

Curriculum Vitae of

Prof. Dr. Qurra-tul-Ann Afza Gardner

Institute (and Postal address): School of Biological Sciences,
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Date of Birth: 13-09-1980



ACADEMIC QUALIFICATION

	University	Subject	Specialization	Period
Ph.D.	Supervisor: Prof M Akhtar FRS University of Punjab, Lahore	Biological Sciences	Biochemistry. Thesis: Studies on the Production of Recombinant Human Insulin and its Precursors	2003 - 2009
Post Doctorate	1. Supervisor: Prof M Akhtar FRS, University of Punjab, Lahore.	Biological Sciences and Mass Spectrometry	Molecular biology, Biological mass spectrometry and biochemistry	Dec 2009 – May 2011
	2. Supervisor: Prof. Anne Dell CBE FRS FmedSci, Imperial College, London, UK	Biological Mass Spectrometry	Proteomics and Glycoproteomics	Aug – Oct 2010, and Aug – Oct, 2011
	3. Supervisor: Dr PT Williamson, University of Southampton, UK	Molecular and structural Biology	Molecular and structural elucidation of fibrils	July – Aug 2013 and July – Aug 2015

- **M.Sc. in Biochemistry**, 2000–2002 (1st Division), from Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore. **Thesis:** Evaluation of thyroïdal disorders during pregnancy.
- **B.Sc.** (Pre-medical; Zoology, Botany & Chemistry), 1998–2000 (1st Division), Lahore College for Women, Lahore
- **F.Sc.** (Pre-medical; Biology, Chemistry, Physics), 1998, (1st Division), Lahore College for Women, Lahore
- **Senior Cambridge** (Biology, Chemistry, Physics), 1995 (19 Grade) from Cathedral High School, Hall Road, Lahore

CURRENT POSITION: (3rd May 2023, to-date) Presently working as Tenured Professor in Biological Mass Spectrometry and Biochemistry, in School of Biological Sciences, University of the Punjab, Quaid-e-Azam Campus, Lahore.

PREVIOUS SERVICE RECORD

- **Tenured Associate Professor:** In School of Biological Science (SBS PU), 31- 08- 2018 to 02- 05-2023
- **Assistant Professor (TTS):** In School of Biological Science (SBS PU), 15- 11- 2011 to 30-08- 2018
- **Senior Experimental officer (BS-19):** (2nd June-14th November 2011), in biological mass spectrometry, SBS, PU.
- **Post-doctorate: (December 2009 – May 2011),** in Mass Spectrometry in SBS, PU.

- **Research Officer: (June – December 2009), as a Mass spectrometrists in SBS, PU.**

Research Experience and Accomplishments

I am a biologist with specialisation in biochemistry and biological mass spectrometry. Presently, I am working as Tenured Professor in School of Biological Sciences, University of the Punjab, Quaid-e-Azam Campus, Lahore and one of the youngest professor in Punjab University. I did my Ph.D. in biochemistry under the supervision of Prof M Akhtar FRS, in 2009. My Ph.D. thesis entitled “Studies on the Production of Recombinant Human Insulin and its Precursors” which highlighted the possible solutions to overcome the problems involved in the production of biologically active insulin.

I did my Post-doctorate in mass Spectrometry and proteomics with Prof M Akhtar FRS and part of my post-doctoral training was done at Imperial College, London, UK, under the supervision of Prof. Anne Dell CBE FRS FmedSci. I also worked as a visiting Scientist and International collaborator with Dr PT Williamson at University of Southampton, UK on structural elucidation of fibrils using insulin as a model protein.

My research focuses on the production and characterization of clinically important proteins which include amyloid related proteins, insulin, proinsulin, interferon, various clinically important enzymes and bacterial proteins having bioinsecticidal potential. Apart from this, I have gained expertise in studying raising the antibodies of these proteins in animals and the structural elucidation of these biomolecules by employing mass spectrometry. Parallel studies of our group on interferon α -2 have greatly benefitted from my experience of protein mass spectrometry which led to production interferon with enhanced biological activity. My research has contributed to the development of mass spectrometric and structural biology field in Pakistan along with the production of biopharmaceutically important proteins.

Due to my experience in mass spectrometry and competency, BRUKER DALTONIKS (GmbH) has supported the upgrading of current MALDI mass spectrometer in my institute for biotyping of clinical and environmental samples i.e. identification of microorganisms by MALDI finger printing. This is the first ever set-up of MALDI biotyping in Pakistan for the quick identification of microorganisms by MALDI mass spectrometry.

I have collaborations with different universities, institutes and hospitals on various proteomics related and MALDI biotyping problems. I am fully involved in teaching various M. Phil. and Ph.D. courses and conducting examinations.

As an in charge of mass spectrometric facilities, I am rendering my services to various researchers on various mass spectrometric related problems and keeping the mass spectrometers alive in my institution. I work on developing various protocols for difficult to analyse biological proteins and post-translational modification by advanced proteomics techniques using MS/MS analysis.

I am fully involved in various departmental advisory and administrative duties, among which the most important is being in charge of core biophysical facilities. This includes the maintenance, providing central mass spectrometric and radioactive laboratory as a radiation protection officer.

AWARDS/ HONOUR

- HEC approved supervisor for conducting PhD research since April 2012.
- Grants awarded: Please see grants awarded section
- Visiting faculty member, in Undergraduate block, University of Punjab, teaching, BS honours Chemistry
- First MALDI biotyper in Pakistan, in collaboration with Bruker (GmbH) and Rays Technologies.
- Ph.D. fellowship in School of Biological Sciences, University of the Punjab, Lahore (2003 – 2008).
- Post-doctoral fellowship in School of Biological Sciences, University of the Punjab, Lahore

(December 2009 – May 2011).

- HEC funded training abroad in mass spectrometry in Imperial College London for six months under the supervision of Prof Anne Dell CBE FRS FmedSci (August – October, 2010 and August – October, 2011).
- As a Guest Mass Spectrometrists Speaker in various mass spectrometry workshops
- M.Sc. Scholarship from Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore (2002).
- Scholarship from Lahore College for Women, Lahore (2001).
- President's Talent Scholarship from University Grants Commission (UGC) (1999).

GRANTS

Sr. no.	Title of project	Status	Role	Initiation date	Completion date	Amount	Funding source(s)
1	HEC grant on the maintenance of the mass spectrometer MALDI TOF/TOF (HEC ref no. 1-12 (07)/ MSE/ R & D/ HEC/ 2014).	Completed	Principal investigator	Award letter on 11 th March, 2014	Consolidated report was submitted on 18-4-16	Rs. 1.0 million	HEC Islamabad, Pakistan
2	Rapid refolding of recombinant human insulin derivatives and their structural elucidation by proteomics.	Completed	Principal investigator	Notification Award letter No. D/4112/Est: I Dated 13-9-17, Sr. No. 107	August 2018	Rs. 0.15 million	University of the Punjab, Quaid-e-Azam campus, Lahore.
3	Studies on serum amyloid-P component in relation to its binding with physiologically important fibril-forming proteins	Completed	Principal investigator	Awarded (4-2-19)	December 2023	Rs. 2.543374	HEC NRPU
4	Studies on the half-life of genetically engineered human interferon derivatives	Completed	Principal investigator	December 2022-23	May 2023	Rs. 0.25 million	University of the Punjab, Quaid-e-Azam campus, Lahore.

PUBLICATIONS

Total no. of publications 32

No. of international publications in impact factor journals =29

Total Impact factor: 70.907

Total Citations: 224

1. Structural engineering and truncation of α -amylase from the hyperthermophilic archaeon *Methanocaldococcus jannaschii*. Shad, M., Sajjad, M., **Gardner, Q.A.**, Ahmad, S., Akhtar, M. W. *International Journal of Biological Macromolecules*, 226 (part 1)128387. Jan 2024. <https://doi.org/10.1016/j.ijbiomac.2023.128387> **Impact factor 8.2**
2. Toxicity of *Lysinibacillus sphaericus* Q001 S-layer protein against *Culex quinquefasciatus* and *Anopheles stephensi* larvae. Arshad, H., Waris, M. and ***Gardner, Q.A.** *Pakistan Journal of Zoology*, pp 1 -6. 2023. DOI: <https://dx.doi.org/10.17582/journal.pjz/20230406110459> **Impact factor 0.687** (*As a corresponding author).
3. Preparation and biological evaluation of radio conjugated cephradine complex for infection imaging. Zahoor, R., Munawar, A., Abbas, K., Shahid, A., **Gardner, Q.A.** and Khan, I. U. *Pakistan Journal of Pharmaceutical Sciences*, 36 (1): 181-189. 2023. doi.org/10.36721/PJPS.2023.36.1.REG.181-189.1 **Impact factor 0.863**
4. Structural-Functional Characterization of Cytochrome b in bc1 and b6 f Complexes along with Polymorphic Analysis. Shad, M., Usman, M., and ***Gardner, Q.A.** *Pakistan Journal of Zoology*, pp 1 -12. 2022. DOI: <https://dx.doi.org/10.17582/journal.pjz/20220428110433>. **Impact factor 0.687.** (Citations 4). (*As a corresponding author).
5. Proteomic profile mapping and differential expression of protein in ovarian cancer. Tauseef, A., Karim, A., Ahmad, G., **Gardner, Q. A.**, and Akhtar, M. W. *Sains Malaysiana*, 50 (12): 3667 – 3681. December 2021. <http://doi.org/10.17576/jsm-2021-5012-17> **Impact factor 1.009**
6. Characterization of venom components of two medically important scorpion species, *Hottentota tamulus* (Fabricius, 1798) and *Androctonus finitimus* (Pocock, 1897). Tahir, H. M., Tobassum, S., Ali, S., Zahid, M. T., Arshad, M., **Gardner, Q. A** and Ahsan, M. M. *Journal of the Kanas Entomological society*, 93 (3): 230-245. May 2021. <https://doi.org/10.2317/0022-8567-93.3.230> . **Impact factor 0.292.** (Citation 1)

7. Tubulin beta 2C chain (TBB2C), a potential marker of ovarian cancer, an insight from ovarian cancer proteome profile. Shahzadi, N., Safa, A., Tahira, T., **Gardner, Q. A.** and Akhtar, M.W. *ACS Omega (American Chemical Society Omega)*, **6**: 10506-10514. April 2021. <https://dx.doi.org/10.1021/acsomega.0c03262>. **Impact factor 3.512** (Citations 5)
8. Association of hypertension and BMI in polycystic ovarian syndrome in non-obese Asian women. Akram, T., Tauseef, A., **Gardner, Q. A.**, Qamar, M., Javed, S. and Fatima, S. A. *Annals of international medical and dental research*, **6** (5): 5 – 8. September 2020. [Doi:http://dx.doi.org/10.21276/aimdr](http://dx.doi.org/10.21276/aimdr) (International Non-impact factor journal)
9. Boronic Acid Functionalized Fibrous Cellulose for the Selective Enrichment of Glycopeptides. Sajid, M.S., Jabeen, F., Hussain, D., **Gardner, Q.A.**, Ashiq, M. N. and Najam-ul-Haq. M. *Journal of Separation Science*, **43** (7): 1348 – 1355. April 2020. <https://doi.org/10.1002/jssc.201900983> **Impact factor 2.878** (Citations 16)
10. Up-regulated expression of calcium dependent Annexin A6: A potential indicator of ovarian carcinoma. Noreen, S., **Gardner, Q.A.**, Fatima, I., Sadaf, S. and Akhtar, M. W. *Proteomics Clinical Applications*, **14**(2): e1900078: 1-9. March 2020. <https://doi.org/10.1002/prca.201900078>. **Impact factor 2.489**. (Citations 11)
11. Bioactivity-Guided Isolation and Identification of Anti-adipogenic Constituents from n-Butanol Fraction of *Cissus quadrangularis*. Toor, R. H., Khan, Z. N., Tariq, M., Tasadduq, R., **Gardner, Q.A.**, Zaman, W-U., Lian, J. B., Stein, J. L., Stein, G. S. and Shakoory A. R. *Critical Reviews™ in Eukaryotic Gene Expression*, **30** (6): 519- 541. Jan 2020. [DOI: 10.1615/CritRevEukaryotGeneExpr.2020036843](https://doi.org/10.1615/CritRevEukaryotGeneExpr.2020036843). **Impact factor 2.156**. (Citations 4)
12. Exploring the nature of inclusion bodies by MALDI mass spectrometry using recombinant proinsulin as a model protein. ***Gardner Q.A.**, Hassan, N., Hafeez, S., Arif, M., Akhtar, M. *International journal of Biological Macromolecules*. 139:647-653. October, 2019. doi: 10.1016/j.ijbiomac.2019.07.131. **Impact factor 5.162**. (***As a corresponding author**) (Citations 2)

13. Mechanistic studies on *Pyrobaculum calidifontis* porphobilinogen synthase (5-aminolevulinic acid dehydratase). Azim, N., **Gardner, Q.A.**, Rashid, N., Akhtar, M. *Bioorganic Chemistry*, 91:103117. **October, 2019**. doi: 10.1016/j.bioorg.2019.103117. **Impact factor 4.831** (Citations 2)
14. Effect of milking method, diet, and temperature on venom production in scorpions. Tobassum, S., Tahir, H. M., Zahid, M.T., **Gardner, Q.A.** and Ahsan, M. M. *Journal of Insect Science*, **18(4): 19; 1–7**. September, 2018. doi: [10.1093/jisesa/iev081](https://doi.org/10.1093/jisesa/iev081). **Impact factor 1.446** (Citations 21)
15. Preventing the N-terminal processing of human interferon α -2b and its chimeric derivatives expressed in *Escherichia coli*. Ahsan, F., **Gardner, Q. A***, Rashid, N., Towers, G. J., and Akhtar, M*. *Bioorganic Chemistry*, **76: 294–302**. 2018. (***As a corresponding author**). doi: [10.1016/j.bioorg.2017.11.016](https://doi.org/10.1016/j.bioorg.2017.11.016). **Impact factor 3.929**. (Citations 7)
16. Complete signal peptide of Tk1884, an α -amylase from *Thermococcus kodakarensis*, is not necessary for extracellular secretion of the enzyme by *Escherichia coli*. Muhammad, M. A., Falak, S., Rashid, N., Ahmed, N., **Gardner, Q.A.**, Tariq, A., and Akhtar, M. *Amylase*, 1: 75–81. 2017. [DOI 10.1515/amylase-2017-0007](https://doi.org/10.1515/amylase-2017-0007). (Citations 3)
17. Synthesis of novel 5- (aroylhydrazinocarbonyl)escitalopram as cholinesterase inhibitors. Nisa, M-U., Munawar, M.A., Iqbal, A., Ahmed, A., Ashraf, M., **Gardner, Q.A.**, Khan, M.A. *European Journal of Medicinal Chemistry*, **138: 396 – 406**. 2017. <https://doi.org/10.1016/j.ejmech.2017.06.036>. **Impact factor 4.816** (Citations 21)
18. Designing structural-motifs for the preparation of acylated proinsulin and their regiospecific conversion into insulin modified at Lys²⁹ (K²⁹). Ahmad, M., **Gardner, Q. A***, Rashid, N., and Akhtar, M*. *Bioorganic Chemistry*, **73: 147-153**. 2017. (***As a corresponding author**). <https://doi.org/10.1016/j.bioorg.2017.06.005> **Impact factor 3.929**. (Citations 2)
19. *Escherichia coli* Signal peptidase recognizes and cleaves archaeal signal sequence. Muhammad, M. A., Falak, S., Rashid, N., **Gardner, Q.A.**, Nasir Ahmad, Imanaka, T. and Akhtar M. *Biochemistry (Moscow)*, **82: 821 – 825**. 2017. [DOI: 10.1134/S0006297917070070](https://doi.org/10.1134/S0006297917070070). **Impact factor 1.724**. (Citations 4)

20. Pcal_1699, an extremely thermostable malate dehydrogenase from hyperthermophilic archaeon *Pyrobaculum calidifontis*. Gharib, G., Rashid, N., Bashir, Q., Gardner, Q. A., Akhtar, M. and Imanaka, T. *Extremophiles*, 20:57–67. 2016. [DOI: 10.1007/s00792-015-0797-3](https://doi.org/10.1007/s00792-015-0797-3). Impact factor 2.306 (Citations 24)
21. Hierarchy of N-acylation sites in human insulin studied by RP-HPLC and mass Spectrometry. Zain, H., Ahmad, M., Gardner, Q. A. and Akhtar, M. *Journal of Chemical Society of Pakistan*, 37 (6): 1260 - 1266. 2015. [http://www.jcsp.org.pk/PublishedVersion/10200472-7be8-4a1b-9e89-2cc40e06ce4aManuscript%20no%2024,%20Final%20Gally%20Proof%20of%2010832%20\(Muhammad%20Akhtar\).pdf](http://www.jcsp.org.pk/PublishedVersion/10200472-7be8-4a1b-9e89-2cc40e06ce4aManuscript%20no%2024,%20Final%20Gally%20Proof%20of%2010832%20(Muhammad%20Akhtar).pdf). Impact factor 0.345. (Citations 2)
22. Production of human interferon alpha-2b in *Escherichia coli* and removal of N-terminal methionine utilizing archaeal methionine aminopeptidase. Arif, A., Gardner, Q. A., Rashid, N. Akhtar, M. *Biologia*, 70: 982–987. 2015. <https://doi.org/10.1515/biolog-2015-0113> Impact factor 0.827 (Citations 8)
23. Characterization and bioassay of post-translationally modified interferon alpha-2b expressed in *Escherichia coli*. Ahsan, F., Arif, A., Mahmood, Nasir., Gardner, Q. A., Rashid, N. and Akhtar, M. *Journal of Biotechnology*, 184: 11 – 16. 2014. <https://doi.org/10.1016/j.jbiotec.2014.05.001> Impact factor 2.871 (Citations 17)
24. Studies on the regioselectivity and kinetics of the action of trypsin on proinsulin and its derivatives using mass spectrometry. Gardner, Q. A*, Younas, H. and Akhtar, M., *Biochimica et Biophysica Acta (Proteins and Proteomics)*, 1834: 182-190. 2013. (*As a corresponding author.) <https://doi.org/10.1016/j.bbapap.2012.09.004> Impact factor 3.191 (Citations 20)
25. Studies on the expression and processing of human proinsulin derivatives encoded by different DNA constructs. Aslam, F., Gardner, Q. A., Zain, H., Nadeem, M. S., Ali, M., Rashid, N. and Akhtar, M., *Biochimica Biophysica Acta (Proteins and Proteomics)*, 1834: 2116-2123. 2013. <https://doi.org/10.1016/j.bbapap.2013.07.002> Impact factor 3.191 (Citations 11)
26. TK1299, a highly thermostable NAD(P)H oxidase from *Thermococcus kodakaraensis* exhibiting higher enzymatic activity with NADPH. Nisar, M. A., Rashid, N., Bashir, Q., Gardner, Q. A., Shafiq, M. H. and Akhtar, M., *Journal of Bioscience and Bioengineering*, 116: 39-44. 2013. <https://doi.org/10.1016/j.jbiosc.2013.01.020> Impact factor 1.869 (Citations 14)

27. First cloning and characterization of aspartate aminotransferase from river buffalo (*Bubalus bubalis*). Nadeem, M. S., Rashid, N., Iqbal, M., **Gardner, Q. A.** and Akhtar, M., 2011. *Biologia*, **66**: 1202 -1210. [DOI: 10.2478/s11756-011-0125-z](https://doi.org/10.2478/s11756-011-0125-z) Impact factor 0.557 (Citations 6)
28. Conformational transmission in proinsulin and its derivatives: A study using H/D exchange. Younas, H¹., **Gardner, Q. A¹**., Rashid, N., Wright, J. N. and Akhtar, M., *Internatinal Journal of Mass Spectrometry*, **302**: 36-43. (¹Both authors contributed equally, and shared first authorship). 2011. <https://doi.org/10.1016/j.jjms.2010.07.020> Impact factor 2.549 (Citations 2)
29. Gene cloning and characterization of glycine oxidase from newly isolated *Bacillus subtilis* strain R5. Jamil, F., Rashid, N., **Gardner, Q. A.** and Akhtar, M. *Biologia*, **66**:1-7. 2011. [DOI: 10.2478/s11756-010-0141-4](https://doi.org/10.2478/s11756-010-0141-4) Impact factor 0.609. (Citations 1)
30. Mechanistic and stereochemical studies of glycine oxidase from *Bacillus subtilis* strain R5. Jamil, F., **Gardner, Q. A.**, Bashir, Q., Rashid, N. And Akhtar, M., *Biochemistry*, **49**: 7377-7383. 2010. [DOI: 10.1021/bi100553n](https://doi.org/10.1021/bi100553n) Impact factor 3.226 (Citations 10)
31. Inventory of 'slow exchanging' hydrogen atoms in human proinsulin and its derivatives: observations on the mass spectrometric analysis of deuterio-proteins in D(2)O. **Gardner, Q. A.**, Younas, H., Rashid, N., Wright, J. N. and Akhtar, M., *Biochimica et Biophysica Acta (Proteins and Proteomics)*, **1794**: 1224-1233. 2009. <https://doi.org/10.1016/j.bbapap.2009.03.007> Impact factor 2.48. (Citations 5).
32. Effect of pregnancy on thyroid profile reference ranges. **Gardner, Q. A.**, Mehmood, S., Younis, N., Aurangzeb, N. and Zaheer, F., *Pakistan Journal of Biochemistry and Molecular Biology*. (ISSN # 1681-4525), **36**: 120 – 127. 2003.

Gene Sequences submitted in GENBANK

1. *Bacillus thuringiensis* strain QH002 16S ribosomal RNA gene, partial sequence. Accession No. GenBank: OR511863. Arshad,H., **Gardner,Q.A.** and Akhtar, M.2023. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/OR511863.1>
2. *Lysinibacillus sphaericus* strain Q001 16S ribosomal RNA gene,partial sequence. Accession No. GenBank: OQ701385. **Gardner,Q.A.**, Bukhari,S.S., Arshad,H., Ahmad,S., Waris,M. and Akhtar,M. 2023. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/OQ701385.1>

3. *Staphylococcus aureus* strain LTH-uvas penicillin binding protein 2A(mecA) gene, partial cds. Accession No. GenBank: MN172418. Saeed, A., Ahsan, F., Nawaz, M., Rehman, K. U., Ahmad, M. U., Mustafa, A., Iqbal, K., Jamil, M. and **Gardner, Q. A.** 2019. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/MN172418.1>
4. *Bubalus bubalis* serum amyloid A precursor (saa-1) mRNA, complete cds. Accession No. KM016696. Yaqoob, C., Akhtar, M. and **Gardner, Q. A.**, 2014. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/KM016696>
5. *Bos taurus* proinsulin mRNA, partial cds. Accession No. JX041514.1 . Aslam, F., Younis, H., **Gardner, Q. A.**, Rashid, N. and Akhtar, M. 2012. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/JX041514.1>
6. Synthetic construct hpi gene for human M-proinsulin, complete cds. Accession No. AB501190. **Gardner, Q. A.**, Younas, H., Rashid, N. and Akhtar, M., 2009. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/AB501190>
7. *Bubalus bubalis* bpi mRNA for proinsulin, partial cds. Accession No. AB234871. Akhtar, M., Rashid, N., Younas, H., **Gardner, Q. A.** and Aslam, F., 2006. NCBI GenBank Resource, <https://www.ncbi.nlm.nih.gov/nuccore/AB234871>

RESEARCH SUPERVISION

M.Phil. Thesis Supervised: 19

M. Phil. supervision under progress: 01

Ph.D. Supervision completed: 2

Ph.D. Supervision in progress: 4

Ph.D. thesis under evaluation process = 1

M. Phil. COMPLETED: Following students successfully completed their M. Phil theses under my supervision:

1. Ukasha Tahir 2023: Effect of cytochrome b5 on the half-life of recombinant human interferon derivatives

2. Nimra Asghar Bajwa 2023: *In vitro* formation of insulin fibrils and their characterization

3. Sabahat Gulzar 2022: Comparative half-life of human interferon alpha-2b derivative under *in vitro* and *in vivo* conditions

4. Amna Kainaat 2021: Evaluation of immunogenic properties of human alpha-2b interferon derivatives.

5. Hafiza Madeeha Khan 2021: Expression and refolding of human alpha-2b interferon tagged with cytochrome b₅ at N- and C-termini.

6. **Sana Samson 2020:** Effect of cytochrome b5 on the *in vitro* refolding of proinsulin derivatives.
7. **Rida Fatima 2020:** Effect of cytochrome b5 on the *in vitro* refolding of interferon derivatives and their characterization.
8. **Noor-ul-Ain 2020:** *In vitro* refolding of human interferon alpha-2b derivatives and their characterization.
9. **Sitara Nasar 2018:** Genetic engineering and characterization of a novel human cytochrome b5-proinsulin chimera.
10. **Saira Ahmad 2018:** Optimization for the preparation of insulin acyl derivatives and their specificity for carboxypeptidase B
11. **Syeda Sadia Bukhari 2018:** First studies on the identification of microorganisms in Pakistan by MALDI biotyping.
12. **Samrah Munir 2018:** Studies on the cross-reactivity of insulin and its precursors against antibodies related to insulin.
13. **Sara Ajmal 2018:** Studies on the fibril formation of insulin derivatives
14. **Sana Muqaddas 2017:** Preparation and characterization of recombinant LISPRO human proinsulin and its derivatives
15. **Ayesha Talib 2017:** Expression, Purification and Characterization of bubaline (*Bubalus bubalis*) serum amyloid A
16. **Hamayun Arshad 2016:** Comparative studies on the characterization of full-length and truncated bubaline serum amyloid-A derivatives.
17. **Chandni yaqoob 2014:** Cloning and expression of buffalo (*Bubalus bubalis*) serum amyloid A.
18. **Shakir Hafeez 2012:** Preparation of genetically engineered human proinsulin and its characterization.
19. **Muhammad Arif 2012:** *In vitro* refolding of recombinant human proinsulin using *Escherichia coli*, cytoplasmic system.

Ph.D. Students:

Ph. D. thesis under evaluation process:

- **Hamayun Arshad (2023):** Characterisation of Surface layer proteins from local bacterial isolates
- **PhD completed:**
 1. **Nadia Hassan (2019):** Studies on the genetically engineered derivatives of human insulin precursors
 2. **Munir Ahmad (2015):** Optimization of conditions for the folding and bioprocessing of different derivatives of human insulin.

- **PhD in progress:**

1. **Saira Ahmad (2019):** (researcher in NRP grant awarded, 2019): Studies on fibrillation properties of serum amyloid A and insulin derivatives
2. **Ms. Sana Batool (2023):** Studies on serine proteases from bacterial source.
3. **Areeba Shahzadi (2023).** Genetic engineering and characterization of serum amyloid A

MASS SPECTROMETRIC TRAINING COURSES

1. ***Post-doctoral experience abroad as a biological mass spectrometrist*** (Aug – Oct 2010, and Aug – Oct, 2011): During my post-doctoral research I was offered a scholarship for the advanced training abroad on mass spectrometry funded by HEC for six months My research on glycoproteomics, in **Imperial College, London, UK**, under the supervision of **Prof. Anne Dell CBE FRS FmedSci**, was concerned with the finding of glycan modifications in various mutants of *Solfolobus acidocaldarius* and *Solfolobus solfataricus* by LC-MALDI MS MS and interpreting the offline and online-LC MS MS data for the N-glycosylation mapping of S-layer in these microorganisms.
2. MALDI-BIOTYPING training with the Bruker Daltonik GmbH Autoflex III TOF/TOFTM from 2nd –5th May, 2017 organized in School of Biological Sciences, University of the Punjab, Lahore and Rays Technologies.
3. MALDI-TOF-MS MS Advanced training with the Bruker Daltonik GmbH Autoflex III TOF/TOFTM from 14th – 16th June, 2011 in Bremen, Germany, supported by Rays Technologies.

4. Agilent LCMS Time-of-Flight training at NUS Singapore MIT Alliance for Research and Technology from 21st – 25th September, 2009, supported by School of Biological Sciences, University of the Punjab, Lahore.
5. MALDI–TOF–MS Operator training course 'Proteomics' with the Bruker Daltonik GmbH Autoflex III TOF/TOFTM from 19th –21st May, 2008 in Bremen, Germany, supported by School of Biological Sciences, University of the Punjab, Lahore and Rays Technologies.
6. Basic training course of MALDI–TOF (Voyager) organized in School of Biological Sciences by ABI Biosystems conducted by Alek Doley (Application engineer of ABI Biosystems) in Jan 2007.

ADMINISTRATIVE/ADVISORY DUTIES

Administrative:

1. In Charge Core Mass Spectrometric laboratory
2. Radioactive laboratory officer

Advisory:

1. Member of the Board of Faculty of Life Sciences
2. Associate / Life-time member of Medical Microbiology and Infectious diseases society of Pakistan (MMIDSP)
3. Member of SBS departmental tenured-track committee
4. Reviewed papers as an international reviewer for various international journals; Rapid communication in mass spectrometry, Pakistan Journal of Zoology, Biomedical Chromatography, Process Biochemistry.
5. Member of departmental doctoral programme committee
6. Convener of departmental technical a
7. Member of departmental purchase committee
8. Member of departmental library committee
9. Member of the departmental loan committee
10. Assistant superintendent of SBS-girls hostel for the period May 2015 – May 2016.

TEACHING EXPERIENCE

I am also involved in teaching various Ph. D. and M.Phil. in my parent department SBS, whereas in Punjab University undergraduate department I have served as a visiting faculty member since August 2017, and taught biochemistry course (theory and practical 3+1 credit hour course) in BS honours chemistry. I am also fully engaged in conducting admission and examinations in my parent department.

Present courses being taught

Class	University/ Department	Semester	Course No.	Credit hours	Course Title	Period
Ph.D.	School of Biological Sciences, PU, Lahore	2 nd	704	2	Protein Structure and Engineering Module	2011- to date
Ph.D.	School of Biological Sciences, PU, Lahore	1 st	705	2	Current techniques in biological sciences: Mass Spectrometry	2017- to date
M. Phil.	School of Biological	1 st	502	2	Physicochemical	2011-

	Sciences, PU, Lahore				principles of proteins and enzymes	to date
M. Phil.	School of Biological Sciences, PU, Lahore	2 nd	508	1	Analytical and mechanistic enzymology	2011- to date
M. Phil.	School of Biological Sciences, PU, Lahore	2 nd	507	2	Metabolic pathways and integration	2012- to date

- **Designed Ph.D. Enzymology syllabus for King Edward Medical University**

Course Title: BMS_KEMU 506 Enzymology (2.5 credit hours).

Classes were taken at SBS training laboratory. The course was conducted in November 2016 in

SBS in collaboration with Dr. Tania Shakoori (Assistant Professor, K.E. Medical College).

- **GRE examination preparation experience**

I am fully involved in the preparing the students for GRE examination and served as an assistant superintendent with Prof Naeem Rashid (senior superintendent) in conducting GRE exam in School of Biological Sciences, since, 2012.

I try my level best that my teaching methodology is interactive and students are fully involved during their course. The aim of my teaching is to develop an understanding of the subject being taught so that they can develop the ability and skill to solve the GRE based questions.

WORKSHOPS

- Organizer and an instructor in National Workshop on Production and Purification of Recombinant proteins (13th – 17th November, 2023), School of Biological Sciences, University of the Punjab, Lahore
- Member of organizing committee of **International Conference on Advances in Biological Sciences (ICABS 6th – 8th March, 2023)**, at SBS , PU
- Organizer and an instructor in National Workshop on Production and Purification of Recombinant proteins (11th – 16th November, 2019), School of Biological Sciences, University of the Punjab, Lahore.
- Attended International Workshop on Radiation Biotechnology Applied Radioisotope (21st – 23rd October, 2019) at Pakistan Institute of Engineering and Applied Sciences (PIEAS), 45650, Islamabad, Pakistan
 - Participated workshop on “How to approach and manage funded research projects? Organized by Office of research innovation and commercialization (ORIC), at Centre for Undergraduate studies, University of the Punjab, Lahore (18th June, 2019)
- Member of advisory committee for workshop conducted on National Workshop on Recombinant DNA technology 8th – 13th April 2019, held at School of Biological Sciences, University of the Punjab, Lahore.

- Organizer and an instructor in National Workshop on Production and Purification of Recombinant proteins (12th – 17th November, 2018), School of Biological Sciences, University of the Punjab, Lahore.
- Member of advisory committee for workshop conducted on National Workshop on Recombinant DNA technology 2nd – 7th April 2018, held at School of Biological Sciences, University of the Punjab, Lahore.
- Organizer and an instructor in National Workshop on Recombinant Protein Production & Purification (6th – 11th November, 2017), School of Biological Sciences, University of the Punjab, Lahore.
- Workshop on “Patent Filing” arranged by ORIC, University of the Punjab, Lahore, 17th – 18th May, 2017.
- Member of advisory committee for workshop conducted on National Workshop on Recombinant DNA technology 3rd – 8th April 2017, held at School of Biological Sciences, University of the Punjab, Lahore.
- Member of advisory committee for workshop conducted on 2nd National Workshop on Recombinant DNA technology 25th – 30th April 2016, held at School of Biological Sciences, University of the Punjab, Lahore.
- Member of advisory and organizing committee for workshop conducted on First National Workshop on Recombinant DNA technology 22nd – 29th April, 2013, held at School of Biological Sciences, University of the Punjab, Lahore.
- **Invited speaker**

Sr. No.	Description
1	Guest speaker and as an Evaluator of Biotechnology model competition 2022 at Department of Biotechnology, Lahore College for Women University - 21 st April, 2022
2.	As a National invited speaker to give lecture on “ Rapid identification of microorganism by MALDI biotyping ”, on 16 th Annual conference of Medical Microbiology and Infectious diseases society of Pakistan (MMIDSP) at Sindh Institute of Urology and transplantation Karachi, Pakistan (22–23 February, 2019)
3.	As a Guest Mass Spectrometrists Speaker to give lecture on “ Bottom-up proteomics in the characterization of proteins: A journey from MS to MS MS ” at 2 nd National training workshop on Chromatography & Mass Spectrometry” held in National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad (28 th October – 1 st November, 2013).
4	As a Guest Mass Spectrometrists Speaker to give lecture on “ Characterization of proteins by MALDI-TOF and ESI; Challenges and prospects ” at 1 st National training workshop on Chromatography & Mass Spectrometry” held in National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad (April 02 – 06, 2012).

CONFERENCE/SEMINAR

- Oral presentation in **International Conference on Advances in Biological Sciences (ICABS 6th – 8th March, 2023)**, on “N-terminal processing of recombinant mammalian proteins in *Escherichia coli*” at SBS , PU. Abstract book pp 79 - 80.
- Participated 17th Annual conference of Medical Microbiology and Infectious diseases society of Pakistan (MMIDSP) at Pearl Continental Hotel, Lahore, Pakistan (28th Feb – 1st March , 2020)
- Oral presentation in **International Conference Punjab University ICPU, (6th – 8th November, 2019)**, on First Studies on the Rapid identification of Microorganisms by MALDI Biotyping in Pakistan. Pp. 73 – 74.
- **Participated in the following poster presentations in International Conference Punjab University ICPU, (6th – 8th November, 2019):**
 1. Optimization of *in vitro* fibril formation of insulin derivatives. Ajmal, S., **Gardner, Q.A.**, Williamson, P.T., Akhtar, M. pp170.
 2. Microbiome profiling of Gilgit Baltistan by MALDI biotyping. Bukhari, S.S., **Gardner, Q. A.**, Akhtar, M. pp 147.
 3. Synthesis and substrate specificity of acyl insulin derivatives for carboxypeptidase B **Ahmad, S., Gardner, Q. A.** and Akhtar, M. pp 156.
 4. Comparative studies on the characterization of full-length and truncated bubaline serum amyloid A-1 derivatives. Arshad, H., Yaqoob, C., Hassan, N., **Gardner, Q.A.**, Akhtar, M. pp136 -137.
 5. Effect of signal peptide on the expression and refolding of recombinant insulin precursors. Hassan, N., **Gardner, Q. A.**, Akhtar, M. pp 136 - 137
 6. Genetic engineering of human cytochrome b5-proinsulin chimera for the enhancement of proinsulin expression in *Escherichia coli*. Nasar, S., Hassan, N., **Gardner, Q. A.**, Akhtar, M. pp 146
 7. Production of insulin and proinsulin related antibodies and their cross-reactivity towards proinsulin derivatives. Munir, S., Hassan, N., **Gardner, Q. A.**, Akhtar, M. 143 -144.
 8. Mechanistic studies on *Pyrobaculum calidifontis* porphobilinogen synthase. Azim, N., **Gardner, Q. A.**, Rashid, N., Akhtar, M. pp 137.

9. N-terminal stabilisation of recombinant human interferon alpha has a role in its activity enhancement. Ahsan, F., **Gardner, Q. A.**, Rashid, N., Towers, G., Akhtar, M. pp 260
 10. Designing structural-motifs for the preparation of acylated proinsulin and their regiospecific conversion into insulin modified at Lys29 (K29). Ahmad. M., **Gardner, Q. A.**, Rashid, N. and Akhtar, M. pp 178 - 179
- **Presented SBS research activities in Meeting on state of Medical Research and NUMS Research agenda at Planning Commission, Ministry of Planning, Development and Reform, Pakistan Secretariat, Islamabad , on 3-5-18**
 - Participated CCPN 2015 Conference, University of Derby, Buxton, United Kingdom, 20-22 July 2015
 - Active participation in the Conference organized by The Pakistan Society of Nuclear Medicine, 2002 International Nuclear Medicine Conference Lahore (April 3-4, 2002).
 - Active participation and organization of 7th international conference of the Pakistan Society for Biochemistry and Molecular Biology "Trends in Biochemistry and Molecular Biology" held in Institute of Biochemistry and Biotechnology on April 2–5, 2003
 - Participation as an active member of Organizing Committee of 18th Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB) Symposium being held at Lahore on 20–23 November, 2005.

SYMPOSIA

- Contributed as an active member of organizing committee of an international symposium on "**Nanochemistry of Enzymes**" held in School of Biological Sciences, University of the Punjab, Lahore on September 20–21, 2006.
- Symposium on "**Biomarker Measurements in Complex Matrices**" organized by Pakistan Society for Biochemistry and Molecular Biology at School of Biological Sciences, University of the Punjab, Lahore on 25–26 April, 2007.
- Contributed as an active member of organizing committee of an international symposium on "**Role of Glycoproteins in Health and Diseases**" held in School of Biological Sciences on May 27–29, 2008.

- Contributed as an active member in symposium on "**Working with Proteins in Post-Genomic Era**" held in School of Biological Sciences on **January 06, 2010**.