ✓ Attended First joint Conference PAP/RCPATH/AMP on "Molecular Pathology" (24th-26th November, 2014).
- ✓ Participated and presented Research work in one day symposium on "Multi Drug Resistant Organisms-an emerging issue", Organized by Department of Microbiology & Molecular Genetics. (May, 2014)
- ✓ Attended conference on "Bio-Physicochemical Basis for Technopreneurship " University of the Punjab Lahore (2nd – 3rd April, 2013)

Workshops Attended

- ✓ Participated in three days Hands on Training Workshop "Recombinant DNA Technology & Bioinformatics" at faculty of Life Sciences, University of Central Punjab, (25th-27th June, 2019)
- ✓ Workshop on Cell Culture Practices and applications organized by Tumor Metabolism group, Dept. of MMG, PU, 25th Oct 2018
- ✓ Pipette Clinic Workshop at University of the Punjab Organised by Eco Biosciences in collaboration with Eppendorf, 8th October, 2018
- ✓ Attended Faculty Development Orientation Program Organized By IAS University of the Punjab, Lahore (4-7th Sept, 2018)
- ✓ Attended workshop on "Dual use Research of Concern" jointly organized by Dept. of Microbiology & Molecular Genetics & The Health Security Partners (18th July, 2016)
- ✓ Participated in hands on training workshop on "DNA fingerprinting: a tool to explore Genetic diversity" (25th-26th May, 2016)
- ✓ Attended Hands on training workshop on "Blood: connects us all" (May, 2016)

- ✓ Attended hands on training workshop on “Transaminases and associated factors” (May, 2016)
- ✓ Attended hands on workshop on “Biosafety” organized by Karachi University in collaboration with ASM (November, 2014)
- ✓ Attended workshop on “the art of Scientific paper writing & how to win grants in COMSATS, Lahore (17th Dec, 2014)
- ✓ Seminar on “Scientific Writing: Guideline, Issues and Solution”, organized by Department of Microbiology & Molecular Genetics, University of the Punjab, Lahore. (27th March 2014).