CURRICULUM VITAE

(November, 2023)

NAME **M. Waheed Akhtar, Ph.D.**

CURRENT POSITIONS Professor Emeritus, School of Biological Sciences, University of the Punjab, Lahore

ADDRESS **Office:** School of Biological Sciences,
University of the Punjab, Lahore-54590, Pakistan.
Phones: +92 (0)300 410 5823; +92 (0)42 9923 0970
Email: mwa.sbs@pu.edu.pk

Home: 408A, Eden City, DHA-Phase VIII, Lahore, Pakistan.

MARITAL STATUS: Married, three children

PREVIOUS POSITIONS

Founding Director, Inst. of Biochemistry and Biotechnology, University of the Punjab, Lahore, 1996
One of the Founding Directors, School of Biological sciences, University of the Punjab, Lahore, 2002
Dean, Faculty of Science, University of the Punjab, since July 2002-April 2004
Meritorious Professor, July, 2002 - April, 2004
Visiting Professor, Biotechnology Center, Cornell University, USA. Dec. 1989 - Dec. 1990
Director, Planning and Development, University of the Punjab, Lahore, 1996 - 2000
Visiting Faculty, Aug. - Sept. 1988, Trinity College, Dublin, Ireland
Professor of Biochemistry, University of the Punjab, since Nov. 1984
Visiting Scientist, July-Sept. 1987, Cornell Univ., Ithaca, New York, USA.
Visiting Faculty, July-Oct. 1986, Trinity College, Dublin, Ireland
Visiting Faculty, July-October 1984, Trinity College, Dublin, Ireland.
Associate Professor, University of the Punjab, May 1982-Nov. 1984
Assistant Professor, University of the Punjab, June 1970- May 1982
Lecturer, University of the Punjab, Lahore, Jan. 1967 - Jun. 1970.

EDUCATION

Ph.D. Biochemistry, 1970-73, University of Strathclyde, Glasgow, Scotland.
M.Sc. Chemistry (Biochemistry) 1965-66, University of the Punjab, Lahore.
B.Sc. Hons. Chemistry, 1962-65, University of the Punjab, Lahore.
F.Sc. Pre-medical, 1960-62, Board of Intermediate and Secondary Education, Lahore.
Matriculation, Science, 1960, Board of Intermediate and Secondary Education, Lahore.
Certificate-outstanding contributions in workshop-Electronic Government through Information Technology, Feb., 1998, Islamabad.
Certificate of participation in Sixth FAOB/IUB Symposium held in Nov. 1987, at Karachi.
Diploma on Biochemical Research Methods, 1981, Biochemical Separation School, Uppsala, Sweden.
Teacher's Training Certificate, 1969, University of the Punjab, Lahore.

DISTINCTIONS, AWARDS AND FELLOWSHIPS

1. Professor Emeritus, University of the Punjab
2. Meritorious Professor, University of the Punjab, 2002 – 2004; in recognition of professional contributions and experience.
3. Fellow Pakistan Academy of Sciences, since 1998.
4. International Foundation for Science/King Báudouin Award, Sweden for research of exceptional merit (1993).
5. Tamgha-e-Imtiaz, Government of Pakistan, 1999.
6. Best teacher award, Higher Education Commission, Govt. of Pakistan (2003).
7. Consultant United Nations Industrial Development Organization (UNIDO), Aug. - Sept. 1988, Trinity College, Dublin, Ireland.
8. UNIDO Consultant, July-Oct. 1986, Trinity College, Dublin.
9. UNIDO Consultant, July-October 1984, Trinity College, Dublin.
10. Chairman, Organizing Committee, 18th Symposium of the Federation of Asian and Oceanian Biochemists and Molecular Biologists, at Lahore, Pakistan during Nov. 20-23, 2005.
11. Member Advisory Panel Royal Swedish Academy of Sciences for making nomination for the award of Nobel Prize in Chemistry, 1994 and 2000.
12. Member Executive Council, Pakistan Academy of Sciences, 2007-2010.
13. Secretary, Lahore Chapter, Pakistan Academy of Sciences, 2023-2026.
14. Elected Honorary Fellow, Pakistan Society for Biochemistry and Molecular biology, 1997.
15. British Council Award to study teaching and research in biochemistry and biotechnology in British universities and develop joint programs. Feb. 1994.
16. Senior Fulbright Research Fellowship, 1989-90.
17. Govt. of Pakistan Award for Ph.D. studies, University of Strathclyde, Scotland, U.K. 1970-1973.
18. First position in M.Sc. Biochemistry group, 1966

RESEARCH SUPERVISION

The researchers listed below successfully completed their research under his supervision for the Ph.D. degree.

Sr. No.	Name of the scholar	Topic of research	Award Year
1.	A. Q. Mirza	Effect of triglycerides on the nature and amount of lipase produced by certain fungal species	1983
2.	Naheed Kausar	Lipases of indigenous plant seeds	1985
3.	Nadeem N. Malik	Simultaneous production of biomass and extracellular enzymes from filamentous fungi grown on agricultural and industrial wastes	1987
4.	Faiz ur Rehman	Preparation of new radio pharmaceutical and their biochemical and pharmacokinetic studies	1987
5.	Abdul Hamid K. Niazi	Improvement in the nutrition value of mustard seed cake	1988
6.	Mrs.Tehseen Amanullah	Biosynthesis of molecular species of glycerolipids in plants during seed maturation and germination	1988
7.	Javed Anwar Qureshi	Physiological and biochemical studies on the N_2 fixing Klebsiela strain (NIAB-1) isolated from Kallar grass roots	1991

8.	M. Ibrahim Rajoka	Bioconversion of lignocellulosic materials raised from saline lands for production of biofuels using *Cellulomonas* species	1991
9.	Shaheena Zaka	Studies on composition and metabolism of lipids in seeds of Cassia species	1991
10.	Basit Ali Shah	Nutritional evaluation of pigeon peas and its cooking characteristics	1992
11.	A. J. Sami	Purification and cellulolytic enzymes by microorganisms	1993
12.	Farooq Latif	Bioconversion of lignocellulosic substrates by fungi	1993
13.	Aftab Ahmad	Biochemical and molecular analysis of the induction of p52(PAI-I) gene expression by transforming growth factor β (TGF-B) in cultured normal rat kidney fibroblasts	1996
14.	Naheed Afzal	Investigation into the nature of solid state fermentation of lignocellulose	1996
15.	Tariq Mahmood	Bacterial heap leaching studies of low-grade uranium ores from Siwalik sandstone ore deposits, Sulaiman range, Pakistan	1997
16.	Ejaz Ahmad	Studies on lipids of plant seeds belonging to genus *carum* of umbelliferae family	1998
17.	Mahjabeen Saleem	Characterisation & improved production of xylanolytic enzymes of thermophilic microorganisms	1999
18.	M. Saleem Akhtar	Bioconversion of cellulosic materials by the action of microbial cellulases	1999
19.	Mrs. Hamida Khalid	Purification and characterisation of dihydropteridine reductase and tetrahydrobiopterin metabolism in mammalian tissues	2001
20.	Asma Saeed	Comparative studies on the biosorption of heavy metals of immobilized microalgal cultures, suspended biomass and agro wastes	2005
21.	Asghar Sultan	Biochemical study of hormones receptors in diabetes mellitus	2005
22.	Rubina Tabassum	PCR based identification and genetic relatedness among strains of *Mycobacterium tuberculosis* in clinical samples	2005
23	Ms. Tahira Yasmin	Leaching of sandstone uranium ores by acidophilic heterotrophs	2007
24.	Ms. Kalsoom Akhtar	Removal and recovery of heavy metals from industrial effluents/ bacterial leachate by microbial biomass	2008
25.	Saima Sadaf	Characterisation of somatotropin of local bovine breeds and cloning and over-expression of its gene	2008
26.	Farkhanda Ghafoor	Development of assays for thyroid autoantibodies and clinical application during pregnancy	2009
27.	Shameem A. Siddiqui	Role of glucose and insulin resistance in the development of non-insulin dependent (type 2) diabetes mellitus	2009
28.	Najam-ul-Sahar Sadaf Zaidi	Cloning and over-expression of cellulase genes of thermophilic bacterial species	2009
29.	Shumaila Naz	High level expression of cellulase genes of alkalophilic *Bacillus* species	2009
30.	Nadia Ikram	Enhanced production of thermostable bacterial proteases and their application	2009
31.	Muhammmad Altaf Khan	Genetic analysis of caprine growth hormone and its recombinant production	2009
32.	Ruqayya Gul	Immunological relationships between growth hormones of the local breeds of the farm animals	2012
33.	Haroon Hussain	DNA typing for characterization of local farm animals	2012
34.	Saadia Shehzad	Effect of thiamine on hyperlipidemia and activities of thiamine-	2012

		dependent enzymes in diabetes mellitus type II patients	
35.	Salma Mazhar	Role of dietary practices in onset of type-II diabetes and its management amongst female population	2013
36.	Samreen Riaz	Effect of thiamine intake on the biochemical parameters in diabetes mellitus type II patients	2013
37.	Imran Mahmood Khan	Protein engineering of xylanolytic enzymes for improved properties	2014
38.	Tamseela Mumtaz	Identification of protein biomarkers in Hodgkins and non-Hodgkins lymphoma patients	2014
39.	Muhammad Sajjad	Molecular engineering of cellulose hydrolyzing enzymes of thermophilic bacteria	2014
40.	Sajjad Ahmad	Protein engineering of exocellulases for improved characteristics	2014
41.	Sana Khursheed	Protein antigens from *Mycobacterium tuberculosis*: recombinant expression and characterization	2015
42.	Faiza Gul	Expression and secretion of recombinant ovine somatotropin in *Escherichia coli*	2015
43.	Madiha Afzal	Recombinant production of native and multi-epitope fusion antigens of *Mycobacterium tuberculosis* and their evaluation	2016
44.	Shaista Bashir	Enhanced and solubilized expression of human granulocyte colony stimulating factor	2016
45.	Ruqayya Khalid	HSPX and PE/PPE antigens of Mycobacterium tuberculosis: recombinant production and immunogenic characterization	2016
46.	Saba Ghazanfar (Co)	Identification of differentially expressed proteins in colorectal cancer	2017
47.	Aasia Khaliq (Co)	Rapid detection of infection and drug resistance in tuberculosis patients	2018
48.	Muhammad Mudassir Iqbal (Co)	Molecular cloning, sequence characterization and expression studies of human interleukin-24	2018
49.	Razia Tajwar	Protein engineering and characterization of xylanases from *Thermotoga maritima*	2019
50.	Sahar Shahid	Effects of carbohydrate binding modules on characteristics of xylanases from thermophilic bacteria	2019
51.	Abdul Basit	Engineering endoglucanases from *Thermotoga* sp. To improve their characteristics	2019
52.	Jawaria Shaheen (Co)	Circulating micro RNAs as novel non-invasive biomarkers for breast cancer	2019
53.	Samiah Shahid (Co)	Plasma microRNA profiling in acute lymphoblastic leukemia	2020
54.	Shahzadi Naureen	Characterisation of differentially expressed proteins in ovarian cancer	2020
55.	Mohsina Akhter	Construction of fusion antigens of *Mycobacterium tuberculosis* for diagnostic and therapeutic applications	2021
56.	Shaista Arif	Immunological evaluation of Esx-1 substrate and PPE family fusion proteins of *Mycobacterium tuberculosis*	2021
57.	Sadaf Sulman	Assessment of T-cell Responses to Novel Fusion Proteins in *Mycobacterium tuberculosis*-Infected and Vaccinated Mice	2022
58	Haseeb Nisar (Co)	Association of genetic polymorphism in pro-inflammatory interleukins with rheumatoid arthritis in Pakistani population	2022
59.	Umbreen Tauseef	Proteomic Profiling and Identification of Novel Biomarkers in Infertile Polycystic Ovary Syndrome and Ovarian Cancer Women	2022

60.	Madiha Awan	Identification of Protein Markers in Oral Squamous Cell Carcinoma (OSCC)	2022
61.	Chandni Yaqoob	Construction and Immunological Characterization of Latent TB Specific Fusion Antigens of *Mycobacterium tuberculosis*	2023
62	Nasir Mahmood	Immunological Characterization of Fusions Constructed from Antigens of *Mycobacterium tuberculosis"*	2023
63.	Fatima Rahman	Construction of bifunctional enzymes for saccharification of plant biomass polysaccharides	2023
64	Mohsin Shad (Co)	Development of Highly Thermostable Alpha-Amylase through Protein Engineering for Industrial Applications	2024
65	Safa Akhtar	Study of differentially expressed proteins in renal cell carcinoma	2024
66	Naveed Hussain	Multifunctional cellulolytic enzymes; Engineering cellulases	Submitted

RESEARCHERS CURRENTLY WORKING IN THE RESEARCH GROUP OF M. WAHEED AKHTAR

Sr. No.	Name of Researcher	Status	Research Area
1.	Abdullah Ghaffar	Ph.D. researcher	Designing, production and diagnostic validation of fusion proteins from multistage antigens of *Mycobacterium tuberculosis*
2.	Kubrah Dastgir	Ph.D. researcher	Development of serodiagnosis based on early secretory antigens of *Mycobacterium tuberculosis*
3.	Ayesha Liaqat	Ph.D. researcher	Designing proteins and peptides for developing an effective vaccine for tuberculosis
4.	Amina Kainat	Ph.D. researcher	Designing, production and application of novel peptides for high affinity binding to hair keratin
5.	Sana Batool	Ph.D. researcher	Designing and production of novel serine proteases for application

List of completed M.Phil. Degree Research Supervised

No.	Name	Title of thesis	Award Year
1.	M.Shahzad Ali	Expression and characterization of endoglucanase celX from *Clostridium* sp.	2015
2.	Faiza Asghar	Effect of CBM2 on expression and activity of Cel5A of *Thermotoga maritima*"	2016
3.	Faiqa Komal	Effect of CBM-3 fusion at C-terminal on expression and activity of *Clostridium thermocellum* CelB	2016
4.	Iqra Jabbar	Effect of CBM3 on expression and activity of Cel5A of *Thermotoga maritima*	2016
5.	Saadia Israr	Cloning & expression of cel 12b of *Thermoliga neapolitana*	2016
6.	Tayyaba Rubab	Directed evolution of endoglucanase celA-CD of *Clostridium thermocellum*	2017

7.	Khadija Waqar	Effect of linker length and dockerin on the catalytic activity of endoglucanase E. from *Clostridium thermocellum*	2017
8.	Faiza Asghar (ii)	Solubilization of cel12B of *Thermotoga neapolitana* in fusion with SUMO	2017
9.	Farhana Ibrahim	Construction of fusion molecule from celA and BglA of *Clostridium thermocellum*	2017
10.	Saba Fatima	"Construction of fusion molecule from CelA and BglA of *Clostridium thermocellum*	2017
11.	Farah Deeba	Effect of CMB3 fusion at N-terminal on expression and activity of *Clostridium thermocellum* celB.	2017
12.	Aneeqa Iqbal	"Effect of CBM6 on the Activity of Xylanase XynA of *Thermotoga maritima*"	2017
13.	Anum Shafiq	"Effect of positioning of CBM3c on the activity of Cel9R of *Clostridium thermocellum"*	2017
14.	Abdullah Ghaffar	Construction of new fusion antigens for diagnosis of tuberculosis	2018
15.	Muhammad Zeeshan Younas	Recombinat Production and Purification of Nucleocapsid Protein of SARA-CoV-2	2020
16	Zara Ashi	Production and Purification of Highly Immunogenic Fragment from S2 Domain of SARS-CoV-2 Spike Protein	2022
17	Maira Nadeem Dar	Expression and purification of high sulfur keratin associated peptide	2023

Additionally, several dozen students did research in partial fulfillment of the requirements for their M. Sc. degrees over the years.

CURRENT RESEARCH INTERESTS

1. Genetic resistance markers for MDR-TB and designing and production of multi-epitope proteins for use in diagnosis and as a vaccine for TB.
2. Designing keratin associated peptides (KAPS) for hair treatment
3. Engineering proteins by rearranging the fragment sequences and error-prone PCR for enhancing activity and stability of cellulolytic and xylanolytic enzymes and their application in saccharification of plant biomass.
4. Characterization of protein markers for early diagnosis of some forms of cancer.

COLLABORATING INSTITUTIONS

Foreign Institutions

- Rosalind Franklin Institute, Harwell Campus, OX11 0QX/ Division of Structural Biology, Roosevelt Drive, OX3 7BN, University of Oxford, Oxford, England.
- Department of Infection, Immunity and Inflammation, University of Leicester, UK
- Center for Comparative Medicine, School of Medicine, University of California, Davis, USA

  (Collaborating currently under a project funded by Pak-US S&Tech. Program)
- Department of Molecular Genetics, Trinity College, Dublin, Ireland
- United Nations Industrial Development Organisation, Vienna, Austria
- Department of Molecular Biology and genetics, Cornell University, Ithaca, USA

- Warwick Medical School, University of Warwick, UK
- William Harvey Research Institute, Queen Mary's School of Medicine and Dentistry, University of London, UK
- Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, UK

National Institutions

- University of Health Sciences, Lahore
- PCSIR laboratories, Lahore
- Institute of Industrial Biotechnology, Govt. College University, Lahore
- Department of Biological Sciences, Forman Christian College University, Lahore
- National Institute of Biotechnology and Genetic Engineering, Faisalabad
- University of Veterinary and Animal Sciences, Lahore
- Department of Biochemistry, University of Karachi, Karachi
- And others

RESEARCH FUNDING BY NATIONAL AND INTERNATIONAL FUNDING AGENCIES

Several national and international funding agencies have funded research projects on competitive basis. A wide variety of research equipment and other facilities costing several hundred millions of Rupees was acquired. Research done under these projects have made substantial contribution in areas of national significance.

Sr. No.	Title of the Research Project	Duration	Amount	Position	Funding Agency
1.	Production and characterization of enzymes of commercial importance	1978 - 1981		Co-Principal Investigator	Pakistan Science Foundation, Islamabad
2.	Bioconversion of lignocellulosic substrates	1984 - 1987		Principal Investigator	Pakistan Atomic Energy Commission, Islamabad
3.	Study of cellulase genes of *C. flavigena*	1984, 1986 and 1988		Consultant Researcher	UNIDO, Vienna/Trinity College, Dublin
4.	Bioconversion of cellulosic materials by cellulolytic microorganisms	1985 - 1990		Principal Investigator	International Foundation for Science, Sweden
5.	Studies of cellulase gene of Bacillus CT1	July - Oct. 1987		Visiting Scientist	Cornell University, Ithaca, USA
6.	Expression and characterization of cellulase genes	Dec. 1989 - Dec. 1990		Visiting Professor	Fulbright Fellowship/ Cornell Univ. USA
7.	Characterisation and improvement of locally isolated cellulolytic organisms	1991 - 1994		Principal Investigator	NSRDB, Islamabad
8.	Characterisation and applications of newly isolated thermophiles and extreme thermophiles	1993 - 1995		Principal Investigator	ISESCO, Rabat, Morocco
9.	Development of a thermostable	1994 - 1997		Principal	Pakistan Science

	cellulase system for the bioconversion of lignocellulosic biomass			Investigator	Foundation, Islamabad
10.	Relationship between biochemical parameters and pathological state in cardiovascular disease	1997 - 1999		Principal Investigator	Punjab University
11.	Characterisation and applications of bioregulators of economic importance	2003 - 2007		Project Director	Higher Education Commission
12.	Development of immunoassays for glycated hemoglobin and bovine growth hormone	2004 - 2007		Link Coordinator	Higher Education Commission/ British Council
13.	Effect of high dose thiamine therapy on molecular aspects of thiamine-dependent enzymes in type 2 diabetic patients	2006 - 2009		Principal Investigator	Higher Education Commission of Pakistan
14.	Receptor binding studies of modified growth hormone	2007 - 2010		Link Coordinator	Higher Education Commission/ British Council
15.	Study of protein biomarkers for early detection of pathological states	2007 - 2011		Principal Investigator	Higher Education Commission
16.	Production of bioenergy from plant biomass (a collaborative project with major share of the School of Biological Scienes lab.)	2008 – 2010 and 2012-2014		Principal Investigator	Ministry of Science and technology
17.	Preparation and applications of growth hormone injectables (part of the project “Strengthening of School of Biological Sciences”)	2008 - 2014		Principal Investigator	Govt. of Pakistan
18.	Over-expression of therapeutic proteins in bacteria and yeast for applications	2010 - 2013		Principal Investigator	Pakistan Academy of Sciences
19.	Free circulating molecular markers in cancer diagnosis and prognosis amongst different population groups.	2011 - 2016		Principal Investigator	HEC, Pakistan
21.	Rapid detection of infection and drug resistance in tuberculosis patients by multiplex analysis	2010-2014		P.I. of the Punjab University component of the joint project with UCL, Davis, USA	Pakistan-US Science and Technology Cooperation Program 2009
22.	Validation of a microbead multiplex assay for rapid and reliable diagnosis of TB	2010-2011		P.I. of a joint project between The School of Biological Sciences, and UCL, Davis, USA	EMRO (WHO) Switzerland
23.	Engineering enzymes for plant biomass saccharification by directed evolution	2014-2018		Principal Investigator	HEC, Pakistan

24.	Development and commercialization of blood based tuberculosis diagnostic test	2015-2018		Co-Principal Investigator	Pakistan-US S&T Cooperation Program 2009
25.	Designing fusion antigens for diagnostic and prophylactic applications in tuberculosis	2018-2020		Principal Investigator	Pakistan Academy of Sciences
26.	Development of a reliable, economical and high throughput serodiagnostic method for early detection of COVID-19	2021-2022	RS. 14.76 mil.	Approval P.I. M. Waheed Akhtar Execution P.I. Dr. M. Sajjad	Higher Education Commission, Pakiatan
27.	Designing, production and validation of anabolic peptides	2020-2022	US $ 74,200	Principal Investigator	Turtle Tree, Singapore
26.*	Development of a reliable, cost-effective and high throughput serodiagnosis method for tuberculosis	2021-2023	Rs. 2.530 mil.	Principal Investigator	Pakistan Academy of Sciences
28.	Designing, production and validation of peptides for cosmetic applications	2022-2023	US $ 28,000	Principal Investigator	Avlon Industries, Illinoise, USA
29.	Production of an effective subunit vaccine for tuberculosis	2023-2025	Rs. 5.257 mil.	Principal Investigator	Pakistan Science Foundation (Under process)
30	Waseem Memorial Fund support for laboratory reserch	2024-onward	Rs. ~2.5 million	Principal Investigator	Waseem Memorial Fund
31	Validation of the multi-antigen based fusion molecules for serodiagnosis and as a vaccine for tuberculosis	2024	Rs. 2.45 million	Principal Investigator	Pakistan Academy of Sciences

*The projects shown in green above are either in progress or likely to be initiated in near future.

PC1s PREPARED, GOT APPROVED AND EXECUTED UNDER THE PAKISTAN GOVERNMENT PSDP PROGRAM

No.	Project	Period	Amount	Position	Funding Agency
1.	Strengthening of Labs. of Institutes of Biochemistry and Biotechnology, Chemistry, and others	2001 - 2003	Rs. 39.842 mil.	One of the Project Director	Govt. of Pakistan
2.	Establishment of Central Instrumentation Laboratory	2003 (one year)	Rs. 35.800 mil.	Project Director	Govt. of Pakistan
3.	Establishment of the Institute of Biochemistry and Biotechnology, University of the Punjab	1996 - 2001	Rs. 39.872 mil.	Project Director	Govt. of Pakistan
4.	Characterisation and applications of bioregulators of economic importance	2003 - 2007	Rs. 32.153 mil.	Project Director/ Principal Investigator	Higher Education Commission Pakistan

5.	Strengthening of School of Biological Sciences, University of the Punjab	2004 - 2006	Rs. 39.430 mil.	Project Director	Higher Education Commission, Pakistan
6.	Strengthning of universities and institutions of higher learning in new and emerging Technologies	2005 - 2008	Rs.61.16 mil. (total amount Rs. 153.448 mil.)	Project Director	Higher Education Commission, Pakistan
7.	Study of protein biomarkers for early detection of pathological states	2007 - 2010	Rs. 31.642 mil.	Principal Investigator	Higher Education Commission, Govt. of Pakistan
8.	Production of bioenergy from plant biomass (a collaborative project with major share of the School of Biological Sciences lab.)	2008–2010 2012-2014	Rs.129.52 mil. (total amount Rs. 260.329 mil.)	Principal Investigator	Ministry of Science and technology, Govt. of Pakistan
9.	Preparation and applications of growth hormone injectables (as part of the overall project "Strengthening of School of Biological Sciences")	2008 - 2013	Rs. ~50 mil. (total amount Rs.377.328 mil.)	Principal Investigator	Govt. of Pakistan

TEACHING

- Chairman of the national committees appointed by HEC for designing courses for B.Sc. Honours, M.Sc. and M. Phil. courses in biochemistry, molecular biology and biotechnology.
- Taught courses on protein chemistry and molecular biology to B.Sc. Honours and M.Sc. classes, and M. Phil. classes throughout the career.
- Recently taught courses are
  - Advances in protein structure-function and protein engineering to B. Sc. Honours, M. Sc. and M. Phil. classes at Institute of Biochemistry and Biotechnology, and Ph.D. students in the School of Biological Sciences University of the Punjab, Lahore.
  - current trends in biotechnology to M. Sc. Classes at Institute of Biochemistry and Biotechnology, and
  - Techniques for the study of protein structure to M. Phil students in F.C. College University, Lahore.

AFFILIATION TO LEARNED BODIES

1. Secretary General, Pakistan Society for Biochemistry and Molecular Biology, 1991 to date
2. Life member, Pakistan Society for Biochemistry and Molecular Biology
3. Associate Editor, Pakistan Journal for Biochemistry, 1974-1993
4. Editor, "Newsletter" Pakistan Society for Biochemistry and Molecular biology
5. Member, Executive Council, Federation of Asian and Oceanian Biochemists and Molecular Biologists, 1995 - to date
6. Member, Editorial Board, Science, Technology and Development, Pakistan Council for Science and Technology, Islamabad, 1997 to date
7. Member, American Society for Microbiology

8. Life Member, Pakistan Association for the Advancement of Science
9. Elected Member, New York Academy of Sciences, New York. 1994-1996
10. Member, senate, university of the Punjab, 1984 – to date
11. Member, Academic Council, University of the Punjab, 1984 – to date
12. Convenor, Board of Studies in Biochemistry and Biotechnology, University of the Punjab
13. Expert, Min. Science & Technology, for evaluation of newly established Universities
14. Member, expert panels University Grants Commission - curriculum revision in chemistry, botany, zoology
15. Member, Government of Pakistan Steering Committee for the promotion of life sciences in the Country
16. Member, expert panel of the Pakistan Science Foundation, for reviewing research grant applications
19. Member, Chemical Society of Pakistan
20. Member, Advanced Studies and Research Board, Univ. of the Punjab, Lahore, 1995-98
21. Member, Board of Study Biological Sciences, Quaid e Azam University, Islamabad, 1994-97
22. Member, Board of Studies, Institute of Biochemistry, University of Baluchistan, Quetta
23. Chairman, Punjab University Research Committee, Univ. of the Punjab, 1996 to date
24. Chairman, Affiliation Committee, University of the Punjab, Lahore, 1998-2000
25. Member, Selection Board, HEJ Research Institute of Chemistry, University of Karachi, Karachi
26. Coordinator, PU-PARC Joint Committee for Life Sciences Research Center, Punjab University
27. Chairman, Committee for Hons. Degree Programs, University of the Punjab
28. Chairman, Punjab University Academic and Co-Curricular Committee
29. Member, University Campus Committee, University of the Punjab
30. Member, Campus Management Committee, University of the Punjab

PROFESSIONAL CONTRIBUTIONS

1. **Establishment of Institute of Biochemistry and Biotechnology (IBB), University of the Punjab**

The following were achieved in this connection.

i. Approval of this project by the Government for making available the funds
ii. Implementation activities for the establishment of the IBB were started in 1996
iii. Appointment as founding Director of the IBB in 1996
iv. Got a modern purpose-oriented building of the IBB designed to facilitate creation of healthy learning environment. The Institute moved into this new building in March, 2001
v. Academic programs of the IBB were initiated by admitting the first batch of students to the M.Sc. Biochemistry/Biotechnology degree programs in the session 1997-98.
vi. B. Sc. Hons. Biochemistry degree program was initiated in the session 2000-2001
vii. Designed the curricula for the M.Sc. and B. Sc. Hons. degree programs in order to impart updated knowledge in these rapidly advancing fields
viii. Implemented modern trends of teaching practices to ensure effective student learning.

2. **Arranging Memoranda of Understanding** between the University of the Punjab and

i. Cornell University, USA
ii. National Center of Genetic Engineering and Biotechnology, Tehran, Iran.

iii. Clinical Sciences Research Institute, University of Warwick, Coventry, U.K

iv. School of Medicine, University of California, Davis, USA

v. Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, UK

Coordinator/Link partner for all of these MOUs on behalf of the University of the Punjab.

3. **Promotion of biochemistry, molecular biology and biotechnology** in the country and abroad in the following capacities.

   a. As member and General Secretary of the Pakistan Society for Biochemistry and Molecular Biology (PSBMB) coordinated scientific activities in the fields of biochemistry and molecular biology over the years in the country.

   b. As member of the Executive Council of the Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB), and International Union of Biochemistry and Molecular Biology (IUBMB) made active contribution in the promotion of biochemistry and molecular biology in the Asian and Oceanian region, and projected the image of the country in the field of science.

4. **As member Advanced Studies and Research Board, University of the Punjab**

   a. Wrote the formats for writing synopsis and thesis for Ph.D. degree,

   b. Contributed in streamlining the procedures for evaluation of Ph.D. thesis, and in enhancing the standard of research in the University.

5. **As Director P&D, University of the Punjab**

   a. Wrote developmental schemes for the University for approval and funding by the Government,

   b. Contributed in planning and implementation of the academic programs in the University, and developing linkages within the country and the foreign universities.

6. **As Chairman, Punjab University Research Committee** contributed in

   a. laying down procedures for award of research grants on competitive basis and

   c. monitoring and evaluating the faculty research

7. Member Pakistan Program 2010 (Science and Technology) and Pakistan Program 2010 (Higher Education) – active participation for the promotion of education and science, May - June, 1997.

8. As member Expert Group of the Ministry of Science and Technology on "Strategies for the Development and Application of Biotechnology for Economic Growth" participated and contributed in determining the future plans.

9. Member, Government of Pakistan Steering Committee for the promotion of Life Sciences in the country.

10. Referee in the selection of applicants for the academic positions in the various universities of the country.

11. Referee for screening of applicants for the award of Fulbright Fellowship, administrated by the United States Educational Foundation.

12. Attended and participated in a large number of scientific conferences, symposia, seminars held in North America, Europe, East Asia, Australia and within the country over the years.

13. Delivered a large number of plenary, invited and other talks in national and international scientific meetings.

14. Gave seminars and lectures on current scientific issues in different universities and other educational institutions and also on the recent developments in life sciences and their impact on our lives and national economies to groups of governmental policy makers and other audience.

CONFERENCES, SYMPOSIA, SEMINARS ORGANISED

- Convenor, Organizing Committee, PSB Symposium "Biochemistry - Present and Future needs" held at Lahore 8 April, 1988
- Chairman, Organizing Committee, PSB-IUBMB International Workshop "Teaching and Research Trends in Biochemical Sciences, held at Lahore, 4-8 April, 1993

- Chairman, Organizing Committee, 3rd National Conference of the PSBMB held at Lahore 3-6 April, 1995
- Coordination in organizing the 4th National Conference of the PSBMB held at Peshawar, 7-10 April, 1997
- Coordination in organizing the 5th National Conference of the PSBMB held at Quetta in May, 1999
- Host Chairman Organizing Committee, 9th FAOBMB Congress, Lahore, Pakistan, Nov., 2001. (Could not be held due to 9/11 events).
- Coordination in organizing the 6th National Conference of the PSBMB held at Khairpur in Feb., 2001
- Chairman, Organizing Committee, 7th PSBMB International Conference, held at Inst. of Biochemistry and Biotechnology, Univ. of the Punjab, April 2-5, 2003
- Chairman, Organizing Committee of workshop on Problem Based Learning. 19 November, 2005. Lahore. Pakistan.
- Chairman, Organizing Committee of international Symposium on Biomarkers measurements in complex Matrices at School of Biological Sciences, Univ. of the Punjab, Lahore, 25-26 April, 2007.
- Organizer, Committee member of 8th PSBMB International Conference on Advance in Biochemistry and Molecular Biology. University of Karachi, Karachi, Pakistan. 4-8 March, 2008.
- Chairman, Organizing Committee of workshop on Problem Based Learning. 19 November, 2005. Lahore. Pakistan.
- Chairman, Organizing Committee of National level Symposium on Biomarkers measurements in complex Matrices at School of Biological Sciences, Univ. of the Punjab, Lahore, 25-26 April, 2007.
- Organizer, Committee member of 9th PSBMB International Conference on Advance in Biochemistry and Molecular Biology. Arid agriculture University Rawalpindi, Pakistan. 17-20 December, 2008.
- Chairman, Organizing Committee, international workshop "Separation Science and the Omics". School of Biological Science, Univ. of the Punjab, 6-10 April, 2009.
- Organizer, workshop "Enhanced Production of Recombinant Biomolecules of Commercial Importance" University of the Karachi, Karachi. 6-10 July, 2009
- Organizer, international symposium "Working with Proteins in Post-genomic Era" School of Biological Sciences, University of the Punjab, 6-7 January, 2010.
- Organized a workshop on "Computational Resources for Protein Modeling" held at the Institute of Biochemistry and Biotechnology, University of the Punjab, during 14-16 March, 2011.
- Chairman, Organizing Committee, symposium on "Tuberculosis- Epidemiology, Diagnosis and Therapeutics" held at the Institute of Biochemistry and Biotechnology, University of the Punjab, on 3 November, 2011.
- Chairman, Organizing Committee, 11th International Conference of PSBMB, held at University of the Punjab, Lahore, during Nov. 25-28, 2013.
- Awarded IUBMB grant for organizing an international symposium on Production of biofuels from plant biomass at Lahore, Pakistan.

PARTICIPATION IN INTERNATIONAL CONFERENCES/SYMPOSIA

- Participated and presented a paper, 7th FAOBMB Congress, Sydney, Australia, 24-29 September, 1995.
- Participated and presented an invited talk at 25th FAOBMB Anniversary Symposium, Manila, Philippines, 2-5 December, 1997.
- Participated and presented a paper, 8th FAOBMB Congress, Kuala Lumpur, Malaysia, 22-27 November, 1998.
- Participated and presented an invited talk at 14th FAOBMB Symposium, Dunedin, New Zealand November 28-December 3, 1999.
- Participated and attended FAOBMB Council meeting, 15th FAOBMB Symposium, Beijing, China, October 21 – 24, 2000.

- Participated and attended FAOBMB Council meeting, 16th FAOBMB Symposium, Taipei, Taiwan, September 20- 24, 2002.
- Visited collaborating laboratories at Cornell University, and University of California, Davis, USA, presented work done and planned future programs, 19 Sept. – 3 Oct., 2006.
- Visited collaborating laboratory at Cornell University, and University of California, Davis, USA, presented work done and planned future programs, 19 Sept. – 3 Oct., 2006.
- Visited collaborating laboratory at Cornell University, USA, presented work done and planned future programs, 19 Jan. – 8 Feb., 2004.
- Visited collaborating laboratory at Queens University, London, UK, presented work done and planned future programs, 23 Oct. – 1 Nov., 2004.
- Participated and presented a paper in the 30th FEBS Congress, Budapest, Hungary, July 2-7, 2005.
- Visited collaborating laboratory at Queens University, London and University of Strathclyde, Glasgow, UK, presented work done and planned future programs, 17 – 26 April, 2006.
- Participated and attended FAOBMB and IUBMB Council Meetings, 20th IUBMB/11th FAOBMB Congress, Kyoto, Japan, June 18 – 23, 2006.
- Visited collaborating laboratories at Cornell University, and University of California, Davis, USA, presented work done and planned future programs, 19 Sept. – 3 Oct., 2006.
- Visited collaborating laboratory at Queens University, London and University of Strathclyde, Glasgow, UK, presented work done and planned future programs, 27 March – 14 April, 2007.
- Visited collaborating laboratory at Queens University, London and University of Strathclyde, Glasgow, UK, presented work done and planned future programs, 14-25 July, 2007.
- Participated and presented a paper in FABA Conference, Hyderabad, India, 7–10 February, 2008.
- Partipated and presented a paper in the 33rd FEBS Congress/11th IUBMB Conference, Athens, Greece, June 28 – July 3, 2008.
- Participated and presented a paper in the Gordon Conference, Andover, USA, July 26 – 30, 2009.
- Participated and attended Council meetings of FAOBMB and IUBMB, 20th IUBMB/11th FAOBMB Congress, Shanghai, China, 2-7 August, 2009.
- Visited collaborating laboratory at Queens University, London and University of Strathclyde, Glasgow, UK, presented work done and planned future programs, 15- 23 January, 2010.
- Participated and presentred paper at 14th International Biotechnology Symposium and Exhibition, Rimini, Italy. 14-18 September, 2010.
- Participated and presented a talk on "Validating multiplex assay for TB diagnosis" in the symposium held under the Pak-US S&T cooperation, during 21-24 March, 2011, at Dubai, UAE.
- Participated as an expert for reviewing and approval of research proposals submitted for funding by EMRO, Mediterrean Region, during 23 – 27 July, 2011 at Cairo, Egypt.
- Delivered an invited talk on "Role of binding domains in the activity of glycoside hydrolases" on 5 Oct, 2011, at Institute for Basic Research in Developmental Disabilities, Staten Island, New York, USA.
- Visited the collaborating research labs in Cornell University and University California, Davis, and gave a talk on the recent developments in research on Mtb DNA isolates and their proteins in our laboratory at UC Davis, on 10 October, 2011.
- Participated and gave an invited talk on "Role of carbohydrate binding modules on the activity of cellulases and xylanases" in the BIT's Symposium "Enzymes and Biocatalysis" Xian, China, during 25-28 April, 2012.

- Visited the collaborating laboratory at University California, Davis, USA to make a presentation and discuss recent developments and future programs of our collaborative project on developing a multiplex microbead based assay for rapid diagnosis of tuberculosis, 7-16 July, 2012.
- Invited talk Binding Modules of Glycoside Hydrolases. 13th FAOBMB Congress, Bangkok, Thailand, 25-29 Nov, 2012.
- Participated in the conference Biomarkers of Tuberculosis held at Washington, USA during 5-7 September, 2013.
- Visited University California, Davis, USA, to make a presentation and discuss recent developments and future programs of our collaborative TB project, 8-19 September, 2013.
- Participated as a keynote invited speaker in the First International and 13th Iranian Genetics Congress, May 24-26, Shahid beheshti University of Medical Science, Tehran, Iran.
- Invited speaker in the conference on Protein Engineering held on 25-27 Oct., 2015 at Chicago, USA.
- Invited talk in BIT's 9th PepCon held on 25-27 April, 2016 at Dalian, China.
- Invited talk in 25th FAOBMB conference held during 5-7 Dec, 2016 at Manila, Philippine.
- Invited talk Fifth ICLS-KIBGE Conference on Responsible Conduct of Science: Ethical concerns in Medical and Pharmaceutical Practice and Research, held on May 20-22, 2017 at Karachi University, Karachi, Pakistan.
- Plenary talk "Fusion Antigens for Improving Sensitivity in Serodiagnosis of Tuberculosis" 6th MMDR Conference, Nov. 6-9, 2017, ICCBS, University of Karachi, Karachi.

Co-curricular activities

1. President, Fulbright Alumni Association, Lahore Chapter, 1994-1998
2. Chairman, Punjab University Academic and Co-Curricular Committee
3. President, Society for the Promotion of Public Awareness (a voluntary welfare organization), 1995-96
4. President, Punjab University Teaching Departments Sports Association, 1983-85
5. Hon. Assistant Treasurer, Student Union, University of Strathclyde, Glasgow, Scotland, 1971-72
6. University Blue, University of Strathclyde, Glasgow, Scotland, outstanding performance in Sports, 1972
7. Captain, Cricket Team, University of Strathclyde, Glasgow, Scotland, 1970-71, 71-72
8. Member, Students Representative Council, University of Strathclyde, 1970-71
9. Captain, Punjab University Faculties Cricket Team, 1965-66
10. Vice-President, Punjab University Students Union, 1964-65

PATENT/ RESEARCH PAPERS/TALKS

Patents

1. Patent awarded for "A recombinant nucleic acid encoding a protein exhibiting enhanced activity for milk production" Pakistan Patent No. 139216; Dated 18 Feb., 2007
   Patent awarded in favor of: School of Biological Sciences, University of the Punjab, Lahore
   Authors: M. Waheed Akhtar, Saima Sadaf, Muhmmad Altaf Khan

2. Patent awarded for "Multi-epitope fusion antigens for the diagnosis of tuberculosis"
   Pakistan Patent No. 142466; Dated 15 September, 2017
   Patent awarded in favour of: School of Biological Sciences, University of the Punjab, Lahore.
   Authors: M. Waheed Akhtar, Madeeha Afzal, Sana Khurshid, Ruqyya Khalid.

3. Patent awarded for "A polynucleotide comprising a nucleotide sequence encoding a fusion protein"
   Pakistan Patent No. 142886; Date: 8 May, 2019
   Patent awarded in favor of: School of Biological Sciences, University of the Punjab, Lahore
   Authors: M. Waheed Akhtar, Ruqyya Khalid, Madeeha Afzal and Sana Khurshid

4. Patent awarded for "A non-naturally occurring enzyme comprising a nucleic acid sequence homologous with endoglucanase of Clostridium Specie"
   Pakistan Patent No. 142893; Dated 8 May, 2019
   Patent awarded in favor of: School of Biological Sciences, University of the Punjab, Lahore
   Authors: M. Waheed Akhtar, Saima Sadaf, Shahzad Ali

5. Patent awarded for "Truncation and CBM engineering of CelZ.C of *Thermotoga Sp.* for improved biomass degradation"
   Pakistan Patent No. 143046; date October 24, 2019
   Applicant: School of Biological Sciences, University of the Punjab, Lahore
   Authors: M. Waheed Akhtar, Saima Sadaf, Abdul Basit

6. Patent awarded for "Novel Fusion protein NSFU1 with enhanced sensitivity for serodiagnostic tests of COVID-19"
   Pakistan Patent Application No. 438/2024; Dated 14 June, 2024
   Applicant: School of Biological Sciences, University of the Punjab, Lahore
   Authors: Shaista Arif, Mohsina Akhtar, Mohsin Shad, Sania Javed, Muhammad Sajjad and M. Waheed Akhtar.

Research Publications

1. Akhtar, M. Waheed, J. D. E. Patterson and J. A. Blain (1974) Influence of olive oil on extracellular and cell-bound lipase production by fungi. Pak. J. Biochem. 7, 81.
2. Akhtar, M. Waheed and M. I. D. Chughtai (1974) Micronutrients in our diet. Proceed. Pak. Acad. Sci., p. 83.
3. Akhtar, M. Waheed, Hamida Parveen, Shaheen Kausar and M. I. D. Chughtai (1975) Lipase activity in plant seeds, Pak. J. Biochem. 8, 77.
4. Akhtar, M. Waheed, J. A. Blain and J. D. E. Patterson (1975) Studies on Lipase specificity using an organic solvent system, Pa k. J. Sci. Res. 27, 212.
5. Blain, J. A., J. D. E. Patterson, C. E. Shaw and M. Waheed Akhtar (1976) Study of bound phospholipase activity of fungal mycelia using an organic solvent system. Lipids 11, 533.
6. Akhtar, M. Waheed, A. Q. Mirza and M. Saleem (1976) Influence of the nature of triglycerides on the amount and nature of lipase produced by fungi, Pak. J. Biochem. 9, 1.
7. Blain, J. A., M. Waheed Akhtar and J. D. E. Patterson (1976) Study on Lipase activities using organic solvent systems. Pak. J. Biochem. 10, 41.
8. Akhtar, M. Waheed, A. Q. Mirza, M. I. D. Chughtai (1977) Influence of the nature of triglycerides on the amount and nature of lipase production by *Rhizopus* species. Pak. J. Biochem. 10, 82.
9. Akhtar, M. Waheed and Nahid Kausar (1978) Isolation and characterisation of lipase of *Cucumis melo,* Pak. J. Biochem. 11, 6.
10. Khan, Rehana, S., M. Waheed Akhtar, and M. I. D. Chughtai (1977) Effect of carbon sources on protease production by *Mucor* species. Pak. J. Biochem. 12, 36.
11. Mirza, A. Q., M. Waheed Akhtar, M. I. D. Chughtai (1979) Effect of different triglycerides on lipase production by various *Mucor* species. Pak.J. Biochem. 12, 10.
12. Akhtar, M. Waheed, Lipase Induction in Fungi (1979) Pak.J. Biochem. M.I.D. Chughtai Commemorative Volume, p.115.
13. Khan, Rehana, S., M. Waheed Akhtar and M. I. D. Chughtai (1979) Effect of nitrogen sources on the growth and protease production by *Mucor* species. Pak. J. Biochem. 12, 68.
14. Akhtar, M. Waheed and Naheed Kausar (1979) Isolation and characterisation of lipolytic activity of *Hibiscus cannabinus* seeds. Pak. J. Biochem. 12, 46.
15. Akhtar, M. Waheed, A. Q. Mirza and M. I. D. Chughtai (1980) Lipase induction in *Mucor hiemalis.* Appl. Environ. Microbiol. 40, 257-263.

16. R Kader, A Yousuf, MM Hoq, MW Akhtar, AQ Miraz, MDI Chughtai (1980) Regioselective enzyme catalyzed synthesis of phospholipids esters, amides and multifunctional monomers. Journal of Applied Sciences 7 (6), 257-263

17. Akhtar, M. Waheed, Zafar Iqbal and M. N. Nawazish (1980) Lipid class and fatty acid composition of Pumpkin seeds. Pak. J. Sci. Res. 32, 295-300.

18. Akhtar, M. Waheed, et. al. (1980) Variations in lipid class and fatty acid composition of sunflower at various stages after blooming. Pak. J. Biochem. 13, 10.

19. Akhtar, M. Waheed, Mahmood Pasha, M. Nadeem Nawazish (1980) A Comparative study of lipase and phospholipase activities of *Mucor hiemalis* mycelial lipase using organic solvent system. Pak. J. Biochem. 13, 56.

20. Akhtar, M. Waheed, Naheed Kausar and M. N. Nawazish (1981) Phosphatide acylhydrolase and triglyceride acyl hydrolase activities in the primary roots of *Cucumis melo* seeds. Pak. J. Sci. Res. 33, 102.

21. Faiz ur Rehman, G. Subramaniam and M. Waheed Akhtar (1981) TC99m-Pyridoxal mimosine complex - preparation and biological evaluation for kidney scanning. Pak. J. Biochem. 14 , 15.

22. Akhtar, M. Waheed, M. N. Nawazish and Naheed Kausar (1981) Variation in the composition of polar and non-polar lipids and their fatty acids in the germinating seeds of *Cucumis melo*. Pak. J. Biochem. 14, 71.

23. Faizur-Rahman, M., Akhtar, W., Shahid, M. (1982) Technitium-99m-Sn-monomercapto-succinic acid (MMSA): A potential radiopharmacetical for renal studies. J. Nuclear Medicine 23 (5), 72.

24. Mirza, A. Q., Akhtar, M. Waheed, M. N. Nawazish and M. I. D. Chughtai (1982) Production of lipids and lipase activity during the growth of *M. hiemalis*. Can. J. Microbiol. 27, 618.

25. Akhtar, M. Waheed, M. N. Nawazish and Naheed Kausar (1982) Lipids mobilisation during germination of *Cucumis melo* seeds. Pak. J. Biochem. 15, 77.

26. Akhtar, M. Waheed, Faiz ur Rehman, Z. Haider and M. Shahid (1982) Production and biological evaluation of Tc 99m-Sn-thioglycolic acid-DI-isoleucine complex for myocardium imaging. Pak. J. Sci. Res. 34, 118.

27. Akhtar, M. Waheed, Faiz ur Rehman, M. A. Shahid and A. Ahmad (1982) Preparation and biological evaluation of Tc^{99m}SN phosphate colloid for study of reticuloendothelial system. Pak. J. Biochem. 15, 28.

28. Akhtar, M. Waheed, A. Q. Mirza, M. N. Nawazish and M. I. D. Chughtai (1983) Effect of triglycerides on the production of lipids and lipase activity by *Mucor hiemalis*. Can. J. Microbiol. 28, 664.

29. Sami, A. J., M. N. Malik and M. Waheed Akhtar (1983) Purification and partial characterisation of the extracellular lipases of *Mucor hiemalis*. Pak. J. Biochem. 16, 31-36.

30. Akhtar, Mahfooz, Faiz ur Rehman, M. A. Afaq Ahmad Qureshi, and M. Waheed Akhtar (1984) Tc^{99m}-Sn-MMSA perfusion study in various renal diseases. J. Pak. Med. Assocn. 17, 6-14.

31. Faiz ur Rehman, Malik, M. N., Akhtar, M. W. (1983). Preparation and *in vivo* distribution of Tc99m-Sn-thioglycolide-l-lysine complex. Pak. J. Biochem. 16, 25-29.

32. Malik, N. N., Naz, B. A., Sami, A. J. and Akhtar, M. W. (1984) Cellulase production by locally isolated *Trichoderma* species. Pak. J. Biochem. 17, 57-68.

33. M Akhtar, F Rehman, AA Qureshi, MW Akhtar (1984) Tc99m-Sn-MMSA perfusion study in various renal diseases. Pak. J. Biochemistry 17, 6-14

34. Malik, N. N., Naz, B. A., Sami, A. J., and Akhtar, M. W. (1985) Purification and characterization of crystalline cellulose hydrolysing enzyme of *T. harzianum*. Pak. J. Biochem. 18, 39-47.

35. Malik, N. N., Naz, B. A., Sami, A. J. and Akhtar, M. W. (1985) Some characteristics of the cellulases of *T. harzianum*, Pak. J. Sci. Res. 37, 17.

36. Aman, T., Khan, S. A., and M. Waheed Akhtar (1985) Lipid class and percentage in cotyledons and primary roots of Zea mays (Neelum), Pak. J. Biochem. 18, 9-18.

37. Faiz ur Rehman, Shamas-us-Zaman, Shahid, M. A., Imran, S. L., Ashraf, M. and Akhtar, M. W. (1986) Preparation of Tc99m-tin-Phosphate polyvinyl pyrrolidone stabilised colloid and distribution in bone marrow. Int J Rad Appl Instrum Part A Appl. Radiat Isot. 37, 249-255.

38. Faiz ur Rehman, Shamas uz Zaman, Shahid, M. A., Akhtar, M. W., Ashraf, M. and Haider, K. H. (1986) Preparation of Tc99m-TGA- ILEU complex and its comparison with TI ^{201}-chloride for myocardial imaging. J. Pak. Med. Assocn. 36, 40-43.

39. Zaka, S., Akhtar, M. W., Khan, S. A. and Bhatty, M. K. (1986) Characterization of the cassia seed oil by oxidative degradation. Proc. Pak. Acad. Sci. 23, 167-172.

40. Malik, N. N., Naz, B. A., Sami, A. J., and Akhtar, M. W. (1985) Cellulase induction in *T. harzianum,* Pak. J. Sci. Res. 37, 1.

41. Naz, B. A., Akhtar, M. W., Malik, N. N. and Sami, A. J. (1986) Production of cellulases by a newly isolated thermophilic *Bacillus*. Pak. J. Biochem. 19,19.

42. Zaka, Shahina, Akhtar, M. W. and Ahmad, Shafique (1987) Changes in carotenoids and tocopherols during maturation of cassia seeds. Pak. J. Sci. Ind. Res. 30, 812.

43. Akhtar, M. W., Duffy, M., Dowds, B., Sheehan, M. and McConnell, D.J. (1988) Multigene families of *C. flavigena* encoding β-1,4-endoglucanase (CM-cellulase), Gene, 74 , 549.

44. Sami,A.J., Akhtar, M. W., Naz,B.A. and Malik, N.N. (1988) Production of free and cellulose-bound cellulases of *C. flavigena.* Enzyme M icrob. Technol. 10, 626.

45. Zaka, S., Akhtar, M. W. and Khan, S. A. (1988) Effect of maturity on lipid classes and fatty acid composition of Cassia seeds. Pak. J. Sci. Ind. Res. 31, 106.

46. Niazi, A. H. K., Akhtar, M. W., and Shah, F. H. (1988) Detoxification of mustard seed cake-Elimination of toxic and antinutritive factors from mustard seed cake, Pak. J. Sci. Ind. Res. 31, 131-134.

47. Zaka, S., Khan, S. A. and Akhtar, M.W. (1988) Determination of triglyceride structure of Cassia species. Proceed. Pak. Acad. Sci. 25, 91.

48. Akhtar, M. W. and Sami, A. J., (1988), Separation and partial characterisation of two of the endoglucanases of *C. flavigena.* Pak. J. Biochem. 21, 9.

49. Akhtar, M. W. and Wilson, D. B. (1988) Cloning and expression of multiple endoglucanase genes of thermophilic *Bacillus*. Pak. J. Biochem. 21, 43.

50. MI Rajoka, A Bashir, MW Akhtar, M Duffy, BCA Dowds, MC Sheehan,Use of Congo red-polysaccharide interactions in enumeration and characterization of cellulolytic bacteria from the bovine rumen. Pakistan Journal of Biological Sciences 1 (3), 549-553

51. Sami, A. J. and Akhtar, M. W. (1989) Multiplicity of endo-1,4-B-D-glucanase activity in *C. flavigena*. Biochem. Soc. Transc. (London) 17, 580.

52. Sami, A. J. and Akhtar, M. W. (1989) Purification and characterisation of two native extracellular CMCases of *C. flavigena*. Biochem. Soc. Transc. (London) 18, 649.

53. Sami, A. J, and Akhtar, M. W. (1989) Purification and characterisation of three extracellular CMCases of *C. flavigena*, Biochem. Soc. Transc. (London) 18, 651.

54. Zaka, Shaheena, Akhtar, M. W., Khan A. Shafiq (1989) Phosphatide acyl-hydrolase and triglyceride acyl-hydrolase activities in the developing seeds of Cassia species, Pak. J. Sci. Ind. Res., 32, 27.

55. Zaka, Shaheena, Akhtar, M. W. and Khan A. Shafiq (1989) Lipid metabolism in germination seeds of Cassia, Pak. J. Sci. Ind. Res. 32, 323.

56. Khan, Rehana, S., Chughtai, M. I. D. and Akhtar, M. W., (1990) Some properties of the extracellular, cell bound and intracellular protease of *M. heimalis,* Pak. J. Biochem. 23, 69-75.

57. T Aman, SA Khan, W Akhtar (1990) Fatty acid composition of individual lipid fractions in cotyledons and primary roots of Zea mays (Neelum).Pakistan Journal of Scientific and Industrial Research

58. Aman, T., and Akhtar, M. W. (1991) Isolation and characterisation of Zea mays (Neelum) phospholipase. Sci. Int. (Lahore) 3(1), 61-64.

59. Ahmad, I., Rai, M. Y. and Akhtar, M. W. (1992) Distribution of fatty acids in the triglycerides of *Carum capticum*. Proceed. Pak. Acad. Sci. 29, 203-211.

60. Sami, A. J. and Akhtar, M. W. (1993) Purification and characterisation of two low molecular weight endoglucanases of *C. flavigena*, Enzyme Microb. Technol., 15 (7), 586-592.

61. Ahmad, Ijaz, Raie, M. Y. and Akhtar, M. W. (1993) Studies of lipase and phospholipase procured from the meal of *Carum capticum. P*ak. J. Sci. Ind. Res. 36(6-7), 248-251.

62. F Tabassum, R Khurshid, MW Akhtar, T Vehida, M Mukaiya, M Nishi (1993) Fundamentals of Clinical Chemistry, Determination of *Alkaline phosphatase* and Alanine Transaminase. Pakistan Journal of Biological Sciences 3 (9), 425-439

63. Akhtar, M. Waheed (1994) Teaching and research trends in biochemical sciences, Biochemical Education, 22(3), 131-134.

64. Ahmad, I., Raie, M.Y. and Akhtar, M.W., (1994) Studies on germinating *Carum capticum* seed lipids. Pak. J. Sci. Ind. Res., 37(5), 194-197.

65. Ahmad, Aftab and Akhtar, M. W. (1995) Effect of TGF-ß1 on the induction of glycoprotein p52 and cytomorphology of rat kidney fibroblasts. Pak. J. Biochem. Mol. Biol. 28, 129.

66. Akhtar, M. Saleem, Mahjabeen Saleem and M. Waheed Akhtar (1996) Purification and characterisation of three endoglucanases of *Bacillus subtilis*, Pak. J. Biochem. Mol. Biol. 29, 22-33.

67. Nabila Roohi, M. Waheed Akhtar and A.M. Cheema (1996) Electrophoretically resolved protein patterns of hypergonadotropins and hyperprolactin states in men. Acta Sci., 6: 127-138.

68. Saleem, Mah Jabeen, M. Saleem Akhtar and M. Waheed Akhtar (1997) Purification and characterization of a thermostable xylanase from a locally isolated *Bacillus subtilis*, Pak. J. Biochem. Mol.Biol. 30, 55-67.

69. S. M. Aslam Rizvi, M. Saleem Akhtar, Mahjabeen Saleem and M. W. Akhtar (1997) Regulation, purification and characterization of thermostable and potentially useful alkaline xylanases of thermophilic *Bacillus* Sp. XT2, Pak.J.Biochem. Mol. Biol. 30, 1-21.

70. Akhtar M. Saleem, Mahjabeen, Saleem and M.W. Akhtar (1997) Cloning and expression of *Bacillus subtilis* endoglucanase gene in *E. coli*. Pak.J.Biochem. Mol. Biol. 30, 27-32.

71. Nabila Roohi, A.M. Cheema, Nazia Rashid and M. Waheed Akhtar (1997) Plasma free amino acid fractions in differing phases of reproduction in dwarf nanny goat. Punjab Univ. J. Zoology, 12: 32-42.

72. Roohi, N., Cheema, A.M., Qureshi, S.K. and Akhtar, M.W. (1998) Effect of glucagon on plasma metabolites in early lactating dwarf goats. Pak. J. Biochem. Mol. Biol., 31, 75-81.

73. Nabila Roohi, Ammara Iftikhar, A.M. Cheema and M. Waheed Akhtar (1998) Serum protein profile in differing phases of reproduction in dwarf goat. Pak. J. Sci. Res., 50: 47-54.

74. Saleem, Mahjabeen, M. saleem Akhtar, M. Waheed Akhtar (1998) Purification and characterisation of xylanase from *E. coli* carrying pMS1, 31, 67-74.

75. Roohi, N., A.M. Cheema, Humaira Mushtaq and M. Waheed Akhtar (1999) Serum protein patterns in fed, fasted and insulin treated diabetic male dwarf goat, Pak.J.Sci.Res., 51: 66-70.

76. M. Cheema, Nabila Roohi, Saima Munir and M. Waheed Akhtar (1998) Serum protein fractions in hyperthyroid women. Punjab Univ. J. Zoology, 13, 1-7.

77. Roohi, N., Cheema, A.M., Liaquat S. and Akhtar, M.W. (1999) Effect of cortisone on plasma metabolites in early lactating dwarf goats. Pak. J. Biochem. Mol. Biol. 32, 43-47.

78. Roohi, N., Cheema, A.M. afzal, M. and Akhtar, M.W. (1999) Plasma metabolites in normal and glucose loaded dwarf goats in lactation. Pak. J. Sci. 51: 31-35.

79. Roohi, N., Cheema, A.M. Mushtaq, H. and Akhtar, M.W. (1999) Serum protein patterns in fed, fasted and insulin treated diabetic male dwarf goats. Pak.J. Sci. Res. 51, 66-70.

80. Roohi, N. Cheema, A.M., Muhammad A.F. and Akhtar, M.W. (1999) Electrophoretic analysis of various protein fractions in female subjects with hypothyroid states. Pb. Univ. J. Zoology, 14, 25-32.

81. Saleem, Mahjabeen, M. Saleem Akhtar and M. Waheed Akhtar (1999) Cloning and expression of *Bacillus subtilis* xylanase gene in *E. coli*, Pak. J. Biochem. Mol. Biol. 32, 12-17.

82. Khurshid, R. Akhtar, N., Sheikh, M.A., Tabbasum, F., Tabbasum, F., and Akhtar, M. W. (1999) Diagnostic testing for bacterial meningitis in infants, Biomedica, 15, 97-99.

83. Akhtar, M. Saleem, Mahjabeen Saleem and M. Waheed Akhtar (2000) Production of cellulases from *Bacillus subtilis* strain grown on lignocellulosic substrates. Pak. J. Biochem. Mol. Biol. 33, 47-50.

84. Chengzee, Mahmood and M. Waheed Akhtar (2000) Prevalence of thyroid peroxidase auto-antibodies during pregnancy and post-partum period. Mother and Child, 38, 116-119.

85. Chengzee, Mahmood, Nasim R. Khan and M. Waheed Akhtar (2000) Evaluation of thyroid disorders on the basis of SDS- PAGE electrophoresis. Mother and Child, 38, 138-144.

86. Chengzee, Mahmood, Zafar Iqbal, Nasim R. Khan and M. Waheed Akhtar (2000) Impact of socioeconomic factors in the prevalence of thyroid disorders at Sheikh Zayed Hospital, Lahore. Punjab Univ. J. Zool., 15, 201-204.

87. Akhtar, M. Saleem, Mahjabeen Saleem, M. Waheed Akhtar (2001) Saccharification of lignocellulose materials by the cellulases of *Bacillus subtilis.* Intern. J. Agric. Biol, 3, 199-202.

88. Mahjabeen Saleem, M. Saleem Akhtar and M. Waheed Akhtar (2001) Applications of xylanase in saccharification of lignocellulosics and pulp bleaching. Pak. J. Biochem. Mol. Biol. 34, 30-37.

89. S Mahjabeen, MS Akhtar, MW Akhtar (2001) Purification of cell-bound p-xylosidase produced by locally isolated Bacillus subtilis Pakistan Journal of Science 53, 43.

90. Asma Saeed, M. Iqbal, and M.Waheed Akhtar, (2002) Applications of biowaste materials for the sorption of heavy metals in contaminated aqueous medium. Pak. J. Sci. Ind. Res., 45, 206-211.

91. Sarah Ahmad, Saima Naz, Farkhanda Ghafoor, M. Saleem Akhtar, Mahjabeen saleem, and M. Waheed Akhtar (2003) Electrophoretic analysis of serum proteins in prostrate cancer. Pak. J. Med. Res. 43, 15-18.

92. Nadia Azhar, Sumera Batool and M. Waheed Akhtar (2003) RT-PCR amplification of growth hormone gene of local ovine breeds. Pak. J. Biochem. Mol. Biol. 36, 128-132.

93. Shamim Ahmad Siddiqui, Abdul Majeed Cheema, M. Waheed Akhtar, and Khatoon Akhtar Bano (2004) Glycosylated haemoglobin, serum lipids, lipoproteins and vascular complications in insulin resistant type-2 diabetes in Pakistani population. Pak J. Biochem. Mol. Biol. 37, 1-8.

94. Shamim Ahmad Siddiqui, Abdul Majeed Cheema, M. Waheed Akhtar, and Khatoon Akhtar Bano (2004) Serum lipids and lipoproteins abnormalities in insulin resistant type-2 diabetics of different age groups. Pak. J. Biochem. Mol. Biol. 37, 60-66.

95. Saima Naz, Sarah Ahmad, Farkhanda Ghafoor, Nadeem Shafique Butt, and M. Waheed Akhtar (2004) Free and total prostate specific antigen in benign prostate hyperplasia and prostate cancer. JCPSP 14, 69-71.

96. Asma Saeed, M. Waheed Akhtar, and M. Iqbal (2004) A comparative study on cadmium biosorption characteristics of some microalgae. Pak. J. Biochem. Mol. Biol. 37, 121-127.

97. Farkhanda Ghafoor; Mussarat Mansoor; Tahir Malik; Ray Edwards, M.Waheed Akhtar (2004) Frequency of thyroid autoimmunity among pregnant women using locally developed enzyme assay for anti-thyroid peroxidase. Pak J. Biochem. Mol. Biol. 37 (4), 162-166.

98. Sadaf, S., Damasceno, L.M., Wilson, D.B. and Akhtar, M. W. (2005) Cloning and expression of a novel somatotropin gene in bacterial and yeast expression. FEBS J., 272 (Supplement 1): L3-038P.

99. Asma Saeed, M. Iqbal, and M. Waheed Akhtar (2005) Removal and recovery of lead (II)from single and multimetal (Cd, Cu, Ni, Zn) solutions by crop milling waste (black gram husk). J. Hazardous Materials, B117, 65-73.

100. Asma Saeed, M. Waheed Akhtar and Muhammad Iqbal (2005) Affinity relationship of heavy metal biosorption by the husk of Cicer arientinum (chickpea var. black gram) with their atomic weights and structural features. Frenus. Environ. Bul. (Germany) Vol. 14, No. 3.

101. Asma Saeed, M. Iqbal, and M. Waheed Akhtar (2005) Removal and recovery of heavy metals from contaminated water using papaya wood as a new biosorbent. Separation and Purification Technol. 45, 25-31.

102. Shameem Ahmad Siddiqui, Abdul Majeed Cheema, M. Waheed Akhtar, Khatoon Akhtar Bano (2005) Study of serum insulin, liver profile and protein levels of insulin resistant type-2 diabetics in Pakistani population. Pak J. Biochem. Mol. Biol. 38, 92-97.

103. Farkhanda Ghafoor, Mussarat Mansoor, Tahir Malik, Saleem Malik, Aman ullah Khan, Ray Edwards and M. Waheed Akhtar, (2006) Role of thyroid peroxidase antibodies in the outcome of pregnancy J. College Physicians Surgeons 16, 468-471.

104. M. I. Rajoka, Khalil-ur-Rehman, Munazza Meraj, M. Waheed Akhtar and M.A. Zia. (2006) Purification and properties of a bovine uricase. Protein and Peptide Letters 13, 363-368.

105. Ibrahim Rajoka, M. Waheed Akhtar, Atif Hanif and A.M. Khalid (2006) Production and Characterisation of a highly active cellobiase from *Aspergillus riger* grown in solid state fermentation. World J. Microbiol. Biotechnol. 22, 991-998.

106. Saima Sadaf, M. Altaf Khan and M. Waheed Akhtar (2007) Production of bubaline somatotropin by auto-induction in shake-flask cultures. Biotechnol. Appl. Biochem. 47, 21-26.

107. S. Sadaf, M. A. Khan, D. B. Wilson and M. W. Akhtar (2007) Molecular cloning, characterization and expression studies of water buffalo (*Bubalus bubalis*) somatotropin. Biochemistry (Moscow) 72, 162-169.

108. Kalsoom Akhtar, M. Waheed Akhtar, Ahmad M. Khalid (2007) Removal and recovery of uranium from aqueous solution by *Trichoderma harzianum*. Water Research 41 (6), 1366-1378.

109. M. Altaf Khan, Saima Sadaf and M. Waheed Akhtar (2007) Role of silent gene mutations in the expression of caprine growth hormone in *Escherichia coli*. Biotechnology Progress, Vol. 23, 1049-1052.

110. Nadia Ikram, Shumaila Naz, Saima Sadaf, and M. Waheed Akhtar (2008) Over-expression of caboxypeptidase of extreme thermophile *Pyrococcus furiosus* in *Escherichia coli*. Pak. J. Biochem Mol. Biol. 41, 57-61.

111. Shameem A. Siddiqui, M. Zaheer Baig, A. Majeed Cheema, M. Waheed Akhtar, and K. Akhtar Bano (2008) Insulin resistance and cardiovascular risks in type-2 diabetic population. Medical Forum 19 (11), 35-41.

112. Nadia Ikram, Shumaila Naz and M. Waheed Akhtar (2008) Expression of prolyl endopeptidase of *Pyrococcus furiosus* in a partially folded form in *E. coli*. Pak. J. Biochem. Mol. Biol. 41, 153-157.

113. Najam-ul-Sahar Sadaf Zaidi, Saima Sadaf and M. Waheed Akhtar (2008) Cloning and over-expression of *Pyrococcus furiosus* endoglucanase A gene (eglA) in *Escherichia coli*. Pak. J. Biochem. Mol. Biol. 41, 172-175.

114. Saima Sadaf, M. Altaf Khan and M. Waheed Akhtar (2008) Expression enhancement of bubaline somatotropin in *E. coli* through gene modifications in the 5'-end coding region. J. Biotech. 135, 134-139.

115. Kalsoom Akhtar, M. Waheed Akhtar, Ahmad Mukhtar Khalid (2008) Removal and recovery of zirconium from its aqueous solution by *Candida tropicalis*. J. Hazardous materials 156, 108-117.

116. M. W. Akhtar, (2008) Role of 5'-end coding sequence on gene expression and protein folding in *E. coli*. FEBS J., 275 (Supplement 1): PP2C-3.

117. Saima sadaf, M.A. Khan, and M.W. Akhtar (2008) Expression enhancement of bubaline somatotropin in E. coli through gene modification in the 5'-end coding region. FEBS J., 275 (Supplement 1): YSF-103.

118. Naila Rabbani, Saadia Shehzad Alam, Samreen Riaz, James Larkin, M. Waheed Akhtar, Tahir Shafi and Paul J. Thornalley (2009) High dose thiamine therapy for people with type 2 diabetes and microalbuminuria: a randomized, double-blind, placebo-controlled study. Diabetologia 52, 208-212.

119. Akhtar K., Khalid A. M, Akhtar M. W. and. Ghauri M. A. (2009) Removal and recovery of uranium from aqueous solutions by Ca-alginate immobilized Trichoderma harzianum. Bioresource Technology, 100, 4551-4558.

120. Rabbani, N., Shahzad Alam, S., Riaz, S., Larkin, J.R., Akhtar, M.W., Shafi, T. and Thornalley, P.J. Response to comment on Rabbani et al. (2009) High dose thiamine therapy for patients with type 2 diabetes and microalbuminuria: a pilot randomised, double-blind, placebo-controlled study. Diabetologia, 52(2): 208 - 212, 2009. Diabetologia. 52 (6): 1214-1216.

121. Samreen Riaz, Saadia S. Alam, Mehreen Raza, Shahida Hasnain and M. Waheed Akhtar (2009) Obesity as risk factor and study of obesity related proteins in diabetes mellitus. African J. Biotechnol. 8 (5), 737-744.

122. M. Altaf Khan, Saima Sadaf, Muhammad Sajjad, and M. Waheed Akhtar (2009) Production enhancement and refolding of caprine growth hormone expressed in *E. coli*. Protein Expression and Purification 68, 85-89.
123. M. Siddique Awan, Fatima Jalil, Najma Ayub, M. Waheed Akhtar, and M. Ibrahim Rajoka (2009) Multiple mutation conferred hyperproduction of a thermostable α-galactosidase in solid-state fermentation. Food Technol. Biotechnol.47, 370-380.
124. Nadia Ikram, Shumaila Naz, M. Ibrahim Rajoka, Saima Sadaf and M. Waheed Akhtar (2009) Enhanced production of subtilisin of *Pyrococcus furiosus* expressed in *E. coli* using auto-inducing medium. African J. Biotechnol. 8, 5867-5872.
125. Nadia Ikram, Shumaila Naz and M. Waheed Akhtar, (2009) Characterisation of a novel protease producing *Serratia* Sp. isolated from soil. Pak. J. Biochem. Mol. Biol. 42, 165-172.
126. M. Sajjad, M. Imran M. Khan, Nadeem S. Akbar, Sajjad Ahmad, Imran Ali, and M. Waheed Akhtar (2010) Enhanced expression and activity yields of *Clostridium thermocellum* xylanases without non-catalytic domains. J. Biotechnol. 145, 38-42.
127. Samreen Riaz, Saadia Shehzad Alam and M. Waheed Akhtar (2010) Proteomic identification of human serum biomarkers in diabetes mellitus type 2. J. Pharm. Biomed. Anal. 51, 1103-1107.
128. Shumaila Naz, Nadia Ikram, M. Ibrahim Rajoka, Saima Sadaf and M. Waheed Akhtar (2010) High-level expression of β-glucosidase gene of *Bacillus halodurans* in *E. coli* and its characterization. Biochemistry (Moscow) 75 (4), 513-518.
129. S.A.I. Bokhari, F. Latif, M.W. Akhtar and M.I. Rajoka (2010) Mutation imparted hyper-production of thermostable β-xylosidase on *Humicola lanuginose* in solid state fermentation. Annals of Microbiol. 60, 21-29.
130. Imran M. Khan, M. Sajjad, and M. Waheed Akhtar (2010) Influence of transposition and insertion of additional binding domain on expression and characteristics of Xylanase C of *Clostridium thermocellum.* J. Biotechnol. 150, 1-5.
131. Samreen Riaz, Saadia S. Alam, Vernon Skinner, Kaila Srai, Aasma Riaz and M. Waheed Akhtar (2010) Proteomic identification of human urinary biomarkers in diabetes mellitus type 2. Diabetes Technology and Therapeutics 51, 1103-1107.
132. Shumaila Naz, Nadia Ikram, Saima Sadaf, M. Waheed Akhtar (2010) 5′-end coding sequence of β-glucosidase gene of *Bacillus halodurans* determines the rate of expression and folding of the product in *E. coli.*Pak. J. biochem. Mol. Biol. 43, 115-120.
133. M. Altaf Khan, Saima Sadaf and M. Waheed Akhtar (2010). Sequence analysis, high-level expression and one-step purification of recombinant caprine growth hormone Pak. J. biochem Mol. Biol. 43, 163-168.
134. Saadia Shahzad Alam, Samreen Riaz and M. Waheed Akhtar (2011) Effect of high dose thiamine therapy on activity and molecular aspects of transketolase in Type 2 diabetic patients. Afr. J. Biotechnol. 10(75), 17305-17316.
135. Roquyya Gul, Farkhanda Ghafoor, Saima Sadaf and M. Waheed Akhtar (2011) Developing an improved competetive enzyme immunoassay for Beetal caprine growth hormone. Pak. J. Biochem. Mol. Biol. 44,148-52.
136. Roquyya Gul, Saima Sadaf and Muhammad Waheed Akhtar (2012) Expression and sequence characterization of growth hormone binding protein of *Nili-Ravi* buffaloe (*Bubalus bubalis*).
African Journal of Biotechnology 11, 12103-12109.
137. Muhammad Sajjad, M. Imran Mahmood Khan, Rehan Zafar, Sajjad Ahmad, Umar H.K. Niazi, Muhammad Waheed Akhtar (2012) Influence of positioning of carbohydrate binding module on the activity of endoglucanase CelA of *Clostridium thermocellum*. Journal of Biotechnology 161, 206-212.
138. Saima Sadaf, Shaista Bashir and M. Waheed Akhtar (2012) Enhanced production and refolding of human leptin expressed in *Escherichia coli.* Pak. J. Biochem Mol. Biol. 45, 15-19.
139. Saima Sadaf, M.Waheed Akhtar and Zarina Iqbal (2012) Uncertainty over pharmaceutical and biotech product patents in Pakistan. Nature Biotechnology 30, 1198-1200.
140. Saadia Shahzad Alam, Samreen Riaz and M. Waheed Akhtar (2012) Effect of high dose thiamine therapy on risk factors in type 2 diabetics. J. Diabetes and Metabolism, 3, 233-242.
141. Tamseela Mumtaz, Nabila Roohi and M. Waheed Akhtar (2012) Incidence and clinical manifestation of lymphoma in Central Punjab. Pakistan J. Zool. 44(5), 1367-1372.

142. RT Siddiqui, MW Akhtar, JA Qureshi (2013) The presence and copy number of insertion sequence IS6110 in *Mycobacterium tuberculosis* isolates from Pakistan. International Journal of Agriculture and Biology, 15, 607-611.
143. Imran M. Khan, M. Sajjad, Sajjad Ahmad and M. Waheed Akhtar (2013) Effect of induction at different growth stages on the expression of β-1,4 xylanase of *Clostridium thermocellum*. Pak. J. Biochem. Mol. Biol. 45, 47-51.
144. Sana Khurshid, Ruqyya Khalid, Madeeha Afzal and M. Waheed Akhtar (2013) Truncation of PstS1 antigen of *Mycobacterium tuberculosis* improves diagnostic efficiency. Tuberculosis 93, 654-659.
145. Imran M. Khan, M. Sajjad, Saima Sadaf, Rehan Zafar, Umar H.K. Niazi, and M. Waheed Akhtar (2013) Influence of transposition and insertion of additional binding domain on expression and characteristics of XylanaseZ of *Clostridium thermocellum.* J. Biotechnology 168, 403-408 .
146. Sajjad Ahmad, Hui Ma, Muhammad Waheed Akhtar, Yi-Heng Percival Zhang and Xiao-Zhou Zhang (2014) Directed evolution of *Clostridium phytofermentans* glycoside hydrolase family endoglucanase for enhanced specific activity on solid cellulosic substrate. Bioenergy Research 7, 381-388.
147. Saima Sadaf, Hammad Arshad, M. Waheed Akhtar (2014) A non-ionic surfactant reduces induction time and enhances expression levels of bubaline somatotropin in *Pichia pastoris*. Mol. Biol. Reports 41, 855-863.
148. R. Gul, R. Alam, M. Sleem, M. Ali, S. Mehmood, M. W. Akhtar (2014) Binding properties of beetal recombinant caprine growth hormone to Bovidae liver microsomal membranes. African J. Biotechnology 13(30), 3081-3091.
149. Sana Khurshid, Ruqyya Khalid, Madeeha Afzal, Imran Khan and M. Waheed Akhtar (2014) Improved immunoassay using TB16.3-echA1 fusion protein for serodiagnosis of tuberculosis. Tuberculosis 94(5), 519-524.
150. Imran Ali, Rehana Asghar, Sajjad Ahmed, Muhammad Sajjad, Muhammad Tariq, M. Waheed Akhtar (2015) mRNA secondary structure engineering of *Thermobifida fusca* endoglucanase (Cel6A) for enhanced expression in *E. coli.* World J. Microbiol. Biotech. 31, 499-506.
151. Saima Sadaf, Monazza Rashid, Romana Sarwar, Samina Kausar and M. Waheed Akhtar (2015) Molecular cloning expression analysis of somatotropin gene of an indigenous chicken breed. Pak J. Biochem. Mol, Biology 48, 7-14.
152. Saher Shahid, Razia Tajwar and M. Waheed Akhtar (2015) Effect of mRNA secondary structure on expression level of *Caldicellulosiruptor saccharolyticus* DSM 8903 in *E. coli.* Pak J. Biochem. Mol, Biology 48, 22-28.
153. Madeeha Afzal, Sana Khurshid, Ruqyya Khalid, Rehan Z Paracha, Imran H Khan, M Waheed Akhtar (2015) Fusion of selected regions of mycobacterial antigens for enhancing sensitivity in serodiagnosis of tuberculosis J. Microbiological Methods 115, 104-111.
154. Faiza Gul Durrani, Roquyya Gul, Saima Sadaf and Muhammad Waheed Akhtar (2015) Expression and rapid purification of recombinant biologically active ovine growth hormone with DsbA targeting to Escherichia coli inner membrane. Appl Microbiol Biotechnol . 99(16), 6791-6801.
155. Asia Khaliq, Imran H. Khan, M. Waheed Akhtar, M. Nawaz Chaudhry (2015) Environmental Risk Factors and Social Determinants of Pulmonary Tuberculosis in Pakistan. Epidemiology 5:3.
156. Shaista Bashir, Saima Sadaf, Sajjad Ahmad and M. Waheed Akhtar (2015) Enhanced and secretory expression of human granulocyte colony stimulating factor by *Bacillus subtilis* SCK6. Biomed Research International 2015, dx.doi.org/10.1155/2015/636249.
157. R Khalid, M Afzal, S Khurshid, RZ Paracha, IH Khan, MW Akhtar, (2016) Fusion molecules of heat shock protein HSPX with other antigens of *Mycobacterium tuberculosis* show high potential in serodiagnosis of tuberculosis. PLOS ONE 11 (9), e0163349.
158. Saba Ghazanfar, Iram Fatima, Muhammad Aslam, Syed Ghulam Musharraf, Nicholas E. Sherman, Christopher Moskaluk, Jay W. Fox, M. Waheed Akhtar, Saima Sadaf (2017) Identification of actin beta-like 2 (ACTBL2) as novel, upregulated protein in colorectal cancer. *Journal of Proteomics* 152, 33-40.
159. Iram Fatima, Saima Sadaf, Syed Ghulam Musharraf, Naghma Hashmi and Muhammad Waheed Akhtar (2017) CD5 molecule-like and transethyretin as putative biomarkers of chronic myeloid leukemia - an insight from proteomic analysis of human plasma. Scientific Reports | 7:40943 | DOI: 10.1038/srep40943.
160. Aasia Khaliq, Resmi Ravindran, Syed Fahadulla Hussainy, Viswanathan V. Krishnan, Atiqa Ambreen, Noshin Wasim Yusuf, Shagufta Irum, Abdul Rashid, Muhammad Jamil, Fareed Zafar, Muhammad Nawaz Chaudhary,

Puneet K. Gupta, Muhammed Waheed Akhtar and Imran H. Khan (2017) Field evaluation of a blood based test for active tuberculosis in endemic settings PLoS ONE 12(4): e0173359. https://doi.org/10.1371/journal.pone.0173359

161. Shaista Bashir, Mudassir Iqbal, Saima Sadaf , M. Waheed Akhtar (2017) Synonymous codon changes at the 5′-end of the gene strongly impact the heterologous protein expression in *Escherichia coli.* Applied Biochemistry and Microbiology 53 (3), 296–303.
162. Sana Khurshid, Madeeha Afzal, Ruqyya Khalid, Muhammad W Akhtar, and Mahmood H Qazi, (2017) Potential of multi-component antigens for tuberculosis diagnosis. Biologicals. http:// dx.doi.org/10.1016/j. biologicals. 2017.04.004
163. Razia Tajwar, Sahar Shahid, Rehan Zafar, M. Waheed Akhtar (2017) Impact of orientation of carbohydrate binding modules family 22 and 6 on the catalytic activity of Thermotoga maritima xylanase XynB. Enzyme Microbial Technology 106, 75-82.
164. Sahar Shahid, Razia Tajwar and M. Waheed Akhtar (2017) A novel trifunctional, family GH10 enzyme from Acidothermus cellulolyticus 11B, exhibiting endo-xylanase, arabinofuranosidase and acetyl xylan esterase activities. Extremophiles doi.org/10.1007/s00792-017-0981-8.
165. Abdul Basit, M. Waheed Akhtar (2018) Truncation of the processive Cel5A of *Thermotoga maritima* results in soluble expression and several fold increase in activity. J. Biotechnology & Bioengineering 115:1675–1684.
166. Basit A, asghar F, Sadaf S, Akhtar MW (2018) Health improvement of human hair and their reshaping using recombinant keratin K31, *Biotechnology Reports*, https://doi.org/10.1016/j.btre.2018.e00288
167. Afia M. Akram, Humera kausar, Asma Chaudhary, A Mukhtar Khalid, M. Mudassar Shahzad, M. Waheed Akhtar, M. Farooq Sabar, Nadia Sajid, Nawaf Al Anazi, Aamir Aleem, Zafar Iqbal (2018) Detection of Exon 12 and 14 Mutations in Janus Kinase 2 Gene Including a Novel Mutant in V617F Negative Polycythemia Vera Patients from Pakistan. *Journal of Cancer*, 9: 4341-45.
168. Asma Tariq, Rana M. Mateen, Iram Fatima and M. Waheed Akhtar (2019) Calreticulin is Differentially Expressed in Invasive Ductal Carcinoma: A Comparative Study. *Current Proteomics*, 2018, 15, 000-0001
169. Abdul Basit, Saima Sadaf, Yang Zhang and M. Waheed Akhtar (2019) Improving activity of a highly thermostable cellulase Cel12A of *Thermotoga neapolitana* through directed evolution. J. Biotechnology 306
170. S Shahid, J Shaheen, W Shahid, MW Akhtar, S Sadaf (2019) mir-16-5p as a Suitable Reference Gene for Normalization of Quantitative Real Time PCR in Acute Lymphoblastic Leukemia. Pakistan Journal of Zoology 51 (2).
171. J Shaheen, S Shahid, S Shahzadi, MW Akhtar, S Sadaf (2019) Identification of Circulating miRNAs as Non-Invasive Biomarkers of Triple Negative Breast Cancer in the Population of Pakistan.Pakistan Journal of Zoology 51 (3),118-124.
172. Shahzadi Noreen, Qurratulann Afza Gardener, Iram Fatima, Saima Sadaf, and Muhammad Waheed Akhtar (2020) Upregulated expression of calcium dependent Annexin A6: A potential prognostic indicator of ovarian carcinoma. PROTEOMICS-Clinical Applications 14(2) 1900078.
173. Mohsina Akhter, Shaista Arif, Aasia Khaliq, Zaib un Nisa, Imran H. Khan and Muhammad Waheed Akhtar (2020) Designing fusion molecules from antigens of *Mycobacterium tuberculosis* for detection of multiple antibodies in plasma of TB patients. Tuberculosis124, 101981.
174. Tahir, S., Iqbal, M.M., Akhtar, M. Waheed, Wang, W., Sun, T., Sadaf, S. (2020) SUMO-fusion and autoinduction-based combinatorial approach for enhanced production of bioactive human interleukin-24 in *Escherichia coli.* Applied Microbiol. Biotechnol. 104(22), 9671-82.
175. Imran Ali, Hafiz Muzzammel Rehman, Muhammad Usman Mirza, M. Waheed Akhtar, Rehana Asghar, Muhammad Tariq, Rashid Ahmed, Fatima Tanveer, Hina Khalid, Huda Alghamdi, Matheus Froeyen (2020) Enhanced thermostability and enzymatic activity of Cel6A variants from *Thermobifida fusca* by empirical domain engineering. Biology 9, 214; doi:10.3390/biology9080214.
176. Khaliq, Aasia, Resmi Ravindran, Samia Afzal, Prasant Kumar Jena, Muhammad Waheed Akhtar, Atiqa

Ambreen, Yu-Jui Yvonne Wan, Kauser Abdulla Malik, Muhammad Irfan, and Imran H. Khan. "Gut microbiome dysbiosis and correlation with blood biomarkers in active-tuberculosis in endemic setting." *PloS one* 16, no. 1 (2021): e0245534.

177. Shahzadi Noreen, Safa Akhtar, Tahira Batool, Qurratulann Afza Gardner & Muhammad Waheed Akhtar (2021) Tubulin beta 2C chain (TBB2C), a potential marker of ovarian cancer, an insight from ovarian cancer proteome profile. ACS Omega https://dx.doi.org/10.1021/acsomega.0c03262
178. Shaista, Arif, Akhter, Mohsina, Khaliq, Aasia, Nisa, Zaib Un, Khan, Imran H. and Akhtar, Muhammad Waheed (2021) Serodiagnostic evaluation of fusion proteins from multiple antigens of Mycobacterium tuberculosis for active TB. Tuberculosis 127, 1020153.
179. Sadaf Sulman, Benjamin O Savidge, Kawther Alqaseer, Mrinal Kumar Das, Neda NezamAbadi, John Edward Pearl, Obolbek Turapov, Galina V Mukavalova, M. Waheed Akhtar, Andrea May Cooper. (2021) Balance between protection and pathogenic response to aerosol challenge with *Mycobacterium tuberculosis* (*Mtb*) in mice vaccinated with TroFu64, a fusion consisting of three *Mtb* antigens. Vaccines 9, 519. https:/ /doi.org/10.3390/vaccines9050519.
180. Sadaf Sulman, Saher Shahid, Aasia Khaliq, Atiqa Ambreen, Imran H. Khan, Andrea M. Cooper, Muhammad Waheed Akhtar (2021) Enhanced serodiagnostic potential of a fusion molecule consisting of Rv1793, Rv2628 and a truncated Rv2608 of Mycobacterium tuberculosis. PLoS ONE 16(11): e0258389.
181. Samiah Shahid, Wajeehah Shahid, Jawaria Shaheen, M. Waheed Akhtar & Saima Sadaf (2021) Circulating miR- 146a expression as a non- invasive predictive biomarker for acute lymphoblastic leukemia. Scientific Reports (2021) 11:22783 |
182. Ambreen Tauseef, Asima Karim, Gulfam Ahmad, Qurratulann Afza Gardner & Muhammad Waheed Akhtar (2021) Proteomic Profile Mapping and Differential Expression of Protein in Ovarian Cancer (Pemetaan Profil Proteomik dan Ungkapan Pembezaan Protein dalam Kanser Ovari. Sains Malaysiana 50(12, 3665-3679 *http://doi.org/10.17576/jsm-2021-5012-17*
183. Chandni Yaqoob, Saher Shahid, Aasia Khaliq, Zaib un Nisa, Imran H. Khan and M. Waheed Akhtar (2022) Designing fusion molecules from antigens of Mycobacterium tuberculosis to enhance serodiagnostic sensitivity in latent TB infection and active TB state. International Journal of Peptide Research and Therapeutics 28:30 https://doi.org/10.1007/s10989-021-10341-6.
184. Madiha Mumtaz, Irene V. Bijnsdorp, Franziska Böttger, Sander R. Piersma, Thang V. Pham, Samiullah Mumtaz, Ruud H. Brakenhoff, M. Waheed Akhtar and Connie R. Jimenez (2022) Secreted protein markers in oral squamous cell carcinoma (OSCC). Clinical Proteomics *19:4* https://doi.org/10.1186/s12014-022-09341-5.
185. Sajjad Ahmad, Muhammad Sajjad, Hisham N Altayb, Syed Sarim Imam, Sultan Alshehri, Mohammed M Ghoneim, Saher Shahid, Muhammad Usman Mirza, Muhammad Shahid Nadeem, Imran Kazmi, Muhammad Waheed Akhtar (2022) Engineering processive cellulase (CelO) of *Clostridium thermocellum* to divulge the role of carbohydrate binding module. Biotechnology and Applied Biochemistry; Biotechnol Appl Biochem doi: 10.1002/bab.2352.
186. Arif S, Akhter M, Khaliq A, Akhtar MW (2022) Fusion peptide constructs from antigens of M. tuberculosis producing high T-cell mediated immune response. PLoS ONE 17(9): e0271126.
187. Nasir Mahmood, Mohsina Akhter, Naveed Hussain, Mohsin Shad, Zaib un Nisa, Imran H. Khan and Muhammad Waheed Akhtar (2022) The Rv3874-Rv3875 chimeric protein shows a promiscuous serodiagnostic potential for tuberculosis. Tuberculosis. 136, 102253.
188. Saher Shahid, Sana Batool, Aasia Khaliq, Sajjad Ahmad, Hina Batool, Muhammad Sajjad and Muhammad Waheed Akhtar (2023) Improved catalytic efficiency of chimeric xylanase 10B from *Thermotoga petrophila* RKU1 and its synergy with cellulases. Enzyme and Microbial Technology 166, 110213.
189. Fatima Rahman, M. Sajjad and M. Waheed Akhtar (2023) Orientation of Cel5A and Xyn10B in a fusion construct is important in facilitating synergistic degradation of plant biomass polysaccharides. J. Biosc. Bioeng. 135, 274-281.
190. Mohsin Shad, Naveed Hussain, Muhammad Usman, M. Waheed Akhtar, M. Sajjad (2023) Exploration of computational approaches to predict the structural features and recent trends in α-amylase production for industrial applications. Biotechnol Bioeng. 2023;1–25.
191. Mohsin Shad, Muhammad Sajjad, Qurratulann Afza Gardner, Saira Ahmad, Muhammad Waheed Akhtar (2024) Structural engineering and truncation of α-amylase from the hyperthermophilic archaeon *Methanocaldococcus jannaschii*. International J. Biological Macromolecules, 256, 128387

192. Mohsin Shad, Arshia Nazir, Muhammad Usman, Muhammad Waheed Akhtar, and Muhammad Sajjad. "Investigating the effect of SUMO fusion on solubility and stability of amylase-catalytic domain from Pyrococcus abyssi." *International Journal of Biological Macromolecules* (2024): 131310.

193. Mohsin Shad, Hafiz Muzzammel Rehman, Muhammad Waheed Akhtar, Muhammad Sajjad (2024) Structural and functional insights of starch processing α-amylase from hyperthermophilic archaeon *Pyrococcus abyssi.* Carbohydrates Research 539, 109122.

194. Naveed Hussain, Halina Mikolajek, Peter J. Harrison, Neil G. Paterson, Muhammad W. Akhtar, Saima Sadaf, James H. Naismith (2023) An endoglucanase with broad substrate tolerance has the potential for biomass conversion (Submitted Archives of Biochemistry and Biophysics)**.**

195. Shaista Arif, Mohsina Akhter, Aqsa Anwar, Sania Javaid, Zara Ashi, Mohsin Shad, Asad Rahman, Huda Abbas, Fouzia Ashraf, M. Waheed Akhtar, and Muhammad Sajjad. Immunological assessment of NSFu1: A novel fusion molecule constructed from structural proteins of SARS-CoV-2 for improving COVID-19 antibody detection (Submitted World Journal of Microbiology and Biotechnology).

196. Mohsin Shad, Ayesha Liaqat, Arshia Nazir, Naveed Hussain, Khadija Yaqoob, Muhammad Waheed Akhtar, Muhammad Sajjad. Exploration of detailed structural and functional potential of recombinant proteins using cutting-edge bioinformatics tools (Submitted Advancement in Life Sciences).

Invited / plenary talks

1. A series of lectures as a trainer at Workshop on Biochemical Techniques. NIBGE, Faisalabad, Pakistan, March 1985.
2. Cloning and expression of *Cellulomonas flavigena* cellulase genes in *E. coli*. Invited talk FAOBMB Symposium, Kuala Lumpur, Malaysia, Dec 2-5, 1988.
3. Cellulase genes of *Cellulomonas flavigena*. A visiting scientist speaker at Biotechnology Center, Cornell University, Ithaca, USA, April, 1990.
4. Gene cloning techniques and prospects- a plenary talk. 2nd National conference Pakistan Society of Biochemists, Sind University, Jamshoro, April, 1993.
5. Teaching and research in biochemistry in developing countries. Invited talk delivered at the FAOBMB 25th Anniversary Symposium, held at University of Phillipines, 2 Dec., 1997.
6. Research and development in biochemistry and molecular biology in Pakistan. Invited talk at 14th FAOBMB Symposium held at University of Otago, Dunedin, New Zealand, Nov. 30, 1999.
7. State of life sciences in Pakistan- a plenary talk. 6th National Conference, Pakistan Society for Biochemistry and Molecular Biology, University of Khairpur, Pakistan, April, 2001.
8. Akhtar, M. Waheed, (2004) strenghthening Research and Development in our Institutions. Conference on Higher Education in Pakistan, LUMS/World Bank, Lahore.
9. Characterisation and over-expression of growth hormone genes of farm animals. Invited Talk, Symposium "Progress in Animal Research". 30 Nov., 2005, University of Veterinary and Animal Sciences, Lahore, Pakistan.
10. Characterisation of caprine growth hormone gene and its over-expression. Plenary Talk, 8th International Conference Pakistan Society for Biochemistry and Molecular Biology, 5-8 March 2005, University of Karachi, Karachi, Pakistan.
11. Over-expression of proteins of commercial importance by recombinant DNA technology. Plenary Lecture-1, 6th International and 16th National Chemistry Conference "Quality of Life and Chemical Sciences". April 6-8, 2006, Bahauddin Zakariya University, Multan, Pakistan.
12. Development of assays for glycated haemoglobin and bovine growth hormone. Invited Lecture, Review Conference HEC-BC Research Programs. March 2006, Hotel Pearl Continental, Lahore, Pakistan.
13. How much molecular knowledge for life sciences? Plenary Talk, National Workshop on "Application of Molecular Biology Tools for the Improvement of Livestock". 14-16 December, 2006. University of Veterinary and Animal Sciences, Lahore, Pakistan.
14. Production of recombinant proteins for large scale applications. Plenary Talk, First National Pakistan Proteomics Society Workshop "Road Map to Proteome Research" 3-5 Feb. 2007, University of Karachi, Karachi, Pakistan.
15. Ethanol from plant biomass. Presentation in a review meeting for finalizing the project. 5 May, 2007, Planning Commission, Government of Pakistan, Islamabad, Pakistan.

16. Over-expression of recombinant proteins in *E. coli*. Plenary Talk, Workshop on Advanced Techniques in Biotechnology. 28 May-2 June, 2007, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
17. Production and applications of growth hormones for enhancing productivity from farm animals. Plenary Talk in seminar on "Effect of BST on Productive Performance of Ravi-Neeli Buffalo. 15 June, 2007, University of Veterinary and Animal Sciences, Lahore, Pakistan.
18. Production of ethanol from plant biomass. Talk, Review Meeting on the Project "Production of Bioenergy from Plant Biomass" 30 Nov. 2007. Planning Commission, Government of Pakistan, Islamabad, Pakistan.
19. Production of recombinant proteins of commercial importance. Plenary Talk, National Core Group in Life Sciences Conference on "Advances in Biological Sciences". 30-31 Jan., 2008, Bahaududin Zakariya University, Multan, Pakistan.
20. Over-expression of recombinant proteins of commercial importance. Plenary Talk, National Commission of Biotechnology Conference "Recent Advances in Agriculture Biotechnology" 18-19 March, 2008, Islamabad, Pakistan.
21. Translational regulation in the production of recombinant proteins. Invited Talk, Symposium on Molecular Biological Research in Pakistan. 26-27 March, 2008, Center of Excellence in Molecular Biology, University of the Punjab, Lahore, Pakistan.
22. Production of bioethanol from plant biomass. Invited Talk, Annual Review of Research Projects. Ministry of Science and Technology, Government of Pakistan. 10 April, 2008, Islamabad, Pakistan.
23. Regulation of gene expression at translation level in *E. coli*. Plenary talk - Prof. M.I.D. Chughtai Memorial Lecture. 9th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Dec. 17-18, 2008.
24. Enhancing expression of commercially important proteins in *E. coli*. Invited talk at QIBGE, University of Karachi, Feb. 14, 2009.
25. Chromatographic analysis of proteomes. A talk as a resource person on in the international workshop 'Separation Science and the Omics" held at the School of Biological Sciences, University of the Punjab, Lahore, Pakistan, during April 6 – 10, 2009.
26. From genomics to proteomics – an overview. Inaugural talk at the symposium 'Working with Proteins in Post-genomic Era' held at the School of Biological Sciences, University of the Punjab, Lahore, Pakistan, January 6-7, 2010.
27. Role of non-catalytic domains on activities of cellulases and xylanases. Talk in the 14th Biotechnology Symposium, Rimini, Italy, 14–18 Sept., 2010.
28. Engineering proteins for applications. Prof. M. I. D. Chughtai Memorial plenary talk, 10th Biennial Conference of the Pakistan Society for Biochemistry and Molecular Biology, Karachi University, Pakistan, Dec. 1-4, 2010.
29. Engineering proteins for enhancing activities. Prof. Anwar Waqar Memorial plenary lecture, 3rd Inernational Symposium on Molecular Medicine and Drug Research, Karachi University, Pakistan, Jan. 3-6, 2011.
30. Developing enzymes for biomass ethanol production. Invited lecture, Workshop Biotechnology for Economic Development, COMSTECH, Islamabad, 16 – 18 February, 2011.
31. TB diagnostics – an overview. Plenary talk, Project evaluation workshop at EMRO Office, Cairo, Egypt. 24 July, 2011.
32. Binding modules of glycoside hydrolases. Invited lecture at New York State Institute for Basic Research in Developmental Disabilities, Staten Island, New Yor, USA, on 5 Oct. 2011.
33. Trends in TB diagnostics. Invited talk, International Symposium 'Tuberculosis – Epidemiology, Diagnostics and Threrapeutics' held at Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore, Pakistan. 3 Nov., 2011.
34. Role of binding domains in protein function (glycoside hydrolases). Plenary speaker, PAS Conference, 11-12 January, 2012
35. Engineering proteins for improving properties. Plenary talk, National Symposium. Trends in Biochemistry and Biotechnology, Quaide Azam University, Islamabad, Pakistan. 21 Feb., 2012.
36. Engineering proteins for applications. Invited lecture, The University of Lahore, 7 March, 2012.
37. Binding modules and the activities of cellulases and xylanases. Invited talk, BIT's 3rd Symposium on Enzymes and Biocatalysis, Xian, China, 25-28 April, 2012.
38. Binding modules of glycoside hydrolases. Invited talk, 13th FAOBMB Congress, Bangkok, Thailand, 25-29 Nov, 2012.
39. Bioenergy-a powerful alternative. Plenary talk. Lahore Chamber of Commerce and Industry, Lahore, Pakistan, 11 Dec., 2012.

40. Protein engineering – a powerful tool for improvement, Invited talk at International Conference NIBGE, Faisalabad, 22 April, 2013.
41. Biofuels-energy for the future. Invited talk. PCST Conference, Ministry of Science and Technology, Govt. Pakistan, Islamabad, 26-27 June, 2013.
42. Recent Developments on MtB Fusion Proteins. Talk Presentation and Visit to Collaborating Laboratory, September 8th – 19th, 2013, University of California, Davis, USA.
43. Using fusion proteins for serodiagnosis of tuberculosis. 12th Iranian Genetics Congress, 24-26 May, 2014, Shahid beheshti University of Medical Science, Tehran, Iran.
44. MWA Laboratory's Current Research. Lahore Biotechnology Cluster Conference, 18 August, 2014, F. C. College University, Lahore, Pakistan.
45. Plenary talk "Designing Proteins for Improved Properties in Applications" 12th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology held during 2-5 Dec. 2014 at Islamia University, Bahawalpur, Pakistan.
46. Plenary talk "Engineering Proteins for Pharmaceutical and Industrial Applications" in the international conference held on 14-17 Jan., 2015 at HEJ, Karachi University, Karachi.
47. Invited talk "Engineering glycoside hydrolases using binding modules optimally" in the conference on Protein Engineering held on 25-27 Oct., 2015 at Chicago, USA.
48. Plenary talk "Designing Proteins by Substitution, Deletion, Addition, and Fusion" in the conference held on 22-24 Feb. 2016 at Agriculture University, Faisalabad.
49. Invited talk "Designing Fusion Antigens for Serodiagnosis of TB" in BIT's 9th PepCon held on 25-27 April, 2016 at Dalian, China.
50. Invited talk "Construction of molecules from b-cell epitopes of multiple antigens for enhancing serodiagnosis of tuberculosis" in 25th FAOBMB conference held during 5-7 Dec, 2016 at Manila, Philippine.
51. Invited talk "Ethical issues for infectious diseases" Fifth ICLS-KIBGE Conference on Responsible Conduct of Science: Ethical concerns in Medical and Pharmaceutical Practice and Research, held on May 20-22, 2017 at Karachi University, Karachi, Pakistan.
52. Plenary talk "Fusion Antigens for Improving Sensitivity in Serodiagnosis of Tuberculosis" 6th MMDR Conference, Nov. 6-10, 2017, ICCBS, University of Karachi, Karachi.
53. Invited talk "Fusion Antigens for Serodiagnosis of Tuberculosis" Protein and Peptide Conference 2018, March 26-28, 2018, Miami, Florida, USA.
54. Invited talk "Designing proteins for applications- unlimited possibilities" RSC 1st International Conference on Medicinal Chemistry and Drug Research, Oct. 18-19, 2018, COMSTECH, Islamabad, Pakistan.
55. Plenary MID Chughtai Memorial Talk " Techniques for improving and designing proteins" 14th Biennmial Conference PSBMB, Dec. 9-12, 2018, Karachi, Pakistan.
56. Invited talk "Designing molecules for rapid and reliable serodiagnosis of tuberculosis" 27th FAOBMB 44th MSBMB Conference, 19 - 22 August 2019, Kuala Lumpur, Malaysia.
57. Keynote talk "Developing Immunoantigens for Serodiagnosis of Tuberculosis" International Conference on Biomedical Sciences (ICBMS-19) Sep 27-28, 2019, Istanbul, Turkey.
58. Keynote talk "Designing proteins for diagnostic and Therapeutic applications" 2nd International Conference on Applied Biosciences (ICAB 2021) Dec 30-31, 2021, Mohammad Ali Jinnah University, Karachi, Pakistan.
59. Invited talk " Engineering proteins for diagnostic, therapeutic and other applications" International Conference on Advances in Biological Science (ICABS-2023), March 5-6, 2023, School of Biological Sciences, University of the Punjab, Lahore, Pakistan.
60. Keynote talk "Designing Proteins for Therapeutic and Industrial Applications" Presented at 1st UMT International Conference on Life Sciences, "Exploring the Frontiers in Biological Research' on December 13-14, 2023 at University of Management and Technology, Lahore, Pakistan.

Papers presented in scientific meetings/conferences

1. Faiz ur Rehman, M. Waheed Akhtar, M. A. Shahid, and S. Akhtar (1983) Comparison of the various methods for the determination of protein binding of radiolabelled compounds, Proceed. 29th Pak. Sci. Conf. Karachi, P. 2c.
2. Akhtar, M. Waheed, M. Nadeem Nawazish and Bashir Naz (1983) Production of cellulolytic enzymes of *Trichoderma harzianum* p.102, Proceed. 3rd Cong. FAOB, Bangkok
3. Akhtar, M. Waheed and D. J. McConnell (1985) Cloning and expression of endoglucanase genes of *Cellulomonas*. Proceed. International Symposium on Biologically Active Macromolecules, Quetta.

4. Akhtar, M. Waheed and Sami, A. J. (1986) Characterisation of the free and substrate bound cellulases of *Cellulomonas biazotea* PAGE-KfK Symposium/Workshop on Biotechnology in Agriculture and Energy, Faisalabad.
5. Akhtar, M.W. (1986) Molecular cloning of cellulase genes, a research report submitted to UNIDO, Vienna.
6. Akhtar, M. W. (1987) Studies on microbial cellulases and their genes, Proceed. 6th FAOB Symposium, Karachi.
7. Akhtar, M. W. (1988) Characterisation of cellulase genes of *C. flavigena*: a research report submitted to UNIDO,Vienna.
8. Akhtar, M. W., Dowds, B. and McConnnell, D. J. (1988) Endoglucanases of *C. flavigena* and their genes, Proceed. 7th FAOB Symp. 28-30 Nov.,Sym.02.
9. Mah Jabeen, Nadeem Bedar, N. N. Malik and M. W. Akhtar, Regulation and characterisation of xylanase activity of a newly isolated thermophilic *Bacillus* sp. Proceed. Third National Meeting, Pak. Soc. Biochem., Lahore, April 3-6, 1995.
10. Abdullah, N., S. I. Zafar, and M. W. Akhtar, Biodegradation of bagasse by white rot basidiomycete *Trametes versicolor*, Proceed. Third National Meeting, Pak. Soc. Biochem., Lahore, April 3-6, 1995.
11. Rizvi, S. M. Aslam, Zeba Anwar, Mahjabeen Saleem, and M. Waheed Akhtar, Regulation of xylanases in a locally isolated extreme thermophile, Proceed. Third National Meeting, Pak. Soc. Biochem., Lahore, April 3-6, 1995.
12. Akhtar, M. W. and Saleem, M., Characterisation of a highly active xylanase from a thermophilic *Bacillus*, Proceed. 7th FAOBMB Congress, Sydney, Sept. 24-29, 1995.
13. Akhtar, M. Waheed, Enzymes in reducing pollution and quality improvement in cotton Textile industry. Proceed. Seminar on Ecofriendly Textiles, Lahore, p. 55-69, Dec. 10, 1995.
14. Bushra Hanif Butt, Nabila Roohi and M. Waheed Akhtar (1997) Electrophoretically resolved protein patterns in thyrotoxicity in women, Proceed. 4th National Conference, Pak. Soc.Biochem. Mol. Biol. Peshawar.
15. Nabila Roohi, Abdul Majeed Cheema and M.W. Akhtar (1997) Effect of hyperinsulinism, hyperglucagonism and induced hypoinsulinism on protein profile in sera of male dwarf goat. Proceed. 4th National Conference, Pak. Soc. Biochem. Mol. Biol. Peshawar.
16. Saima Sadaf, M. Altaf Khan and M. Waheed Akhtar (2003) Restriction map analysis of somatotropin gene isolated from Pakistani bovine, ovine and caprine breeds. Proceed. 10th FAOBMB Congress, Dec. 7-12, 2003, Bangalore, India.
17. Saima Sadaf, M. Altaf Khan and M. Waheed Akhtar (2004) RT-PCR amplification and sequence analysis of somatotropin gene of Pakistani bovine (water buffalo) breeds. Proceed. ASBMB Annual/ 8th IUBMB Meetings, June 12-16, Boston, USA.
18. M. Altaf Khan, Saima Sadaf, and M. Waheed Akhtar (2004) Cloning and sequence analysis of growth hormone gene of a Pakistani caprine breed. Proceed.17th FAOBMB meeting, Nov. 22-26, 2004, Bangkok, Thailand.
19. Saima sadaf, M. Altaf Khan and M. Waheed Akhtar. High level expression, refolding and characterization of novel bubaline somatotropin in *Escherichia coli*. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
20. Nadia Azhar, Faiza Gul and M. Waheed Akhtar. Cloning, sequencing and over expression of growth hormone gene of local bovine breed. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
21. Najam us Sahar Sadaf Zaidi, Roquyya Gul and M. Waheed Akhtar. Characterization, cloning and sequencing of locally Isolated Cellulolytic, Thermophillic Bacterial Species. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
22. Faiza Gul, Nadia Azhar, Shumaila Naz and M. Waheed Akhtar. Cloning sequencing and over expression of growth hormone gene of local ovine breed. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
23. Nadia Ikram and M. Waheed Akhtar. Cloning and Characterization of the gene product of the two serine proteases of *Pyrococcus furiosus*. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
24. M. Altaf Khan, Saima Sadaf and M. Waheed Akhtar. Cloning, sequencing and expression of local caprine growth hormone. Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.

25. Muhammad Sajjad, Nadeem Shahzad Akbar and M. Waheed Akhtar. Heterologous expression of thermostable endoglucanases in *Escherichia coli* BL21 (DE3). Proceed. 18th FAOBMB Symposium Genomics and Proteomics in Health and Agriculture 20-23 November 2005, Lahore.
26. Muhammad Sajjad, Nadeem Shahzad Akbar, M. Altaf khan, and M. Waheed Akhtar. Heterologous Expression of Endoglucanase (CelA) of *Clostridium thermocellum* in *Escherichia coli* and its refolding. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
27. M. Altaf Khan, Saima sadaf, and M. Waheed Akhtar. Hyperexpression, refolding and one step purification of Caprine Growth Hormone. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
28. Saima Sadaf, M. Altaf Khan, and M. Waheed Akhtar. Molecular cloning, characterization and expression of somatotropin cDNA from water buffalo (Bubalus bubalis). Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
29. Nadia Ikram, Shumaila Naz, M. Altaf Khan and M. Waheed Akhtar. Molecular characterization of thermostable serine proteases from *Pyrococcus furiosus*. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
30. Nadia Azhar, M.Waheed Akhtar, Cloning and over expression of growth hormone gene of local bovine breed. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
31. Najam us Sahar Sadaf Zaidi, and M. Waheed Akhtar, Cloning, Characterization and sequencing of locally Isolated Cellulolytic, Thermophillic Bacterial Species. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
32. Roquyya Gul, Farkhanda Ghafoor and M. Waheed Akhtar, Immunological and receptor binding characteristics of bovine, ovine and caprine growth hormone. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
33. Faiza Gul, Nadia Azhar and M. Waheed Akhtar, Cloning, over expression and sequence analysis of ovine growth hormone gene isolated from local breed. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
34. Shumaila Naz, Nadia Ikram and M. Waheed Akhtar. Cloning and expression of CMCase gene from Alkalophilic *Bacillus* specie. Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
35. Nadeem Shahzad Akbar, M.Sajjad, M. Altaf Khan, and M. Waheed Akhtar. Cloning and Expression of Endoglucanase (EglA) from *Pyrococcus furiosus* in *Escherichia coli.* Proceed. National Symposium on Biotechnology for Economic Prosperity, July 2006, Nathiagali.
36. M. Waheed Akhtar (2007) Production of recombinant proteins for large-scale applications. Plenary Talk, First National Pakistan Proteomics Society Workshop, Feb. 3-5, 2007, Karachi.
37. Samreen Riaz, Saadia Shahzad Alam and M Waheed Akhtar. (2007) Study of protein biomarker for diabetes mellitus type 2 and role of high dose thiamine on their levels. National conference on Proteomics, Genomics and Metabolomics, 23-25 October 2007. Punjab University. Lahore.
38. Samreen Riaz, Saadia Shahzad Alam, Naila Rabbani, Paul J Thornalley and M. Waheed Akhtar,. (2008) Study of Protein Biomarker for Early Diagnosis of Diabetes Mellitus Type 2 using chromatography and Mass Spectrometry analysis. International Conference on Delivery of Therapeutic Marcomolecules. 22nd June to 25th June 2008. Cardiff University, Cardiff, UK
39. Saima Sadaf, M. Altaf Khan and M. Waheed Akhtar. High level expression and production of bubaline somatotropin gene in E. coli. "International Symposium on Biotechnology" held during May 4-8, 2008 at Sfax, Tunisia.
40. Shumaila Naz, M.W.Akhtar (2008) Role of 5´-end coding sequence on gene expression and protein folding in *E. coli.* 33rd FEBS Congress and 11th IUBMB Conference – Biochemistry of Cell Regulation. Athens, Greece, 28 June – 3 July, 2008.
41. Saima Sadaf, M.A. Khan, and M.W.Akhtar (2008) Expression enhancement of bubaline somatotropin in *E. coli* through gene modification in the 5´-end coding region. 33rd FEBS Congress and 11th IUBMB Conference – Biochemistry of Cell Regulation. Athens, Greece, 28 June – 3 July, 2008.
42. Nadia Ikram, Shumaila Naz and M. Waheed Akhtar, Isolation and Characterization of Novel Thermostable Proteolytic *Serrratia* sp. SBS showing Remarkable Dehairing Activity. 10th Biennial Conference, Pakistan

Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.

43. Shumaila Naz, Nadia Ikram and M. Waheed Akhtar,Role of Silent Mutations in the 5'-end Coding Sequence on the Expression of β-glucosidase in *E. coli*. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
44. Muhammad Sajjad, Sajjad Ahmad, M. Imran Mahmood Khan, Imran Ali, and M. Waheed Akhtar, Cloning and Over-expression of XynZ of *Clostridium thermocellum* in *Escherichia coli* BL21 (CodonPlus). 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
45. Samreen Riaz, Saadia Shahzad Alam, Naila Rabbani, Paul J Thornalley and M. Waheed Akhtar, Study of Protein Biomarker for Early Diagnosis of Diabetes Mellitus Type 2 and Role of Thiamine on their Level. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
46. M. Imran Mahmood Khan, M. Sajjad, Sajjad Ahmad, Imran Ali, and M. Waheed Akhtar, Expression Study of a *Clostridium thermocellum* Xylanase (XynC) and its Truncated Derivatives in *Escherichia coli*. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
47. Imran Ali, M. Sajjad, Imran M. Khan, Sajjad Ahmad, and M. Waheed Akhtar, Cloning and Expression of Endoglucanase (Cel6A) of *Thermobifida fusca* in *Escherichia coli* BL21 (CodonPlus). 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
48. Faiza Gul, Roquyya Gul and M.Waheed Akhtar, Effect of Signal Sequence Variation on the Expression and Secretion of Ovine Growth Hormone Gene in *Escherichia coli*. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
49. Roquyya Gul, M. Altaf Khan, Farkhanda Ghafoor, Sumbal Mehmood, M. Waheed Akhtar, Immunological and Receptor Binding Characteristics of Recombinant Caprine Growth Hormone. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
50. Sidra Naeem, Asma Tariq, Tamseela Mumtaz and M. Waheed Akhtar, Study of Protein Biomarker for Early Diagnostic of Colorectal Cancer. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
51. Naila Tabbassum, Iram Fatima, Gulshan Naseer and M. Waheed Akhtar, Study of Protein Biomarkers for Early Diagnosis of Breast Cancer. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
52. Maida Aslam, Saima Sadaf, Ahmad Mukhtar Khalid and M. Waheed Akhtar, Analyses of Genomic Polymorphism in Growth Hormone and Growth Hormone Receptor Genes of Local Bubaline Breeds. 10th Biennial Conference, Pakistan Society for Biochemistry and Molecular Biology, Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.
53. Samreen Riaz, Saadia Shahzad Alam, Naila Rabbani, Paul J Thornalley and M. Waheed Akhtar, (2009) Study of Protein Biomarker for Diabetes Mellitus Type 2 and role of thiamine on their levels. International Conference on Biotechnology: trends and applications. 18-20 Feb.2009. King Saud University, Riyadh , Saudi Arabia.
54. Afzal, M., and Akhtar, M.W. 2010. Recombinant production of *Mycobacterium tuberculosis* protein antigens for the subsequent development of serodiagnostic assay of tuberculosis. Biomolecular Sciences in Development, Biennial Conference of Pakistan Society for Biochemistry and Molecular Biology, December 1-5, 2010, University of Karachi, Karachi, Pakistan.
55. Khalid, R., and Akhtar, M.W. 2010. Cloning and expression of *Mycobacterium tuberculosis* antigen and development of serological assay for the diagnosis of tuberculosis. Biomolecular Sciences in Development, Biennial Conference of Pakistan Society for Biochemistry and Molecular Biology, December 1-5, 2010, University of Karachi. Karachi, Pakistan.

56. Khurshid, S., and Akhtar, M.W. 2010. Recombinant production and purification of *Mycobacterium tuberculosis* protein antigens. Biomolecular Sciences in Development, Biennial Conference of Pakistan Society for Biochemistry and Molecular Biology, December 1-5, 2010, University of Karachi, Karachi, Pakistan.
57. Afzal, M., and Akhtar, M.W. 2013. Multi-epitope fusion protein of *Mycobacterium tuberculosis*: recombinant production and evaluation of its diagnostic value. Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, 2013, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
58. Afzal, M., and Akhtar, M.W. 2013. Serodiagnostic evaluation of multi-epitope fusion proteins of *Mycobacterium tuberculosis.* 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
59. Ahmad, S., Akhtar, M.W., Zhang, Y-H.P., Zhang, X-H. 2013 Directed evolution of *Clostridium phytofermentans* endoglucanase for enhanced specific activity. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
60. Ali, A., and Akhtar, M.W. 2013. Optimization of fermentation condition to enhance production of cellulose. Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, 2013, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
61. Ali, A., and Akhtar, M.W. 2013. Modified growth media ingredient for high cell density and enhanced production of recombinant endoglucanase in bioreactor. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
62. Arshad, H., Sadaf, S., Akhtar, M.W. 2013. Enhanced production of bubaline somatotropin in *Pichia pastoris*. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
63. Bashir, S., Sadaf, S., Akhtar, M.W. 2013. Recombinant production of human granulocyte colony stimulating factor. Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, 2013, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
64. Bashir, S., Sadaf, S., Akhtar, M.W. 2013. Recombinant production of human granulocyte colony stimulating factor (GCSF). 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
65. Basit, A., Sadaf, S., Akhtar, M.W. 2013. Recombinant production of hair keratin K31 for cosmetic application. Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, 2013, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
66. Basit, A., Sadaf, S., Akhtar, M.W. 2013. Recombinant production of hair keratin K31 for cosmetic applications. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
67. Batool, T., and Akhtar, M.W. 2013. Study of protein biomarkers for early diagnosis of uterine cancer. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
68. Dar, Q-A.S., Siddiqui, N.J., Adil, M., Sadaf, S., Akhtar, M.W. 2013. Cell-free nucleic acids in diagnosis of acute myocardial infarction. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
69. Fatima, I., Sadaf, S., Akhtar, M.W. 2013. Characterization of protein markers in chronic myeloid leukemia. Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, 2013, National Institute of Biotechnology and Genetic Engineering, Faisalabad, Pakistan.
70. Fatima, I., Sadaf, S., Akhtar, M.W. 2013. Identification and characterization of protein markers in chronic myeloid leukemia. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
71. Iqbal, M., Sadaf, S., Akhtar, M.W. 2013. Recombinant production and characterization of a therapeutically important cytokine. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan

Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.

72. Javed, K., Ghazanfar, S., Fatima, I., Sadaf, S., Akhtar, M.W. 2013. Biomarker identification of colorectal cancer through proteomics based approaches. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
73. Khalid, R., and Akhtar, M.W. 2013. Recombinant production and characterization of protein antigens of *Mycobacterium tuberculosis*. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
74. Khaliq, A., Khan, I.H., Akhtar, M.W., Chaudhary, M.N. 2013. Rapid identification of infection and drug resistance of tuberculosis through multiplex microbead MDR assay. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
75. Khan, M.I.M., Sajjad, M., Akhtar, M.W. 2013. Influence of additional binding and catalytic domains on expression and characteristics of xylanase Z of *Clostridium thermocellum*. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
76. Khurshid, S., and Akhtar, M.W. 2013. Recombinant production and serodiagnostic evaluation of antigens from *Mycobacterium tuberculosis.* 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
77. Sajjad, M., Khan, M.I.M., Zafar, R., Niazi, Ahmad, S., Niazi, U.H.K., Akhtar, M.W. 2013. Influence of positioning of carbohydrate binding module on the activity of endoglucanase CelA of *Clostridium thermocellum.* 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
78. Shaheen, J., Sadaf, S., Akhtar, M.W. 2013 Methylation specific PCR analysis of RASSF1A gene in breast cancer patients. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
79. Shahid, S., Tajwar, R., Ahmad, S., Akhtar, M.W. 2013. Functional characterization of truncated version of putative endo-xylanase Xyn10B from *Acidothermus cellulolyticus* 11B. 11th Biennial Conference on Molecular Biosciences- Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
80. Tajwar, R., and Akhtar, M.W. 2013. Fusion of family 22 carbohydrate binding module to the N-terminus of xynlanase 10B of *Thermotoga maritime*. 11th Biennial Conference on Molecular Biosciences - Challenges and Opportunities, Pakistan Society for Biochemistry and Molecular Biology, November 25-28, 2013, University of the Punjab, Lahore, Pakistan.
81. Sajjad Ahmad, Saher Shahid, Razia Tajwar, M. Usman Mirza and M. Waheed Akhtar. Engineering cellobiohydrolase (CelO) of *Clostridium thermocellum* to divulge the role of CBM3b. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
82. Razia Tajwar, Saher Shahid, Sajjad Ahmad and M. Waheed Akhtar. Fusion of carbohydrate binding module family 6 and 22 with catalytic domain of xylanase (XynB) of *Thermtoga maritima*. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
83. Muddasir Iqbal, Saima Sadaf and M. Waheed Akhtar. Recombinant production and characterization of therapeutically important cytokines. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
84. Asif Ali and M.Waheed Akhtar. Modified growth media for high cell density and enhanced production of recombinant endoglucanase in a bioreactor. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
85. Tahira Batool, Iram Fatima and M. Waheed Akhtar. Prospective proteomic-based study to identify candidate biomarkers for the diagnosis of uterine cancer. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.

86. Saba Ghazanfar, Kiran Javed, Iram Fatima, Saima Sadaf and M. Waheed Akhtar. Proteomics based approaches for identification of differentially expressed proteins in colorectal cancer. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
87. Anam Jamil and M. Waheed Akhtar. Cloning and expression of human hair keratin K31 rod domain for hair cosmetic application. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
88. Iram Fatima, Saima Sadaf and M. Waheed Akhtar. Plasma protein profiling of chronic myeloid leukemia. 12th International Conference, Pakistan Society for Biochemistry & Molecular Biology, December 4-7 2014, Islamia University, Bahawalpur, Pakistan.
89. Abdul Basit, Saima Sadaf and M. Waheed Akhtar. "Recombinant Production of Keratin for Hair Cosmetic Application" 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
90. Sana Khurshid, Chandni Yaqoob and M. Waheed Akhtar "Expression Enhancement of PstS1 Antigen of *Mycobacterium tuberculosis* after Truncation without affecting its Antigenic Efficiency" 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
91. Madeeha Afzal, Mohsina Akhter and M. Waheed Akhtar "Fusion of Selected Epitopic Regions of Mycobacterial Antigens for Enhancing Sensitivity in Serodiagnosis of Tuberculosis" 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
92. Madeeha Afzal, Sadaf Ilyas and M. Waheed Akhtar "Differential Folding of Multi-Epitopic Fusion Proteins affects the Sensitivity of Immunodiagnostic Tests against *Mycobacterium tuberculosis"* 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
93. Sana Khurshid, Sadaf Sulman and M. Waheed Akhtar "Improving Sensitivity for Serodiagnosis of Tuberculosis using TB 16.3-echA1 Fusion Protein" 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
94. Muhammad Shahzad Ali and M. Waheed Akhtar "Expression and Characterization of Endoglucanase CelX from *Clostridium* spp." 13th Biennial Conference Pakistan Society for Biochemistry and Molecular Biology 25-27th August, 2016, Abbottabad, Pakistan.
95. Mohsin Shad, Muhammad Usman, Muhammad Waheed Akhtar, and Muhammad Sajjad (2023) ''Protein Engineering Approaches for Alpha Amylase Production: From Tools to Applications'' Presented at International Conference on Advances in Biological Sciences (ICABS-2023), held at SBS-PU, Lahore, 06-08, March 2023 (OP-25).
96. Mohsin Shad, Muhammad Usman, Muhammad Waheed Akhtar, and Muhammad Sajjad (2023) ''Structure-Based Protein Engineering and Truncation of the Alpha Amylase from *Methanococcus jannaschii''* Presented at International Conference on Advances in Biological Sciences (ICABS-2023), held at SBS-PU, Lahore, 06-08, March 2023 (PP-16).
97. Mohsin Shad, Muhammad Usman, Muhammad Waheed Akhtar, and Muhammad Sajjad (2023) ''Recombinant Production of Chimeric α-amylase from *Pyrococcus abyssi* and their Purification by Affinity Chromatography'' Presented at International Conference on Advances in Biological Sciences (ICABS-2023), held at SBS-PU, Lahore, 06-08, March 2023 (PP-18).
98. Mohsin Shad, Hafiz Muzammil Rehman, Muhammad Waheed Akhtar, and Muhammad Sajjad (2024) ''Hyperthermophilic α-amylases are Premier Choice for Protein Engineering'' Presented at 9th Invention to Innovation Summit 2024 at the University of Punjab, February 27-28, 2024, University of The Punjab Lahore (PP-74).
99. Mohsin Shad and Muhammad Sajjad (2023) ''Protein Engineering Approaches for Efficient Hydrolysis of Plant Polysaccharides'' Presented at 1st UMT International Conference on Life Sciences, "Exploring the Frontiers in Biological Research' on December 13-14, 2023 at University of Management and Technology, Lahore, Pakistan.
100. Mohsin Shad, Muhammad Waheed Akhtar, Muhammad Sajjad "Protein Engineering Methods And Applications: Case Study of Alpha-amylase from Hyperthermophilic Archaeon, *Methanocaldococcus jannaschii* For Improved Activity" for Oral Presentation in the 2nd International Conference on Emerging Horizons in Science and Technology 21-22 November, 2024 (ICEHST-2024).

General scientific articles/publications

1. Akhtar, M. Waheed, (2004) strenghthening Research and Development in our Institutions. Conference on Higher Education in Pakistan, LUMS/World Bank, Lahore.
2. Akhtar, M. Waheed, (2001) Raising quality of teaching and research. Conference on Redifining Higher Education in Pakistan, LUMS/World Bank, Lahore Feb. 5-6.
3. State of life sciences in Pakistan- a plenary talk. 6th National Conference, Pakistan Society for Biochemistry and Molecular Biology, University of Khairpur, Pakistan, April, 2001.
4. Research and development in biochemistry and molecular biology in Pakistan. 14th FAOBMB Symposium held at University of Otago, Dunedin, New Zealand, Nov. 30, 1999.
5. A publication "Degrees of Doctor of Philosophy Awarded by University of the Punjab upto 1998". June, 1999.
6. Akhtar, M. Waheed, Teaching and Research in Biochemistry and Molecular Biology- Current State in Pakistan. IUBMB-UNESCO Symposium on Biochemical Education, University of Philippines, 2-5 December 1997.
7. Akhtar, M. Waheed (1997) Writing a research proposal, Newsletter Pak. Soc. Biochem. Mol. Biol.
8. Akhtar, M. Waheed, Fifty years of the University of the Punjab (1947-1997) Academic and Scientific Aspects, Golden Jubilee Symposium, 12 August 1997.
9. Akhtar, M. Waheed (1996) Guidelines for writing synopsis for a Ph.D. research project. Proceed. Adv. Studies Res. Board. University of the Punjab, Lahore.
10. Akhtar, M. Waheed (1996) Guidelines for a written thesis for Ph.D. degree. Proceed. Adv. Studies Res. Board, University of the Punjab, Lahore.
11. Akhtar, M. Waheed, Effective learning in biological and biochemical sciences, Higher Education News, UGC, p.2, Oct. 1996.
12. Akhtar, M. Waheed, (1972) Sources of Infectious Diseases, Concepts - Geographical Society, University of Strathclyde, U.K., 107-8, 1972.
13. Akhtar, M. Waheed, Origin of life on earth in Science and Ideology (Ed. M. Anis Alam), pp.120-138, 1976.
14. Akhtar, M. Waheed, Man and Science in Aroma-magazine, Institute of Chemistry, University of the Punjab, Lahore, 1975.