

CURRICULUM VITAE

NAME

M. Waheed Akhtar, Ph.D.

CURRENT POSITIONS

Director, School of Biological Sciences,
University of the Punjab, Lahore

Professor emeritus, university of the punjab

ADDRESS

Office: School of Biological Sciences,
University of the Punjab, Lahore-54590, Pakistan.
Phones: (042) 9923 0970, 0300 410 5823
Email: mwa.sbs@pu.edu.pk

Home: 12 G, DHA-EME Housing Society, Multan Road, Lahore-53711, Pakistan.



MARITAL STATUS: Married, three children

PREVIOUS POSITIONS

Founding Director, Inst. of Biochemistry and Biotechnology, University of the Punjab, Dec. 1996-April, 2004

Dean, Faculty of Science, University of the Punjab, since July 2002-April 2004

Meritorious Professor, July, 2002 - April, 2004

Visiting Faculty, Department of Biological sciences, Forman Christian College University, Lahore.

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. Awarded to host as Chairman, Organizing Committee, 18th Symposium of the Federation of Asian and Oceanian Biochemists and Molecular Biologists, at Lahore, Pakistan during Nov. 20-23, 2005.
8. Member Advisory Panel Royal Swedish Academy of Sciences for making nomination for the award of Nobel Prize in Chemistry, 1994 and 2000.
9. Elected Honorary Fellow, Pakistan Society for biochemistry and Molecular biology, 1997.
10. British Council Award to study teaching and research in biochemistry and biotechnology in British universities and develop joint programs. Feb. 1994.
11. Senior Fulbright Research Fellowship, 1989-90.
12. Consultant United Nations Industrial Development Organisation (UNIDO), Aug.- Sept. 1988, Trinity College, Dublin, Ireland.
13. UNIDO Consultant, July-Oct. 1986, Trinity College, Dublin.
14. UNIDO Consultant, July-October 1984, Trinity College, Dublin.
15. Govt. of Pakistan Award for Ph.D. studies, University of Strathclyde, Scotland, U.K. 1970-1973.
16. First position in M.Sc. Biochemistry group, 1966

RESEARCH SUPERVISION

List of completed Ph.D. degree research supervised

The researchers listed below successfully completed their research under his supervision for 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 <i>Cellulomonas</i> 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-D) 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 <i>carum</i> 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 immobi-lized 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 <i>Mycobacterium tuberculosis</i> 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 <i>Bacillus</i> 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 <i>Mycobacterium tuberculosis</i> : recombinant expression and characterization	2015
42.	Faiza Gul	Expression and secretion of recombinant ovine somatotropin in <i>Escherichia coli</i>	2015
43.	Madiha Afzal	Recombinant production of native and multi-epitope fusion antigens of <i>Mycobacterium tuberculosis</i> 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 <i>Mycobacterium tuberculosis</i> : recombinant production and immunogenic characterization	2016
46.	Saba Ghazanfar	Identification of differentially expressed proteins in colorectal cancer	2017
47.	Aasia Khaliq	Rapid detection of infection and drug resistance in tuberculosis patients	2018
48.	Muhammad Mudassir Iqbal	Molecular cloning, sequence characterization and expression studies of human interleukin-24	2018
49.	Razia Tajwar	Protein engineering and characterization of xylanases from <i>Thermotoga maritima</i>	Thesis submitted
50.	Sahar Shahid	Effects of carbohydrate binding modules on characteristics of xylanases from thermophilic bacteria	Thesis submitted
51.	Abdul Basit	Engineering endoglucanases from <i>Thermotoga</i> sp. To improve their characteristics	Thesis submitted

List of completed M.Phil. degree research supervised

Sr. No.	Name	Title of thesis	Year awarded
1.	M.Shahzad Ali	Expression and characterization of endoglucanase celX from <i>Clostridium</i> sp.	2015
2.	Faiza Asghar	Effect of CBM2 on expression and activity of Cel5A of <i>Thermotoga maritima</i> ”	2016
3.	Faiqa Komal	Effect of CBM-3 fusion at C-terminal on expression and activity of <i>Clostridium thermocellum</i> CelB	2016
4.	Iqra Jabbar	Effect of CBM3 on expression and activity of Cel5A of <i>Thermotoga maritima</i>	2016

5.	Saadia Israr	Cloning & expression of cel 12b of <i>Thermoliga neapolitana</i>	2016
6.	Tayyaba Rubab	Directed evolution of endoglucanase celA-CD of <i>Clostridium thermocellum</i>	2017
7.	Khadija Waqar	Effect of linker length and dockerin on the catalytic activity of endoglucanase E. from <i>Clostridium thermocellum</i>	2017
8.	Faiza Asghar (ii)	Solubilization of cel12B of <i>Thermotoga neapolitana</i> in fusion with SUMO	2017
9.	Farhana Ibrahim	Construction of fusion molecule from celA and BglA of <i>Clostridium thermocellum</i>	2017
10.	Saba Fatima	“Construction of fusion molecule from CelA and BglA of <i>Clostridium thermocellum</i> ”	2017
11.	Farah Deeba	Effect of CMB3 fusion at N-terminal on expression and activity of <i>Clostridium thermocellum</i> celB.	2017
12.	Aneeqa Iqbal	”Effect of CBM6 on the Activity of Xylanase XynA of <i>Thermotoga maritima</i> ”	2017
13.	Anum Shafiq	“Effect of positioning of CBM3c on the activity of Cel9R of <i>Clostridium thermocellum</i> ”	2017

Supervised over one hundred students in their research done in partial fulfillment of the requirements for their M. Sc. degrees over the years.

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

Sr. No.	Name of Researcher	Status	Research Area
1.	Abdul Basit	Ph.D. (2015)	Fusion cellulolytic enzymes Engineering cellulases
2.	Fatima	Ph.D. (2015)	
3.	Mohsina Akhtar	Ph.D. researcher	Human serum protein markers in tuberculosis
4.	Sadaf Sulman	Ph.D. researcher	
5.	Chandni Yaqoob	Ph.D. researcher	
6.	Shaista Khaliq	Ph.D. researcher	
7.	Nasir	Ph.D. researcher	
8.	Tahira Batool	Ph.D. 2012	Biomarkers in cancer
9.	Shahzadi Naureen	Ph.D. 2013	
10.	Safa Akhtar	Ph.D. 2013	
11.	Madiha	Ph.D. (2016)	

CURRENT RESEARCH INTERESTS

1. 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.
2. Expression studies of eukaryotic proteins including growth hormones and cytokines in *Escherichia coli*, *Bacillus subtilis* and *Pichia pastoris*.
3. Genetic resistance markers for MDR-TB and designing and production of multi-epitope proteins for use in diagnosis and therapy of TB.
4. Characterization of protein markers for early diagnosis of some forms of cancer.

COLLABORATING INSTITUTIONS

Foreign Institutions

- 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 Project	Durati on	Position/ Nature of grant	Funding Agency
1	Production and characterization of enzymes of commercial importance	1978 - 1981	Co-Principal Investigator- Research Project	Pakistan Science Foundation, Islamabad
2	Bioconversion of lignocellulosic substrates	1984 - 1987	Principal Investigator - Research Project	Pakistan Atomic Energy Commission, Islamabad
3	Study of cellulase genes of <i>C. flavigena</i>	1984, 1986 and 1988	Consultant Researcher- Research Project	UNIDO, Vienna / Trinity College, Dublin
4	Bioconversion of cellulosic materials by cellulolytic microorganisms	1985 - 1990	Principal Investigator - Research Project	International Foundation for Science, Sweden
5	Studies of cellulase gene of Bacillus CT1	July - Oct. 1987	Visiting Scientist Research Project	Cornell University, Ithaca, USA
6	Expression and characterization of cellulase genes	Dec. 1989 - Dec. 1990	Visiting Professor- Research project	Fulbright Fellowship/ Cornell Univ. USA
7	Characterisation and improvement of locally isolated cellulolytic organisms	1991 - 1994	Principal Investigator - Research Project	NSRDB, Islamabad
8	Characterisation and applications of newly isolated thermophiles and extreme thermophiles	1993 - 1995	Principal Investigator - Research Project	ISESCO, Rabat, Morocco
9	Development of a thermostable cellulase system for the bioconversion of lignocellulosic biomass	1994 - 1997	Principal Investigator - Research Project	Pakistan Science Foundation, Islamabad
10	Relationship between biochemical parameters and pathological state in cardiovascular disease	1997 - 1999	Principal Investigator - Research Project	Punjab University
11	Characterisation and applications of bioregulators of economic importance	2003 - 2007	Project Director	Higher Education Commission
12	Development of immunoassays for glycosylated 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 Sciences 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	2010 - 2013	Principal Investigator	Pakistan Academy of Sciences

	applications			
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 Science and Technology Cooperation Program 2009
25.	Characterization and application of lytic polysaccharide mono-oxygenases	2016-2019	Co-Principal Investigator	HEC, Pakistan
26.	Designing fusion antigens for diagnostic and prophylactic applications in tuberculosis	2018-2020	Principal Investigator	Pakistan Academy of Sciences
27.	Role of antifungal bacterial proteins in managing early blight disease of tomato	2018-2020	Co-Principal Investigator	HEC (under process)

**PCIs 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.	Strengthening 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
17. Member, Chemical Society of Pakistan
18. Member, Advanced Studies and Research Board, Univ. of the Punjab, Lahore, 1995-98
19. Member, Board of Study Biological Sciences, Quaid e Azam University, Islamabad, 1994-97
20. Member, Board of Studies, Institute of Biochemistry, University of Baluchistan, Quetta
21. Chairman, Punjab University Research Committee, Univ. of the Punjab, 1996 to date
22. Chairman, Affiliation Committee, University of the Punjab, Lahore, 1998-2000
23. Member, Selection Board, HEJ Research Institute of Chemistry, University of Karachi, Karachi
24. Coordinator, PU-PARC Joint Committee for Life Sciences Research Center, Punjab University
25. Chairman, Committee for Hons. Degree Programs, University of the Punjab
26. Chairman, Punjab University Academic and Co-Curricular Committee
27. Member, University Campus Committee, University of the Punjab
28. 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, administered 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, Australasia 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
- Chairman, Organising 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
- Organiser, international symposium “Working with Proteins in Post-genomic Era” School of Biological Sciences, University of the Punjab, 6-7 January, 2010.
- Organised 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, Organising 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, Phillipines, 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.
- Participated 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 presented 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, Muhammad 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 application " Fusion of tnpst1 with hsp_x contributes to soluble expression and improved sensitivity"

Pakistan Patent Application No. 324/2014; Filing date: 15 April, 2014
Applicant: School of Biological Sciences, University of the Punjab, Lahore
Authors: M. Waheed Akhtar, Ruqyya Khalid, Madeeha Afzal and Sana Khurshid

4. Patent Application “New personal care product and method of its production”
Pakistan Patent application No. 923/2014; Filing date Dec.31, 2014
Applicant: School of Biological Sciences, University of the Punjab, Lahore
Authors: M. Waheed Akhtar, Saima Sadaf, Abdul Basit
5. Patent application “Truncation and CBM engineering of CelZ.C of *Thermotoga Sp.* for improved biomass degradation” Pakistan Patent Application No. 693/2015; filing date October 29, 2015
Applicant: School of Biological Sciences, University of the Punjab, Lahore
Authors: M. Waheed Akhtar, Saima Sadaf, Abdul Basit
6. Patent application “Recombinant thermostable endoglucanase (CelX) from *Clostridium Sp.* showing higher cellulolytic activity” degradation” Pakistan Patent Application No. 694/2015; filing date October 29, 2015
Applicant: School of Biological Sciences, University of the Punjab, Lahore
Authors: M. Waheed Akhtar, Saima Sadaf, Shahzad Ali

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. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. Faizur-Rahman, M., Akhtar, W., Shahid, M. (1982) Technitium-99m-Sn-monomercapto-succinic acid (MMSA): A potential radiopharmaceutical for renal studies. J. Nuclear Medicine 23 (5), 72.
23. 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.
24. Akhtar, M. Waheed, M. N. Nawazish and Naheed Kausar (1982) Lipids mobilisation during germination of *Cucumis melo* seeds. Pak. J. Biochem. 15, 77.
25. 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.
26. 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.
27. 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.
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30. 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.
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32. 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.
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34. 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.
35. 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.

36. 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.
37. Zaka, S., Akhtar, M. W., Khan, S. A. and Bhatti, M. K. (1986) Characterization of the cassia seed oil by oxidative degradation. Proc. Pak. Acad. Sci. 23, 167-172.
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39. 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.
40. 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.
41. 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.
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43. 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.
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46. 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.
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50. Sami, A. J, and Akhtar, M. W. (1989) Purification and characterisation of three extracellular CMCases of *C. flavigena*, Biochem. Soc. Transc. (London) 18, 651.
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52. Zaka, Shaheena, Akhtar, M. W. and Khan A. Shafiq (1989) Lipid metabolism in germination seeds of Cassia, Pak. J. Sci. Ind. Res. 32, 323.
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54. Aman, T., and Akhtar, M. W. (1991) Isolation and characterisation of Zea mays (Neelum) phospholipase. Sci. Int. (Lahore) 3(1), 61-64.
55. 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.
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59. 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.
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61. 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.
62. 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.
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93. 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.
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106. 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.
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111. 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.
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128. 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.
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132. 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.
133. Saima Sadaf, M.Waheed Akhtar and Zarina Iqbal (2012) Uncertainty over pharmaceutical and biotech product patents in Pakistan. *Nature Biotechnology* 30, 1198-1200.
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140. 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.
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142. 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.
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144. 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.
145. 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.
146. 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.
147. 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.
148. 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.
149. 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.
150. 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.
151. 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.
152. 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.
153. Iram Fatima, Saima Sadaf, Syed Ghulam Musharraf, Naghma Hashmi and Muhammad Waheed Akhtar (2017) CD5 molecule-like and transthyretin as putative biomarkers of chronic myeloid leukemia - an insight from proteomic analysis of human plasma. Scientific Reports | 7:40943 | DOI: 10.1038/srep40943.
154. Aasia Khaliq, Resmi Ravindran, Syed Fahadulla Hussainy, Viswanathan V. Krishnan, Atiq 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>

155. 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.
156. 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>
157. 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.
158. 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.
159. 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. <https://doi.org/10.1002/bit.26602>
160. Abdul Basit, Saima Sadaf, M. Waheed Akhtar (2018) Health improvement of human hair and their reshaping using recombinant keratin K31. (Submitted J. Cosmetic Science)

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) strengthening 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 glycosylated 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 International 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 York, USA, on 5 Oct. 2011.
33. Trends in TB diagnostics. Invited talk, International Symposium ‘Tuberculosis – Epidemiology, Diagnostics and Therapeutics’ 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.

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 McConnell, 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.
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