



## PROFILE

Motivated researcher, teacher, and trainer

**JCR IF** **271.0**

**PUBLICATIONS** **92**

**Corresponding/first author** **51**

Research Articles	51
Book Chapters	17
Review Articles	24

**AUTHOR/EDITOR BOOKS (LOCAL)** **14**

**STUDENTS SUPERVISED** **61**

PhD Chemistry	03
MPhil Chemistry	30
MS Forensic	3
BS Chemistry	25

## CONTACT



Department of Chemistry,  
GC University, Lahore,  
Pakistan

<https://gcu.edu.pk/chemistry.php?pg=faculty>



0092 3004734288



[mgulzar@gcu.edu.pk](mailto:mgulzar@gcu.edu.pk)

# GULZAR MUHAMMAD ASSISTANT PROFESSOR

Department of Chemistry

Government College University Lahore,  
Lahore, Pakistan

## EDUCATION

**PhD (Bio-organic/Polymer Chemistry)** **(2018)**  
University of Sargodha, Sargodha, Pakistan

**MPhil (Chemistry)** **(2009)**  
Govt. College University Lahore, Lahore, Pakistan

**MSc (Organic Chemistry)** **(2003)**  
Bahauddin Zakariya University Multan, Multan Pakistan

## WORK EXPERIENCE

**Assistant Professor** **Jan 2019–Date**  
**Department of Chemistry, Government College University**  
**Lahore, Pakistan**

- Teaching Classes (BS, MS, and PhD)
- Conducting Practical classes (BS, MS, and PhD)
- Supervising BS, MS and PhD students
- Working as a secretary purchasing (2021-2024)
- Worked (two years) as Incharge of website updates (Departmental)
- Working as Incharge for prospectus update (2019 to date)
- Worked as a Coordinator Chemistry (2020)
- Working as Research Lab Incharge (2019 to date)
- Sports coordinator departmental (Sep 2024 to date)
- Working as Icharge for departmental website page (May 2025 to date)

**Lecturer** **May 2016–Jan 2019**  
Department of Chemistry, Government College University, Lahore, Pakistan

- Taught Classes from Grades 11-12 and BS
- Conducted Practical classes for Grades 11-12 and BS
- Supervised BS students



1. **USA (May 7, 2022, to June 18, 2022)**
2. **USA (May 5, 2023, to June 02, 2023)**



**Citations** 2301  
**h-Index** 23  
**i10-index** 42

<https://scholar.google.com.pk/citations?user=yYjTKi4AAAAJ&hl=en>



**Recorded 500 plus lectures for Grades 11 &12, BS, MS and PhD students and is free for all**

<https://www.youtube.com/channel/UCwTm4opXAixKGk4z8vbCeHA>



**Developed website with several thousand MCQs and is free for all**

<https://drgulzar.com/>

## RESEARCH EXPERTISE

- Organic synthesis
- Medicinal chemistry
- Targeted Drug Delivery Systems
- Wound Healing Studies
- Crosslinking of polymers
- Copolymerization of biomaterials
- Stimuli-Responsive polymers
- Smart Natural Hydrogels
- Water purification
- Nanoparticle Synthesis and Characterization
- Natural Hydrogel-Based Metallic Nanoparticles

## THESES

**PhD:** Hydrogel from seeds of *Mimosa pudica* L. isolation, modification, characterization and applications  
**MPhil:** Phytochemical investigations of *Alhagi pseudalhagi*  
**MSc:** Preparation and characterization of isoniazid derived Schiff bases

## HONORS AND AWARDS

- Deputy Commissioner's gold medal for getting a distinction in MSc
- Distinction in MSc Chemistry
- External examiner for Thesis Evaluation of different Universities (BZU Multan, UOS, Sargodha, UOL Lahore, LCWU Lahore, PU Lahore, UMT Lahore)
- Member, Board of Faculty, Superior University, Lahore
- Certificate in "Action research on Differentiating learning" from Oakland University, USA
- Editor of "Drug science and pharmacy" (2019-22)
- Reviewer for HEC research projects & International Journals
- Academic Board Member of ETERNO Press.
- Paper Setter (Chemistry) for MDCAT, 2023

## TEACHING EXPERTISE

- **Spectroscopic techniques (MS and PhD)**
  - UV-Visible
  - IR
  - $^1\text{H}$ NMR
  - $^{13}\text{C}$ NMR
  - Mass spectrometry
- **Chemistry of Natural Products (PhD)**
  - Alkaloids
  - Steroids
  - Saponins
  - Flavonoids
- **Stereochemistry (BS)**
  - Types of stereoisomers
  - RS and EZ notation
  - Optical activity
  - Stereoselectivity and Stereospecificity
  - Conformational analysis
- **Oxidation-Reduction Reactions (BS)**
  - Oxidizing and reducing agents
  - Cleavage of C-C bond
  - Addition of oxygen
  - Elimination of H
  - Reduction with cleavage
  - Name reactions
- **Types of organic reactions (BS)**
  - Substitution reactions
  - Elimination reactions
  - Addition reactions
  - Rearrangement reactions
  - Mechanism and stereochemistry
- **Chromatographic techniques (MS and PhD)**
  - GC-MS
  - HPLC
  - Size exclusion chromatography
  - Gas-Liquid chromatography
  - TLC and column chromatography
  - Ion exchange chromatography
- **Advanced Organic Polymers (MS)**
  - Step growth and Addition
  - Ziegler-Natta Coordination polymerization
  - Co-polymerization
  - Stereochemistry of polymers.
  - Theories of polymer solutions
- **Biochemistry (BS)**
  - Carbohydrates
  - Lipids
  - Proteins
  - Nucleic acids
  - Metabolism
  - Regulations and inhibition pathways
- **Basic organic chemistry (BS)**
  - Resonance
  - Inductive effect
  - Aromaticity
  - Hyperconjugation
  - Preparation of different functional groups
  - Interconversions of different functional groups
- **Pericyclic reactions (BS)**
  - Introduction to pericyclic reactions
  - Frontier orbital theory
  - Electrocyclic reactions
  - Cycloaddition reactions
  - Sigmatropic reactions

## PUBLICATIONS

1. Arshad S, Naseer M, Arif N, Majeed A, Raza MA, Muhammad G. Biogenic Synthesis of Silver Nanoparticles from Piper cubeb Corns with Potent Antioxidant and Antimicrobial Efficacy. *Pakistan Journal of Chemistry*, **2025**, 15(4), 106-113.  
<https://doi.org/10.15228/2025.v15.i4.p.106-113>.

## Dr. Gulzar Muhammad

2. Summer M, Ali S, **Muhammad G**, Sharjeel M. Bergenia ciliata Formulations Promote Wound Healing via Antioxidant, Antibacterial, Anti-Inflammatory, and Biomarkers Modulation. *ChemistrySelect*. **2025** Oct;10(40):e01395. **(IF 2.0)**
3. Urooj I, **Muhammad G\***, Irfan T, Suyama TL, Hussain MA, Amin M. Galactomannan-Based Mucilage from *Trigonella foenum-graecum* L.: Structural Insights, Extraction Strategies, and Applications in Food and Sustainable Biomaterials. *Journal of Agricultural and Food Chemistry*. **2025** Oct 21. **(IF 6.2)**
4. Ahmad N, Khurshid S, Wajid M, Ashfaq K, Asjad HM, Jahangir A, **Muhammad G\***. Therapeutic potential of *Salvia hispanica* seed extract in alloxan-induced diabetic mice: phytochemical, biochemical, histological, and in silico approaches. *Journal of Food Measurement and Characterization*. **2025** Aug 18:1-29. **(IF 3.3)**
5. Rehman NU, **Muhammad G\***, Wajid M, Hussain MA, Tuba T, Sharif MU, Majeed A. Galactomannan-Stabilized Gold Nanoparticles: A Sustainable Nanoplatform for Biomedical and Environmental Applications. *ChemistrySelect*. **2025** Aug;10(32):e02650. **(IF 2.0)**
6. Hussain MA, Raees N, Ali A, Tayyab M, **Muhammad G**, Uroos M, Batoon M. Optimization of rhamnogalacturonan extraction from linseed using RSM and designing a pH responsive tablet formulation for sustained release of ciprofloxacin. *Cellulose Chemistry & Technology*. **2025** May 1;59. **(IF 1.1)**
7. Saif T, Azam A, Tuba, **Muhammad G\***, Raza MR, Majeed A, Raza MA. Quince seed gel-mediated zinc oxide nanoparticles: Synthesis, characterization, drug loading, and antimicrobial evaluation. *Journal of Chemical Research*. **2025** Aug;49(4):17475198251361571. **(IF 1.2)**
8. Ashraf A, Siddiqui WA, Ashfaq M, Niaz S, Raza MA, **Muhammad G**, Tahir MN, Islam MS, Nashre-ul-Islam SM, Ilyas MI, Dahlous KA. Integrative Experimental and DFT Study of Sulfonyl Hybrid Benzimidazole-Based Zwitterions: Crystallography, HSA, and Electronic Properties. *ChemistrySelect*. **2025** Jul;10(27):e01994. **(IF 2.0)**
9. Zulfiqar Z, Javed S, Fatima Z, Liaquat S, Wajid M, **Muhammad G\***, Hussain MA, Majeed A. A Comparative Study of Phytochemistry and Pharmacological Attributes of *Musa sapientum* and *Musa paradisiaca*. *Chemistry & Biodiversity*. **2025**:e00841. **(IF 2.5)**

## Dr. Gulzar Muhammad

10. Fatima Z, Zulfiqar Z, Javed S, **Muhammad G\***, Hussain MA. Alkaloids from the Genus *Tylophora*: Isolation, Characterization, and Biological Applications. *InNatural Products: Phytochemistry, Botany, Metabolism of Alkaloids, Phenolics and Terpenes* **2025** Jun 25 (pp. 1-45). Berlin, Heidelberg: Springer Berlin Heidelberg.

11. Saleem S, Wajid M, **Muhammad G\***, Mushtaq A, Amin M. Therapeutic Potential of *Thymus linearis* in Alloxan-Induced Diabetic Mice: LC-MS Profiling, Biochemical, Histological, and Computational Approaches. *ChemistrySelect*. **2025** Jun;10(24):e00105. **(IF 2.0)**

12. Hussain MA, Taj T, Ali A, Haseeb MT, Hussain SZ, **Muhammad G**, Bukhari SN. Cross-Linking of Hydroxypropylcellulose With Flaxseed Rhamnogalacturonans Using Citric Acid Produces a Hemocompatible Biocomposite for pH - Responsive Rifaximin Delivery. *Journal of Applied Polymer Science*. **2025**:e57486. **(IF 2.8)**

13. Majeed A, Akram S, **Muhammad G\***, Raza MR, Badar R, Mushtaq M. Optimizing mucilage extraction from *Plantago major* seeds using response surface methodology for enhanced functional characteristics. *Journal of Food Measurement and Characterization*. **2025** Jun 12:1-8. **(IF 3.3)**

14. Wajid M, Siddique F, **Muhammad G\***, Uzair M, Gohar UF, Jabeen M, Bashir M, Hayat MM, Ahmad S. Design, Synthesis, Biological Assessment, and Computational Analysis of Sulfathiazole Schiff Bases. *Journal of Computational Biophysics and Chemistry*. **2025** May 23. **(IF 2.3)**

15. Ayub T, **Muhammad G\***, Sharif MU, Raza MR, Hanif H, Amin M, Hussain MA. Glucuronoxylan hemicellulose-based manganese oxide nanoparticles for enhanced bactericidal, wound healing, and photocatalytic potential. *Journal of Applied Biomaterials & Functional Materials*. **2025** Apr;23:22808000251328937. **(IF 3.1)**

16. Iqbal MA, Akram S, Khalid S, Amin L, Ahmad F, Malhat F, **Muhammad G**, Ashraf R, Mushtaq M. Citric Acid-Assisted Extraction of High Methoxy Pectin from Grapefruit Peel and Its Application as Milk Stabilizer. *Food and Bioprocess Technology*. **2025** Mar 22:1-7. **(IF 5.8)**

17. Khatoon M, Ali A, Hussain MA, Haseeb MT, **Muhammad G**, Sher M, Hussain SZ, Hussain I, Iqbal M. Chia (*Salvia hispanica* L.) seed mucilage-based glucoxylan-

grafted-acrylic acid hydrogel: A smart material for pH-responsive drug delivery systems. *Materials Advances*. **2025. (IF 4.7)**

**18.** Summer M, Ali S, **Muhammad G**, Riaz A. Evaluating the Wound Healing Potential of Characterized *Bergenia ciliata*-Loaded *Salvia hispanica* Hydrogel in Diabetic Mice. *Microscopy Research and Technique*. **2025. (IF 2.1)**

**19.** Ismail F, Ismail WU, **Muhammad G\***, Hussain MA, Zulfiqar Z. Phytochemistry, Pharmacological Attributes, and Clinical Evaluations of *Coriandrum sativum*: A Comprehensive Review. *Natural Product Communications*. **2025** Jan;20(1):1934578X241312791. **(IF 1.4)**

**20.** Wajid M, Uzair M, **Muhammad G\***, Shafiq Z, Siddique F, Kaya S, Ahmad S, Alshabrmii FM, Alkhayl FF, Alatawi EA. Sulfaquinoxaline-Derived Schiff Bases: Synthesis, Characterization, Biological Profiling, and Computational Modeling. *Journal of Molecular Structure*. **2025** Sep 30:140231. **(IF 4.7)**

**21.** Tuba, Hussain MA, **Muhammad G\***, Raza MA, Ashraf A, Haseeb MT, Mushtaq M, Shafiq Z. A comprehensive review on phytochemistry, pharmacology, preclinical, and clinical trials of *Cydonia oblonga*. *Phytochemistry Reviews*. **24**, **2025** :85-118. **(IF 7.6)**

**22.** Assad N, Naeem-ul-Hassan M, Ajaz Hussain M, Abbas A, Sher M, **Muhammad G**, Assad Y, Farid-ul-Haq M. Diffused sunlight assisted green synthesis of silver nanoparticles using *Cotoneaster nummularia* polar extract for antimicrobial and wound healing applications. *Natural Product Research*. **2025** Apr 18;39(8):2203-17. **(IF 1.6)**

**23.** Naeem M, Ashraf A, Imran M, Siddiqui WA, **Muhammad G**, Saleem A, Younas U, Ali F, Raza MA, Mitu L. Oxicams as bioactive ligand system in coordination complexes and their biological applications. *Comments on Inorganic Chemistry*. **2025** Mar 4;45(2):63-87. **(IF 3.7)**

**24.** **Muhammad G**, Hussain MA, Shafiq Z, Ashraf A, Shafique U, Khan A, Khalid A, Hussain J, Al-Harrasi A. Pharmacological and therapeutic potential of berbamine: a potent alkaloid from genus *berberis*. *Current Topics in Medicinal Chemistry*. **2025** Mar;25(8):891-920. **(IF 3.3)**

**25.** Saleem S, Mushtaq A, **Muhammad G\***, Wajid M, Siddique F, Alshabrmii FM, Aba Alkhayl FF, Alatawi EA. GC-MS Profiling, Pharmacological Predictions, Molecular Docking, and ADME Studies of Different Parts of *Thymus Linearis* against Multiple

**26.** Summer M, Hussain T, Ali S, Khan RR, **Muhammad G**, Liaqat I. Exploring the underlying modes of organic nanoparticles in diagnosis, prevention, and treatment of cancer: a review from drug delivery to toxicity. *International Journal of Polymeric Materials and Polymeric Biomaterials*. **2025** Jun 13;74(9):829-45. (IF 2.6)

**27.** Khan MA, Akram S, Naeem R, Kamal MU, **Muhammad G**, Mushtaq M, Anwar F, Hosseini-Bandegharaei A. Essentials and Pertinence of Cold Plasma in Essential Oils, Metal–Organic Frameworks and Agriculture. *Food Science & Nutrition*. **2024**. (IF 3.8)

**28.** Rehman NU, **Muhammad G\***, Sharif MU, Hussain MA. Green synthesis of silver nanoparticles using *Lepidium sativum* seed mucilage as a bioreductant/capping agent for efficient antibacterial and photocatalytic activities. *Desalination and Water Treatment*. **2024** Oct 18:100853. (IF 1.0)

**29.** Javed S, Zulfiqar Z, Fatima Z, **Muhammad G\***, Hussain MA, Mushtaq M, Haseeb MT. A comprehensive review of plant-based mucilages as promising candidates for water remediation. *Journal of Environmental Chemical Engineering*. **2024** Sep 2:114035. (IF 7.2)

**30.** Khatoon M, Ali A, Hussain MA, Haseeb MT, Sher M, Alsaidan OA, **Muhammad G**, Hussain SZ, Hussain I, Bukhari SN. A superporous and pH-sensitive hydrogel from *Salvia hispanica* (chia) seeds: stimuli responsiveness, on–off switching, and pharmaceutical applications. *RSC advances*. **2024**;14(38):27764-76. (IF 4.6)

**31.** Haseeb MT, **Muhammad G**, Hussain MA, Bukhari SN, Sheikh FA. Flaxseed (*Linum usitatissimum*) mucilage: A versatile stimuli–responsive functional biomaterial for pharmaceuticals and healthcare. *International Journal of Biological Macromolecules*. **2024** Aug 21:134817. (IF 8.5)

**32.** **Muhammad G\***, Laila KN, Sharif MU, Tuba, Hussain MA, Majeed A, Saleem S. Polysaccharide-mediated synthesis of copper oxide nanoparticles for enhanced photodegradation of methyl orange and methylene blue. *Cellulose Chemistry and Technolgy*. **2024**, 58 (5-8), 637-646. (IF 1.1)

**33.** Fatima Z, Azam A, Iqbal MZ, Badar R, **Muhammad G\***. A comprehensive review on effective removal of toxic heavy metals from water using genetically

**(IF 1.0)**

**34.** Fatima Z, Fatima S, **Muhammad G\***, Hussain MA, Raza MA, Amin M, Majeed A. Stimuli-responsive glucuronoxylan polysaccharide from quince seeds for biomedical, food packaging, and environmental applications. International Journal of Biological Macromolecules. **2024** Jun 13:133016. **(IF 8.5)**

**35.** Fatima Z, Saleem R, Khan RR, Liaqat M, Pervaiz M, Saeed Z, **Muhammad G**, Amin M, Rasheed S. Green Synthesis, Properties, and Biomedical Potential of Gold Nanoparticles: A Comprehensive Review. Biocatalysis and Agricultural Biotechnology. **2024** Jun 1:103271. **(IF 3.8)**

**36.** Wajid M, Uzair M, **Muhammad G\***, Siddique F, Bashir M, Nadeem S, Ashraf A, Assad N, Mushtaq A, Rafay MZ, Aqdas A. Sulfamethoxazole-derived Schiff bases: Synthesis, characterization, biological activities, molecular docking, DFT, and ADME studies. Journal of Molecular Structure. **2024** May 15:138640. **(IF 4.7)**

**37.** Noor M, **Muhammad G\***, Hanif H, Hussain MA, Iqbal MM, Mehmood U, Taslimi P, Shafiq Z. Structure, chemical modification, and functional applications of mucilage from Mimosa pudica seeds-A review. International Journal of Biological Macromolecules. **2024** May 14:132390. **(IF 8.5)**

**38.** Javed S, Raza MR, Sharif MU, Majeed A, Hussain MA, **Muhammad G\***. Quince (*Cydonia oblonga*) seed hydrogel-based green synthesis of copper oxide nanoparticles for photocatalytic degradation of methylene blue and methyl orange. Desalination and Water Treatment. **2024** May 10:100388. **(IF 1.0)**

**39.** Wajid M, Uzair M, **Muhammad G\***, Siddique F, Ashraf A, Ahmad A, Alasmari AF. Biological Activities, DFT and Molecular Docking Studies of Novel Schiff Bases Derived from Sulfamethoxypyridazine. ChemistrySelect, **2024**, <https://doi.org/10.1002/slct.202400675>. **(IF 2.0)**

**40.** Farid-ul-Haq M, Hussain MA, Ali A, Haseeb MT, **Muhammad G**, Tabassum T, Ashraf MU, Tulain UR, Erum A. A pH-responsive *Artemisia vulgaris* mucilage-co-acrylic acid hydrogel: Synthesis, characterization, controlled drug release, toxicity studies, and MRI. Journal of Drug Delivery Science and Technology. **2024** Feb 8:105468. **(IF 4.9)**

**41.** Sajjad N, Sultan A, **Muhammad G\***, Azam A, Raza MA, Hussain MA, Ali L. Application of Genetically Modified Microorganisms for Remediation of Petrol

## Dr. Gulzar Muhammad

Discharges and Related Polluted Sites. In Genetically Engineered Organisms in Bioremediation **2024** (pp. 86-105). CRC Press.

**42.** Hussain MA, Shaheen A, Hussain SZ, Hussain I, Haseeb MT, **Muhammad G.** Carboxy-functionalized polysaccharide mediated green synthesis of antimicrobial silver nanoparticles. *Cellulose Chemistry and Technology*, **2023**, 57 (9-10) 993-999. **(IF 1.1)**

**43.** Iqbal MM, **Muhammad G\***, Hussain MA, Hanif H, Raza MA, Shafiq Z. Recent trends in ozone sensing technology. *Analytical Methods*, **2023**, 15, 2798-2822. **(IF 2.6)**

**44.** **Muhammad G\***, Iqbal MM, Shahid M, Ashraf RS, Altaf M, Hussain MA, Raza MA. Purification of water by the use of hydrogels. *Green Sustainable Process for Chemical and Environmental Engineering and Science*. **2023** Jan 1:69-112.

**45.** **Muhammad G\***, Saleem S, Shahid M, Ashraf RS, Altaf M, Raza MA, Amin M. Synthesis and biological applications of heparin-based composites. In *Green Sustainable Process for Chemical and Environmental Engineering and Science* **2023** Jan 1 (pp. 347-373). Elsevier.

**46.** Hussain, M. A., Fatima, S., Abbas, A., Ali, A., Amin, M., **Muhammad, G.**, Sher, M. Removal of Cr(III) and Ni(II) from aqueous solution using a mixed cellulose ether-ester hydroxyethylcellulose adipate. *Desalination and Water Treatment*. 283, 153-163, **2023**. **(IF 1.0)**

**47.** Ali A, Haseeb MT, Hussain MA, Tulain UR, **Muhammad G**, Azhar I, Hussain SZ, Hussain I, Ahmad N. A pH responsive and superporous biocomposite hydrogel of *Salvia spinosa* polysaccharide-co-methacrylic acid for intelligent drug delivery. *RSC advances*. **2023**;13(8):4932-48. **(IF 4.6)**

**48.** Ali A, Hussain MA, Abbas A, Haseeb MT, Azhar I, **Muhammad G**, Hussain SZ, Hussain I, Alotaibi NF. Succinylated *Salvia spinosa* hydrogel: Modification, characterization, cadmium-uptake from spiked high-hardness groundwater and statistical analysis of sorption data. *Journal of Molecular Liquids*. **2023** Feb 11:121438. **(IF 5.2)**

**49.** Ali A, Hussain MA, Haseeb MT, Ashraf MU, Farid-ul-Haq M, Tabassum T, **Muhammad G**, Abbas A. pH-Responsive, Hemocompatible, and Non-Toxic Polysaccharide-Based Hydrogel from Seeds of *Salvia spinosa* L. for Sustained Release of Febuxostat. *Journal of the Brazilian Chemical Society*, **2023**, 1-12. **(IF 1.3)**

## Dr. Gulzar Muhammad

50. Khan A, Hussain MA, Nawaz H, **Muhammad G**, Lang I, Ashraf U. Physiological Interventions of Antioxidants in Crop Plants Under Multiple Abiotic Stresses. InSustainable Agriculture in the Era of the OMICs Revolution **2023** (pp. 431-471). Springer, Cham.

51. Ali A, Hussain MA, Haseeb MT, Tulain UR, Farid-ul-Haq M, Tabassum T, **Muhammad G**, Hussain SZ, Hussain I, Erum A. Synthesis, characterization, and acute toxicity of pH-responsive *Salvia spinosa* mucilage-co-acrylic acid hydrogel: A smart excipient for drug release applications. *Reactive and Functional Polymers*. **2023** Jan 1;182:105466. **(IF 5.1)**

52. Ali A, Hussain MA, Haseeb MT, Bukhari SN, **Muhammad G**, Sheikh FA, Farid-ul-Haq M, Ahmad N. A Smart Hydrogel from *Salvia Spinosa* Seeds: pH Responsiveness, On-off Switching, Sustained Drug Release, and Transit Detection. *Current Drug Delivery*. **2023**. **(IF 3.0)**

53. Amin M, Sharif S, Akram S, **Muhammad G**, Amin S, Ashraf R, Mushtaq M. A dispersive liquid-liquid microextraction followed by reverse - phase high - performance liquid chromatography for QuEChERS determination of chlorogenic acid. *Phytochemical Analysis*. **2023** Sep 23. **(IF 2.6)**

54. Iqbal MM, **Muhammad G\***, Saif T, Aslam MS, Raza MA, Hussain MA, Haseeb MT. Nanogenerators as a Sustainable Power Source. InNanogenerators (pp. 301-322). CRC Press, **2023**.

55. Ali A, Haseeb MT, Hussain MA, Tayyab M, **Muhammad G**, Ahmad N, Alotaibi NF, Hussain SZ, Hussain I. Extraction optimization of a superporous polysaccharide-based mucilage from *Salvia spinosa* L. *Cellulose Chemistry and Technology*, **2022**, 56(9-10), 957-969. **(IF 1.1)**

56. Farooq R, Batoor Z, Khalid M, Khan MU, Braga AA, Ragab AH, Al-Mhyawi SR, **Muhammad G**, Shafiq Z. Synthesis, nonlinear optical analysis and DFT studies of D-π-D and A-π-A configured Schiff bases derived from bis-phenylenediamine. *RSC Advances*. **2022**;12(50):32185-96. **(IF 4.6)**

57. Azam A, **Muhammad G\***, Aslam MS, Iqbal MM, Raza MA, Akhtar N, Hussain MA, Sajjad N, Syed A, Bahkali AH, Shafiq Z. Enhanced bactericidal and in vivo wound healing potential of biosynthesized zinc oxide nanoparticles from psyllium mucilage. *Applied Organometallic Chemistry*, **2022**:e6923. **(IF 3.7)**

## Dr. Gulzar Muhammad

58. Basit Z, Akram H, Iqbal MM, **Muhammad G\***, Aslam MS, Gul I, Jamil M, Tahir MH. Protein Redesign and Engineering Using Machine Learning. Drug Design Using Machine Learning. **2022** Oct 10:247-82.

59. Hussain MA, Abbas A, Yameen E, Ali A, **Muhammad G**, Hussain M, Shafiq Z. Adsorptive removal of  $Pb^{2+}$  and  $Cu^{2+}$  from aqueous solution using an acid modified glucuronoxylan-based adsorbent. DESALINATION AND WATER TREATMENT. **2022** Feb 1;248:163-75. (IF 1.0)

60. Batoor Z, **Muhammad G\***, Iqbal MM, Aslam MS, Raza MA, Sajjad N, Abdullah M, Akhtar N, Syed A, Elgorban AM, Al-Rejaie SS. Hydrogel assisted synthesis of gold nanoparticles with enhanced microbicidal and in vivo wound healing potential. Scientific Reports. **2022** Apr 21;12(1):1-0. (IF 3.9)

61. Sajjad N, Orfali R, Perveen S, Rehman S, Sultan A, Akhtar T, Nazir A, **Muhammad G**, Mehmood T, Ghaffar S, Al-Taweel A. Biodiesel Production from Alkali-Catalyzed Transesterification of *Tamarindus indica* Seed Oil and Optimization of Process Conditions. Molecules. **2022** Jan;27(10):3230. (IF 4.6)

62. Ali A, Hussain MA, Abbas A, Khan TA, **Muhammad G**, Haseeb MT, Azhar I. comparative isoconversional thermal analysis and degradation kinetics of *Salvia spinosa* (kanocha) seed hydrogel and its acetates: a potential matrix for sustained drug release. Cellulose Chemistry and Technology. **2022** Mar 1;56(3-4):239-50. (IF 1.1)

63. Saif S, Saif T, Raza MA, **Muhammad G\***, Iqbal MM, Ur Rehman N, Hussain MA. An Introduction to Membrane-Based Systems for Dye Removal. In Membrane Based Methods for Dye Containing Wastewater **2022** (pp. 1-22). Springer, Singapore.

64. Iqbal MM, **Muhammad G\***, Raza MA, Aslam MS, Hussain MA, Shafiq Z. Fibrous Membranes for Water Purification: Focusing on Dye Removal. In Membrane Based Methods for Dye Containing Wastewater **2022** (pp. 79-120). Springer, Singapore.

65. Azam A, **Muhammad G\***, Raza MA, Iqbal MM, Aslam MS, Ashraf A, Saif T. Aerobic Biological Units in Dye Removal. In Biological Approaches in Dye-Containing Wastewater **2022** (pp. 57-94). Springer, Singapore.

66. Saleem S, **Muhammad G\***, Iqbal MM, Hussain MA, Raza MA, Shafiq Z, Razzaq H. Polysaccharide-Based Liquid Crystals. Polysaccharides: Properties and Applications. **2021** May 17:573-90.

## Dr. Gulzar Muhammad

67. Ashraf RS, Abid Z, Shahid M, Rehman ZU, **Muhammad G\***, Altaf M, Raza MA. Methods for the treatment of wastewaters containing dyes and pigments. Water pollution and remediation: Organic pollutants. **2021**:597-661.

68. Altaf M, Yamin N, **Muhammad G\***, Raza MA, Shahid M, Ashraf RS. Electroanalytical techniques for the remediation of heavy metals from wastewater. Water Pollution and Remediation: Heavy Metals. **2021**:471-511.

69. Iqbal MM, **Muhammad G\***, Aslam MS, Hussain MA, Shafiq Z, Razzaq H. Algal Biofertilizer. Biofertilizers: Study and Impact. **2021** Jul 20:607-35.

70. Lodhi BA, Hussain MA, Ashraf MU, Haseeb MT, **Muhammad G**, Farid-ul-Haq M, Naeem-ul-Hassan M. **2020**. Basil (*Ocimum basilicum L.*) seeds engender a smart material for intelligent drug delivery: On-Off switching and real-time swelling, in vivo transit detection, and mechanistic studies. Industrial Crops and Products.155:112780. **(IF 6.2)**

71. Nazar S, Hussain MA, Khan A, **Muhammad G**, Bukhari SN. Alkaloid-rich plant *Tylophora indica*; current trends in isolation strategies, chemical profiling and medicinal applications. Arabian Journal of Chemistry. **2020** Aug 1;13(8):6348-65. **(IF 5.2)**

72. Saleem S, **Muhammad G**, Hussain MA, Altaf M, Bukhari SN. *Withania somnifera L.*: Insights into the phytochemical profile, therapeutic potential, clinical trials, and future prospective. Iranian Journal of Basic Medical Sciences. **2020** Dec;23(12):1501. **(IF 2.7)**

73. **Muhammad G\***, Mehmood A, Shahid M, Ashraf RS, Altaf M, Hussain MA, Raza MA. Biochemical methods for water purification. Methods for Bioremediation of Water and Wastewater Pollution. **2020**:181-212.

74. **Muhammad G**, Haseeb MT, Hussain MA, Ashraf MU, Farid-ul-Haq M, Zaman M. Stimuli-responsive/smart tablet formulations (under simulated physiological conditions) for oral drug delivery system based on glucuronoxylan polysaccharide. Drug Development and Industrial Pharmacy. **2020** Jan 2;46(1):122-34. **(IF 2.2)**

75. Hussain MA, Rana AI, Haseeb MT, **Muhammad G**, Kiran L. Citric acid cross-linked glucuronoxylans: A pH-sensitive polysaccharide material for responsive swelling-deswelling vs various biomimetic stimuli and zero-order drug release. Journal of Drug Delivery Science and Technology. **2020** Feb 1;55:101470. **(IF 4.9)**

## Dr. Gulzar Muhammad

76. Hussain MA, **Muhammad G**, Haseeb MT, Tahir MN. Quince seed mucilage: a stimuli-responsive/smart biopolymer. *Functional biopolymers*. 2019;127-48.

77. Hussain MA, Haseeb MT, **Muhammad G**, Tahir MN. Inulin Type Fructan: A Versatile Functional Material for Food and Healthcare. *Functional Biopolymers*. 2019;557.

78. Nazar S, Hussain MA, Khan A, Muhammad G, Tahir MN. Comprehensive review of its traditional uses, phytochemistry, pharmacology and nutrapharmaceutical potential. **2018**, *Arabian Journal of Chemistry*. (IF 5.2)

79. Saleem S, **Muhammad G**, Hussain MA, Bukhari SN. A comprehensive review of phytochemical profile, bioactives for pharmaceuticals, and pharmacological attributes of *Azadirachta indica*. *Phytotherapy research*. **2018** Jul;32(7):1241-72. (IF 6.3)

80. **Muhammad G**, Hussain MA, Ashraf MU, Naeem-ul-Hassan M, Bukhari SN. Appraisal of acute oral toxicity of glucuronoxylan hydrogel from *Mimosa pudica* seeds. *Brazilian Journal of Pharmaceutical Sciences*. **2018** Nov 29;54(03):e17579. (IF 0.6)

81. **Muhammad G**, Abbas AZ, Hussain MA, Sher MU, Abbas NS. Chemically modified glucuronoxylan: a novel material for heavy metal ion removal from aqueous and spiked high hardness groundwater. *Cellulose Chemistry and Technology*. **2018** Oct 1;52:909-19. (IF 1.1)

82. Hussain MA, Ashraf MU, **Muhammad G**, Tahir MN, Bukhari SNA. Calixarene: a versatile material for drug design and applications. *Current pharmaceutical design*. **2017** May 1;23(16):2377-88. (IF 2.8)

83. **Muhammad G**, Hussain MA, Amin M, Hussain SZ, Hussain I, Bukhari SN, Naeem-ul-Hassan M. Glucuronoxylan-mediated silver nanoparticles: green synthesis, antimicrobial and wound healing applications. *RSC advances*. **2017**;7(68):42900-8. (IF 4.6)

84. Ashraf MU, Hussain MA, **Muhammad G**, Haseeb MT, Bashir S, Hussain SZ, Hussain I. A superporous and superabsorbent glucuronoxylan hydrogel from quince (*Cydonia oblonga*): Stimuli responsive swelling, on-off switching and drug release. *International journal of biological macromolecules*. **2017** Feb 1;95:138-44. (IF 8.5)

85. **Muhammad G**, Hussain MA, Jantan I, Bukhari SN. *Mimosa pudica* L., a high-value medicinal plant as a source of bioactives for pharmaceuticals. *Comprehensive reviews in food science and food safety*. **2016** Mar;15(2):303-15. (IF 14.1)

## Dr. Gulzar Muhammad

86. Hussain MA, **Muhammad G**, Jantan I, Bukhari SN. Psyllium arabinoxylan: A versatile biomaterial for potential medicinal and pharmaceutical applications. *Polymer Reviews*. 2016 Jan 2;56(1):1-30. **(IF 11.9)**

87. Ashraf MU, **Muhammad G**, Hussain MA, Bukhari SN. Cydonia oblonga M., a medicinal plant rich in phytonutrients for pharmaceuticals. *Frontiers in pharmacology*. 2016 Jun 21;7:209166. **(IF 4.8)**

88. Anwar F, **Muhammad G**, Hussain MA, Zengin G, Alkharfy KM, Ashraf M, Gilani AH. Capparis spinosa L.: a plant with high potential for development of functional foods and nutraceuticals/pharmaceuticals. *International Journal of Pharmacology*, 2016, 12, pp.201-219. **(IF 0.2)**

89. **Muhammad G**, Hussain MA, Ashraf MU, Haseeb MT, Hussain SZ, Hussain I. Polysaccharide based superabsorbent hydrogel from *Mimosa pudica*: swelling-deswelling and drug release. *RSC advances*. 2016, 6(28):23310-7. **(IF 4.6)**

90. **Muhammad G**, Amin M, Hussain MA, Sher M, Hussain M. Comparative isoconversional thermal analysis and degradation kinetics of acetylated *mimosa pudica* (touch-me-not) hydrogel. *Journal of the Chemical Society of Pakistan* 2016, Feb 1;38(1):1-0. **(IF 0.5)**

91. **Muhammad G**, Hussain MA, Anwar F, Ashraf M, Gilani AH. *Alhagi*: a plant genus rich in bioactives for pharmaceuticals. *Phytotherapy Research*. 2015, 29(1), pp.1-13. **(IF 6.3)**

92. **Muhammad G**, Asghar MN, Ahmad M, Kashmiri MA, Zia I. Antioxidant and antimicrobial activities of extracts from aerial parts of *Alhagi pseudalhagi*. *Asian Journal of Chemistry*, 2011, 23(3), p.971.

## FUNDINGS/PROJECTS

1. A project worth 290k PKR on "Design, synthesis, and characterisation of novel Schiff bases as COX inhibitors with analgesic and anti-inflammatory activities" funded by ORIC GC University, Lahore (426/ORIC/24).
2. Funding from the US State Department for two years (1.5 months in 2022 and 1.5 months in 2023) training on "Action research on Differentiating learning" from Oakland University, USA.

## REVIEWER FOR PUBLICATIONS

1. Journal of drug delivery science and technology, 2020 **(1)**

2. Frontiers in Nutrition, 2022 **(1)**
3. Phytochemistry Reviews, 2024 **(1)**
4. Desalination and Water Treatment, 2024 **(1)**
5. Natural Product Communications, 2024 **(1)**
6. Biomass Conversion and Biorefinery, 2024 **(1)**, 2025 **(1)**
7. ChemistrySelect, 2024 **(2)**, 2025 **(4)**
8. Chemistry and Biodiversity, 2024 **(1)**, 2025 **(5)**
9. Revista Mexicana de Ingeniería Química, 2024 **(1)**
10. Journal of Chemistry and Material Sciences (JCMS), 2024 **(1)**
11. Next Research, 2024 **(1)**
12. Journal of Biochemical and Molecular Toxicology, 2025 **(2)**
13. ChemBioEng Reviews, 2025 **(1)**
14. Algal Research, 2025 **(1)**
15. ACS Food Science & Technology, 2025 **(1)**
16. Heliyon 2025 **(1)**
17. Starch 2025 **(1)**
18. ChemistryOpen 2025 **(1)**
19. Advanced Sustainable Materials, 2025 **(1)**
20. Discover Applied Sciences 2025 **(1)**
21. Archives of Microbiology 2025 **(2)**
22. Environmental Quality Management 2025 **(1)**

## CONFERENCES/TRAININGS

1. Attended a seminar on "Public-Private Partnership in Education and Education policy" by Pakistan Education Foundation (PEF) on **August 02, 2025**.
2. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Lahore Zone (Superior Group) on **July 12, 2025**.
3. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Faisalabad Zone (Superior Group) on **July 04, 2025**.
4. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Rawalpindi Zone (Superior Group) on **July 03, 2025**.

## Dr. Gulzar Muhammad

5. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Mianwali Zone (Superior Group) on **July 02, 2025**.
6. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Sargodha Zone (Superior Group) on **July 01, 2025**.
7. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Sialkot Zone (Superior Group) on **June 28, 2025**.
8. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Gujranwala Zone (Superior Group) on **June 27, 2025**.
9. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of DG Khan Zone (Superior Group) on **June 26, 2025**.
10. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Multan Zone (Superior Group) on **June 25, 2025**.
11. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Bahawalpur Zone (Superior Group) on **June 24, 2025**.
12. Delivered a talk on the new curriculum, teaching methodology, and use of integrated technology in chemistry teaching to Chemistry teachers of Okara Zone (Superior Group) on **June 23, 2025**.
13. Delivered a talk on "Hydrogels as Unique Scaffolds for drug delivery" on December 07, **2024**, at the "1<sup>st</sup> International Conference on Sciences for Future Trends (ICSFT), held at The University of Lahore, Sargodha campus (7-8 December **2024**).
14. Delivered a talk on "AI-Based Tools for Effective Teaching of Chemical Reactions and Mechanisms" on September 14, **2024**, in the "Three Days Training (12-14 September **2024**) "Adapting Student-centred Teaching to Meet Diverse Educational Needs" at the Department of Chemistry, University of Lahore, Lahore.

## Dr. Gulzar Muhammad

15. Presented a talk on "Crafting Clear Objectives and Titles for Scientific Writing" at the Department of Biological Sciences, Superior University Lahore on September 7, **2024**.
16. Presented talks on "Student-oriented Quality Chemistry Teaching for Better Results" to chemistry teachers of The Superior Group from all cities of Punjab (July 01, **2024**, to July 13, **2024**).
17. Attended a webinar on "Back to Basics - Sample Preparation: Theory and Overview" by Waters on May 07, **2024**.
18. Attended a webinar on "Clean water innovations: Addressing global challenges" by Chemistry world on April 30, **2024**.
19. Attended a webinar on "Solve your dosage form and delivery challenges with Lonza Capsule Application Lab" by European Pharmaceutical Review on Feb 21, **2024**.
20. Participated in an online tutorial on "Introduction to Raman in an SEM world" by Oxford Instruments on Jan 18, **2024**.
21. Participated in a webinar on "Comprehensive Characterization of Lithium-Ion Battery Materials using TESCAN FIB-SEM with integrated ToF-SIMS" by TESCON group on Jan 16, **2024**.
22. Presented a talk in first biennial international (hybrid) conference on pharmaceutical and life sciences on "Hydrogel-based Advanced Drug Delivery Systems" at Gulab Devi Educational Complex Ferozepur Road Lahore on Dec 12, **2023**.
23. Attended a webinar on "Tau protein aggregation & neurodegenerative disease" by Wiley on December 07, **2023**.
24. Participated in a webinar on "CO<sub>2</sub> storage, magic doors and machine learning" by Preferred Computational Chemistry on November 22, **2023**.
25. Took part in a webinar "Enabling 2D and 3D Image-Based Oncology Applications using Agilent Microplates" by Wiley Analytical Science Fall 2023 Conference on November 16, **2023**.
26. Took part in a webinar "Flex Your mAbs: LCMS Characterization of Charge Variants from MauriceFlex™" by Wiley Analytical Science Fall 2023 Conference on November 15, **2023**.

## Dr. Gulzar Muhammad

27. Attended "How to Become More Sustainable in the Lab - Approaches, Tips and Tricks" by The Life Science Business of Merck KGaA, Darmstadt, Germany on November 15, **2023**.
28. Attended a webinar on "From Lab to Market: Accelerating Next Generation Battery Development with Plasma FIB-SEM and TOFSIMS Workflows" by Wiley Analytical Science on November 14, **2023**.
29. Participated in a webinar on "Linking microstructures to physical properties: advanced failure analysis using correlative mechanical microscopy" by Oxford Instruments on November 9, **2023**.
30. Took part in a webinar "Measuring PFAS in Air using Thermal Desorption Gas Chromatography Mass Spectrometry" by Wiley Analytical Science Fall 2023 Conference on November 8, **2023**.
31. Took part in a webinar "Intelligent LC/MS tools for quantitation and characterization of biopharmaceuticals" by Wiley Analytical Science Fall 2023 Conference on November 7, **2023**.
32. Completed three modules on "Workshop: Your guide to solving complex problems by mastering Design of Experiment" by Royal Society of Chemistry on October 17-19, **2023**.
33. Participated in Schrödinger's webinar on "Using crystallographic structures & data-driven solutions to advance drug design" by Chemistry World on October 11, **2023**.
34. Participated in Schrödinger's webinar on "Data-driven materials innovation: where machine learning meets physics" by Chemistry World on October 10, **2023**.
35. Attended a webinar on "Novel Approaches in Organic Synthesis" by Merck on October 10, **2023**.
36. Attended a webinar on "Analysis of Impurities in Pharmaceuticals Using Ion Chromatography" by European Pharmaceutical Review on October 4, **2023**.
37. Attended a webinar on "Implementing continuous flow technologies in commercial manufacturing" by European Pharmaceutical Review on September 27, **2023**.
38. Participated in training webinar on "Innovating for the future of sustainable labs" by Royal Society of Chemistry on September 21, **2023**.

## Dr. Gulzar Muhammad

39. Delivered a lecture on "An insight into an effective research proposal and scientific writing" in Superior University Lahore, Raiwind road Lahore on September 9, **2023**.
40. Attended a virtual session on "Development of Catalytic Processes for the Conversion of Biomass into Value-Added Chemicals" by Micromeritics on September 6, **2023**.
41. Presented talks on "Our education system and bloom taxonomy" to chemistry teachers of The Superior Group from all cities of Punjab (July 31, **2023**, to August 12, **2023**).
42. Participated in a teacher training programme on "Advanced teaching and learning programme 2023" by QEC, Government College University, Lahore (July 17, **2023**, to August 16, **2023**).
43. Attended and presented talks in four weeks of training on "Training of Teachers in Special Education Learning Differences and Learning Disabilities" hosted by Oakland University, Rochester, USA (May 5, **2023**, to June 02, 2023).
44. Attended a virtual session on "Automating the Laboratory: Maximizing Efficiency Through Smart Solutions" by Wiley Analytical Science Spring Conference on April 27, **2023**.
45. Attended a virtual session on "Advancing Characterization of Materials by Multimodal 4DSTEM Analytical Methods" by Wiley Analytical Science Spring Conference on April 26, **2023**.
46. Participated in training on "Benchtop NMR: enhancing pharmaceutical development, scale-up and manufacturing" by European Pharmaceutical Review on April 26, **2023**.
47. Attended webinar on "Characterizing Advanced Battery Anodes with Gas Adsorption BET Surface Area and DFT Surface Energy" by Micromeritics on April 25, **2023**.
48. Took part in webinar on "Specific Heat Capacity Determination by DSC" by Wiley Analytical Science Spring Conference on April 19, **2023**.
49. Attended a webinar on "Powder Flow Characterization for Optimizing Processes in Industry and Research" by Micromeritics on April 11, **2023**.
50. Attended webinar on "Uranus: exploring the ice-cold chemistry of the 'frozen frontier" by Chemistry World Webinars on April 4, **2023**.

## Dr. Gulzar Muhammad

51. Participated in training webinar on "Optimizing Yield for Li-Ion Battery Electrode Manufacturing for Both Wet and Dry Processes" on March 29, **2023**, by Micromeritics.
52. Attended a webinar on "Introduction to energy dispersive spectrometry (EDS)" on March 23, **2023**, by Oxford instruments.
53. Acquired Advanced training on "Lithium-ion Battery Separator: Pore Structure Determination Using Mercury Intrusion Porosimetry" on March 23, **2023**, by Micromeritics Instrument Corporation.
54. Attended a lecture on "Studying protein polymerization with mass photometry" by Labroots on March 16, **2023**.
55. Attended a lecture on "Introduction to sample identification in the SEM with AZtecMatch" by Oxford instruments on March 9, **2023**.
56. Attended a webinar on "Physical Characterization Methods for Cathode Powders" by micromeritics on March 8, **2023**.
57. Attended a webinar "Introduction to Using Precision Tree: Measuring the Value of Information" by Rafael Hartke on March 5, **2023**.
58. Attended a webinar on "Robots in the lab-learn how automation can streamline your workflow" by Chemistry world webinar on Feb 27, **2023**.
59. Attended Oil and gas webinar series 5: Project portfolio analysis and optimization on February 27, **2023**.
60. Attended webinar on "Imaging deeper, Faster and with super-resolution Dragonfly 600" by Ander Technology (Oxford instruments) on Feb 23, **2023**.
61. Participated in a one-day symposium "International Symposium on Hybrid Materials for Energy Conversion and Storage" by the Functional Materials Research Group, Department of Chemistry, Government College University, Lahore, on Feb 16, **2023**.
62. Participated in a webinar on "Analytical Methods to Ensure Battery Raw Material and Electrode Performance" by Micromeritice on Feb 2, **2023**.
63. Attended webinar on "Enhancing your imaging workflows and ultrastructural data using Biological EDS" by Wiley Analytical Science on Feb 2, **2023**.
64. Attended "Virtual Organic & Medicinal Chemistry Symposium 2022" by LUMS on Dec 9, 2022.
65. Attended webinar on "nanoGPS: Correlative Microscopy Solution" by Wiley Analytical Science on Dec 8, 2022.

## Dr. Gulzar Muhammad

- 66.** Attended webinar on "Is this the future of bioplastics upcycling?" by Chemistry World Waters on Dec 1, 2022.
- 67.** Attended webinar on "Enabling a perfect research ecosystem with Science Direct at Higher Education Commission Pakistan" by Elsevier on Nov 28, 2022.
- 68.** Attended webinar on "Multiresonant Plasmonic Meshes for Bio-interfaced Surface-enhanced Raman spectroscopy Imaging and Nonlinear Nano-optics" by ANDOR Technology (Oxford instruments) on Nov 25, 2022.
- 69.** Attended webinar on "Interface of Chemistry & Biology - RSC Desktop Seminar series with Chemical Science" by RSC on Nov 25, 2022.
- 70.** Attended Wiley Analytical Science Virtual Conference on "How to Achieve Oil-Free Conditions in the Laboratory" sponsored by Pfeiffer Vacuum on Nov 17, 2022.
- 71.** Attended webinar on "Interface of Chemistry & Biology - RSC Desktop Seminar series with Chemical Science" by RSC on Nov 17, 2022.
- 72.** Attended webinar on "Multiresonant Plasmonic Meshes for Bio-interfaced SERS Imaging and Nonlinear Nano-optics" by ANDOR Technology (Oxford instruments) on Nov 17, 2022.
- 73.** Attended webinar on "Navigating the pathways of publishing in High-quality journals by using Scopus at Higher Education Commission Pakistan" by Elsevier on Nov 15, 2022.
- 74.** Attended webinar on "Interface of Chemistry & Biology" by RSC on Oct 26, 2022, 8:00 PM PKT.
- 75.** Attended one-day virtual conference on Metal Complexes for Biomedical Applications symposium (MCBA2022) by Chemistry Europe, Wiley on Mon, Oct 24, 2022, 2:50 PM - 7:10 PM PKT.
- 76.** Attended three days online workshop on "Make better data-based decisions with statistical modelling techniques" by Royal Society of Chemistry on Oct 11-13, 2022.
- 77.** Attended two days virtual conference on RSC-IITM Desktop Seminar on Environmental Sciences by Royal Society of Chemistry on Tue-Wed, Oct 11-12, 2022 2:15 PM - 5:30 PM PKT.
- 78.** Presented talks on "Academic excellence and analogy-based learning" in 11 different cities from June 21, 2022, to July 4, 2022.

## Dr. Gulzar Muhammad

**79.** Attended and presented talks in six weeks of training on "Training of Teachers in Special Education Learning Differences and Learning Disabilities" hosted by Oakland University, Rochester, USA (May 7, 2022, to June 18, 2022).

**80.** Attended a Two-day workshop on "Promoting Research Excellence in Academics across Pakistan" organized by HEC and Elsevier on 1<sup>st</sup> and 2<sup>nd</sup> February 2022.

**81.** Attended an "International Symposium on Green Chemistry and Sustainable Developments" organized by the Institute of Chemistry, University of Sargodha, Sargodha on April 01, 2022.

**82.** Presented poster (won 2<sup>nd</sup> prize) in "International Symposium on Green Chemistry and Sustainable Developments" organized by Institute of Chemistry, University of Sargodha, Sargodha on April 01, 2022.

**83.** Presented talk on "Role of Activity Based Learning in Teaching Chemistry" at Superior University organized by Superior Executive & Development Program 2020. (Feb 2020)

**84.** Presented talks on "Mastering Your Superior Skills" in 11 different Universities of Punjab organized by Superior Executive & Development Program 2019. (May 2019)

**85.** Attended an International Conference for the promotion of University-Industry Linkage, Organized by the Department of Chemistry, GC University, Lahore, 54000, Pakistan, Jan 2018.

**86.** Presented poster on *Moringa oleifera* L.: A multipurpose plant of nutraceutical importance in National Symposium on *Moringa oleifera*: Recent Trends and Challenges in Processing and Product Developments organized by Jointly organized by University of Sargodha and Punjab Agricultural Research Board (PARB) (April 09, 2018).

**87.** Presented talk on Glucuronoxylan polysaccharide mediated green synthesis of silver nanoparticles for antimicrobial and wound healing applications in 1<sup>st</sup> GRIP's International Conference on Pharmaceutical and Biochemical Sciences organized by Pak Pharma & Healthcare Expo (Jan 24, 2018).

**88.** Presented poster on Glucuronoxylan polysaccharide mediated green synthesis of silver nanoparticles for antimicrobial and wound healing applications in 1<sup>st</sup> GRIP's International Conference on Pharmaceutical and Biochemical Sciences organized by Pak Pharma & Healthcare Expo (Jan 24, 2018).

## Dr. Gulzar Muhammad

**89.** Presented talks on "Master Your Superior Profession" in 10 different Universities of Punjab organized by Superior Executive & Development Program 2018. (May 2018)

**90.** Presented talks on "Master Your Superior Profession" in 7 different Universities of Punjab organized by Superior Executive & Development Program 2017. (May 2017)

**91.** Attended a One-day symposium on "Green Chemistry: An Innovative Route to Sustainable Scientific Development". Organized by the Department of Chemistry, University of Sargodha, Sargodha 40100, Pakistan, on April 30, 2014.

**92.** Attended "One-day seminar on Functional Food and Nutraceuticals: Chemistry, Recent, Development and Future Prospects." Organized by Department of Chemistry, University of Sargodha, Sargodha 40100, Pakistan on March 20, 2013.

**93.** Attended a "Workshop on Biodiesel Technology: Processing, Potential Feedstock, Future Prospects and Challenges." Organized by Department of Chemistry, University of Sargodha, Sargodha 40100, Pakistan on Nov 5-6, 2012.

### STUDENTS SUPERVISED

PhD students supervised				
Sr. No	Roll no.	Name	Thesis Title	
1	02	Muhammad Wajid	Synthesis, Characterization and Biological Assessment of Schiff Bases of Sulfa Drugs	
2	2018-GCUL-PhD-CHEM-14	Fakhar Abbas	Pharmacological and immune stimulatory assessment of Cucumis melo and Cucumis sativus for disease management	
3	2021-GCUL-PhD-Zoo-143	Muhammad Summer	Stimulus-responsive <i>Bergenia ciliata</i> loaded <i>Salvia hispanica</i> hydrogels for accelerated wound repair	
MPhil/MS students supervised				
Sr. No	Roll no.	Name	Class	Thesis Title
1	803	Tania Saif	M.Phil	Polysaccharide-based nanoparticles as drug carriers
2	815	Umer Siddique	M.Phil	Temperature, pH and saline responsive nature of polysaccharide from plant seeds
3	818	Sayyida Hijab Fatima	M.Phil	Effect of temperature, pH and amount of seeds on the yield of hydrogel using response surface methodology
4	828	M. Nauman ur Rasheed	M.Phil	Smart tablet formulations under simulated physiological conditions for oral drug delivery system based on hydrogel
5	837	Aiza Azam	M.Phil	Microbicidal potential of zinc oxide nanoparticles using green approach

## Dr. Gulzar Muhammad

6	006	Javeria Ahmad	MS	Synthesis, characterization and application of nanoparticles for latent finger printing
7	013	Aamna Majeed	MS	Green synthesis of silver nanoparticles for latent finger printing
8	0847	Anam Khalid	M.Phil	Green Synthesis, Characterization, and Antimicrobial Potency of Ag-Fe Bimetallic Nanoparticles from <i>Alhagi Maurorum</i> Leaf Extract
9	246	Urooj Naeem	M.Phil	Therapeutic Applications of Nanoparticles Impregnated Hydrogels in Fusion with Stem Cell Conditioned Media
10	0210	Muhammad Umair Sharif	M.Phil	Copper oxide nanoparticles from <i>Cucumis sativus</i> ; synthesis, characterization, and biological applications
11	0264	Tuba	M.Phil	Therapeutic applications of nanoparticles impregnated hydrogels in fusion with Exosomes
12	0834	Falak Naz	M.Phil	Psyllium mucilage based silver nanoparticles for antimicrobial activity
13	0266	Sobia	M.Phil	Manganese oxide nanoparticles from linseed hydrogel, Green synthesis, characterization, and application in dye degradation
14	0857	Abdul Qadir Ahmad	M.Phil	Surface modified Fe/Mg nanoparticles as growth retardants of <i>Aspergillus Flavus</i>
15	0860	Muhammad Basit	M.Phil	Synthesis of Ni-doped indium selenide for electrochemical water splitting application
16	0861	Usama Abid	M.Phil	Green synthesis of NiO nanoparticles using <i>Psidium Guajava</i> leaf extract and its application in dye degradation
17	0867	Rizwan Ali	M.Phil	Synthesis of silver nanoparticles from <i>Azadirachta indica</i> fruit and its biological application
18	0271	Sabahat Zaka	M.Phil	Synthesis, characterization and dye degradation potential of silver nanoparticles from quince seed mucilage
19	0261	Manahil Noor	M.Phil	Microbicidal and wound healing potential of ZnO nanoparticles from hydrogel of <i>Mimosa pudica</i> seeds
20	0264	Momal Shakeel	M.Phil	Dye degradation potential of manganese oxide nanoparticles from Basil seed mucilage
21	0806	Alina Arif	M.Phil	Synthesis and characterization of CuO nanoparticles from <i>Plantago ovata</i> seeds mucilage and its application in drug delivery
22	0849	Fehmida	M.Phil	Evaluation of wound healing and antimicrobial activity of biosynthesized silver nanoparticles from <i>Pleurospermum candollei</i> seeds
23	0204	Maria Zia	M.Phil	Green synthesis, characterization and antimicrobial activity of copper oxide nanoparticles from leaf extract of <i>Opuntia littoralis</i>
24	0246	Samrah	M.Phil	Green synthesis, characterization and antimicrobial activity of manganese oxide nanoparticles from leaf extract of <i>Opuntia littoralis</i>

## Dr. Gulzar Muhammad

25	022	Fatima Younas	MS	Green synthesis, characterization and toxic metal removal using iron oxide nanoparticles from <i>Beta vulgaris</i> peel extract
26	0802	Muhammad Rauf Raza	M.Phil	Synthesis and characterization of lanthanide-based MOFs for water splitting
27	206	Zain Fatima	M.Phil	Synthesis of NiO nanoparticles from quince seed hydrogel for environmental applications
28	245	Sehar Javed	M.Phil	Flaxseed gel-mediated synthesis of NiO nanoparticles for metal sensing and antimicrobial activity
29	204	Zarfishan Zulfiqar	M.Phil	Synthesis and characterization of CuO nanoparticles from flaxseed mucilage for photocatalytic activity and metal sensing
30	0806-MPHIL-CHEM-2023	Iqra Urooj	M.Phil	Glucuronoxyran polysaccharide-based bioflocculant extraction from quince seeds for enhanced wastewater treatment
31	0860-MPHIL-CHEM-2023	Tooba Irfan	M.Phil	Extraction of flaxseed rhamnogalacturonan-based mucilage for wastewater treatment
32	0874-MPHIL-CHEM-2023	Abdul Qayyum	M.Phil	Glucoxyran polysaccharide-based natural coagulant from <i>Mimosa pudica</i> seeds for wastewater remediation
33	0881-MPHIL-CHEM-2023	Muhammad Sohaib	M.Phil	Isolation of rhamnogalactan polysaccharide from <i>Alyssum homolocarpum</i> seeds for efficient heavy metal removal from wastewater

### BS/MSc students supervised

Sr. No	Roll no.	Name	Class	Thesis Title
1	0201	Tooba Irfan	BS	Saline responsive nature of natural hydrogel from plant seeds
2	0203	Saria Nazir	BS	Synthesis and characterization of silver nanoparticles using linseed mucilage
3	0211	Kiran Nayab Laila	BS	Synthesis and characterization of CuO nanoparticles using <i>Mimosa pudica</i> mucilage
4	0212	Iqra Urooj	BS	Isolation, characterization and salt responsiveness of hydrogel from flaxseeds
5	0216	Hamas Rahmat Qureshi	BS	Synthesis and characterization of iron oxide nanoparticles using <i>Nigella sativa</i> seed extract
6	0221	Shahmeer Javed	BS	Synthesis and characterization of copper oxide nanoparticles using mucilage from quince seeds
7	0803	Hina Shahzadi	BS	Synthesis and characterization of silver nanoparticles using <i>Aloe vera</i> mucilage
8	0211E	Ayesha Majeed	BS	Dye degradation using iron oxide nanoparticles from <i>Nigella sativa</i> seed extract
9	0213	Nimra Arif	BS	Iron oxide Nanoparticles from Sweet lime; Green synthesis, characterization, and bactericidal potential
10	0243	Zarfishan Zulfiqar	BS	Synthesis, characterization, and antimicrobial activity of iron oxide nanoparticles from orange

## Dr. Gulzar Muhammad

				juice
11	0803	Zain Fatima	BS	Antimicrobial activity of iron oxide nanoparticles synthesized from lemon juice extract using the green approach
12	0236	Maryam Naseer	BS	Dye degradation potential of iron oxide nanoparticles synthesized from apple juice extract using Green Approach
13	0259	Maryam Fareed	BS	Synthesis of nanocomposites from natural hydrogel using green approach
14	0267	M. Talha Watto	BS	Photocatalytic activity of polysaccharide based nanocomposites
15	0801	Arooj Ahmad	MSc	Free radical scavenging potential of glucuronoxylan from plant seeds
16	0803	M. Rauf Raza	MSc	Antioxidant potential of polysaccharide based silver nanoparticles
17	0808	Ashiq Hussain	MSc	Wound healing studies of silver nanoparticles synthesized using green approach
18	0815	Muhammad Shahzad	MSc	Topical application of antimicrobial metallic nanoparticles for wound healing in model animals
19	206	Rimsha	BS	In vitro antidiabetic and anti-inflammatory potential of methanolic extract of cumin seeds
20	268	Saba Shaheen	BS	Photocatalytic activity of silver nanoparticles from aqueous extract of <i>Antirrhinum majus</i> leaves
21	278	Maryam Noreen	BS	Synthesis, characterization, and antibacterial activity of silver nanoparticles using aqueous extract of <i>Lobularia maritima</i> leaves
22	284	Hayab Ameer	BS	Green synthesis of silver nanoparticles using aqueous extract of <i>Curcuma longa</i> rhizome for dye degradation
23	287	Abu Baker	BS	Photocatalytic activity of CuO nanoparticles synthesized using Linseed mucilage
24	0434-BS-CHEM-21	Iman Zahid	BS	Phytochemical profiling and in vitro antidiabetic activity of aqueous extract from <i>Melia azedarach</i> leaves
25	0478-BS-CHEM-21	Ammarah Riaz	BS	Antidiabetic and anti-inflammatory activities of aqueous extract of <i>Melia azedarach</i> roots

## REFERENCES

- 1. Dr. Muhammad Ajaz Hussain (Professor, PhD supervisor)**, Centre for Organic chemistry, School of Chemistry, University of the Punjab, Lahore, Pakistan. ([mahussain.chem@pu.edu.pk](mailto:mahussain.chem@pu.edu.pk))  
University link: <http://pu.edu.pk/faculty/description/2580/Prof-Dr-Muhammad-Ajaz-Hussain.html>
- 2. Dr. Zahid Shafiq (Professor, Master's research supervisor)** Institute of Chemical Sciences, Bahauddin Zakariya University Multan, Pakistan. ([zahidshafiq@bzu.edu.pk](mailto:zahidshafiq@bzu.edu.pk))

## Dr. Gulzar Muhammad

University link: [https://bzu.edu.pk/view\\_faculty.php?facultyID=323](https://bzu.edu.pk/view_faculty.php?facultyID=323)

**3. Dr. Muhammad Sher (Professor)**, Director, Institute of Chemistry, University of Sargodha, Sargodha, Pakistan. ([muhammad.sher@uos.edu.pk](mailto:muhammad.sher@uos.edu.pk))

University link: <https://su.edu.pk/facultyprofile/147>