

CURRICULUM VITAE

Dr. A.R. Shakoori

Tamgha-i-Imtiaz, Aizaz-i-Kamal, ECO Laureate

Fellow, The World Academy of Sciences (TWAS)

Fellow, Pakistan Academy of Sciences

Meritorious Professor

Former Professor, U Mass Medical School, Worcester, MA, USA

Visiting Professor, King Saud University, Riyadh, KSA

President, Zoological Society of Pakistan

Professor Emeritus
Distinguished National Professor & Director
School of Biological Sciences
University of the Punjab
Lahore

| CONTENTS | Page |
|---|------|
| 1-9. General Information | 1 |
| 10. Academic Qualifications | 1 |
| 11. Honours Awarded | 2 |
| 12. Research Experience | 3 |
| A-B) Sponsored Research Projects | 3 |
| C) Ph.D. Research Projects | 6 |
| 13. Employment Record | 8 |
| 14. Post-Doctoral Fellowship | 8 |
| 15. Countries Visited | 9 |
| 16. Language Proficiency | 9 |
| 17. Membership of Research Societies and other activities in and outside the country | |
| A) Membership of Societies | 10 |
| B) Member, Editorial Committees | 10 |
| C) Member, Administrative and Examining bodies | 11 |
| D) Administrative Experience | 11 |
| E) Invited Lectures | 12 |
| F) Television/Radio Programmes | 13 |
| G) Congress/Conference attended/organized | 13 |
| H) Contributions towards curriculum development | 15 |
| I) Compilation of books | 16 |
| 18. Referees | 17 |
| 19. List of Publications | |
| A) Research papers (575) | 19 |
| B) Technical Reports (19) | 43 |
| C) Theses written by me (2) | 43 |
| D) Theses written under my supervision (235) | 43 |
| E) List of Abstracts (639) | 43 |
| F) Popular articles (10) | 65 |
| G) Books (23) | 65 |
| 20. Referee/Reviewer of International Journals | 66 |

BIO - DATA**Dr. Abdul Rauf Shakoori**

Tamgha-i-Imtiaz, Aizaz-i-Kamal, ECO Laureate

[\(http://www.pu.edu.pk/arshakoori/\)](http://www.pu.edu.pk/arshakoori/)[\(http://www.umassmed.edu/cellbio/faculty/\)](http://www.umassmed.edu/cellbio/faculty/)

1. **NAME** DR. ABDUL RAUF SHAKOORI
2. **PLACE AND DATE OF BIRTH** SIALKOT (PAKISTAN); OCTOBER 1, 1942.
3. **NATIONALITY NATIONAL ID CARD NO** PAKISTANI; 35202-2387973-7
4. **MARITAL STATUS** MARRIED, 5 CHILDREN.
5. **PRESENT POSITION** **Professor Emeritus,**
Distinguished National Professor & Director ,
School of Biological Sciences, University of the Punjab
Professor of Cell Biology, University of
Massachusetts Medical School, Worcester, MA, USA.
Visiting Professor, Lahore University of Management
Sciences
6. **QUALIFICATIONS** M.Sc. (Punjab), D.Sc. (Stuttgart)
7. **FIELD OF SPECIALIZATION** Cell Biology/Molecular Biology/Toxicology.
Environmental Biotechnology
8. **FIELD OF RESEARCH ACTIVITIES** Molecular Biology/Cell Biology (Gene Expression),
Biochemical Toxicology (Pesticide Biochemistry &
Physiology), Aquatic Toxicology, Environmental
Biotechnology.
9. **ADDRESS FOR COMMUNICATION** School of Biological Sciences, University of the Punjab,
New Campus, Lahore 54590, Pakistan.
10. **ACADEMIC QUALIFICATIONS**

| Sr. No. | Institutions attended (with dates) | Degrees obtained in | Division | Subjects Studied |
|---------|--|---|----------|---|
| 1. | Dennys High School, Rawalpindi, Pakistan (1950-1956) | Matriculation (1956) | First | Mathematics, Chemistry, Physics, |
| 2. | Dyal Singh College, Lahore, Pakistan (1956-1958) | Intermediate (Science) Examination (1958) | Second | Biology, Chemistry, Physics. |
| 3. | University of the Punjab, Lahore. (Government College, Lahore) (1958-1960) | Bachelor of Science (1960) | Second | Zoology, Chemistry. |
| 4. | University of the Punjab, Lahore (Govt. College, Lahore) (1960-62) | Master of Science (1962) | First | Zoology |
| 5. | Goethe Institute, Lahore, Pakistan (1967-1968) | Diploma in German Language (1968) | Second | German |
| 6. | University of Hohenheim, Institut fur Biologische Chemie und Ernährungswissenschaft, Stuttgart, West Germany (1969-1972) | D.Sc. (Dr. rer. nat.) (1972) | First | Cell Biology, Biochemistry Animal Physiology |

11. HONOURS AWARDED

- 1) Awarded **ROLL OF HONOUR**, Government College, Lahore for obtaining first class (M.Sc.) in **1962**.
- 2) I was awarded a **CASH PRIZE of Rs. 5,000/-** for doing research work of exceptional merit in **1979**, by the University of the Punjab. The research work that I submitted for this award was done in Pakistan and was recommended for award after scrutiny by American referees.
- 3) I was awarded another **CASH PRIZE of Rs. 7,000/-** for doing research work of exceptional merit in **1983** by the University of the Punjab. The research work that I submitted for this award was done in Pakistan and was recommended for award by British and American Referees.
- 4) **COMMENDATION CERTIFICATE and CASH PRIZE of Rs. 15,000/-** was awarded by National Book Foundation of Pakistan of Ministry of Education, Govt. of Pakistan in July, **1988**. This award was given on the basis of research publications of 1986.
- 5) **SENIOR FULBRIGHT FELLOWSHIP 1992, 1993.**
- 6) **FELLOW, PAKISTAN ACADEMY OF SCIENCES (1991-Continuing).**
- 7) **ACTIVE MEMBER, THE NEW YORK ACADEMY OF SCIENCES (1993, 1994).**
- 8) **SENIOR FELLOWSHIP OF Deutsche Akademischer Austausch Dienst, 1996.**
- 9) Awarded a **COMMENDATION CERTIFICATE and 1st Prize** (cash prize of Rs. 25,000) by National Book Foundation of Pakistan, **Ministry of Education** in **1997** for publishing research papers in Foreign Journals of repute.
- 10) **AWARD OF HONOUR** in recognition of Outstanding Services for the promotion of Zoological Sciences by the Zoological Society of Pakistan and Pakistan Agricultural Research Council in **1995**.
- 11) **ZOOLOGIST OF THE YEAR AWARD**, given by Zoological Society of Pakistan, **1996**.
- 12) **PRESIDENT OF PAKISTAN'S HIGHEST ACADEMIC AWARD AIZAZ-I-KAMAL, 1996.**
- 13) **OUTSTANDING ZOOLOGIST AWARD OF HONOUR** in recognition of Outstanding Contributions in Zoological Sciences by the Zoological Society of Pakistan in **1997**.
- 14) **ROYAL SOCIETY OF UNITED KINGDOM FELLOWSHIP, 1998.**
- 15) **TAMGHA-I-IMTIAZ**, Civil Award of **Government of Pakistan** announced on August 14, 1999 and conferred on **March 23, 2000**.
- 16) **RESEARCH PRODUCTIVITY ALLOWANCE** of Ministry of Science & Technology **2002, 2003, 2004, 2005, 2006, 2007, 2008, 2010, 2012, 2013**
- 17) Rated **SEVENTH amongst Biologists of Pakistan** with cumulative **Impact Factor 36.821** during **1999**. (Reference: *Leading Scientists of Pakistan*, Published by the Pakistan Council of Science and Technology, Islamabad, 1999).
- 18) Placed at **POSITION 15** with a total of **44 citations and Cumulative Impact Factor of 72.549** during 2000. (Reference: *Scientific Research in Pakistan*, Published by the Pakistan Council of Science and Technology, Islamabad, 2000).
- 19) Placed at **SECOND POSITION amongst the TOP TEN BIOLOGISTS in the country (Total Points: 1226)**. Also **HEADED the list of TOP TEN ZOOLOGISTS IN THE COUNTRY**. (Reference: *Productive Scientists of Pakistan*, Published by the Pakistan Council of Science and Technology, Islamabad, 2004).
- 20) Placed at **FOURTH POSITION amongst the TOP TEN BIOLOGISTS in the country (Total Points: 1306)**. Also **HEADED the list of TOP TEN ZOOLOGISTS IN THE COUNTRY**. (Reference: *Productive Scientists of Pakistan*, Published by the Pakistan Council of Science and Technology, Islamabad, 2005)
- 21) **Fellow, Academy of Sciences for the Developing World (Third World Academy of Sciences) (2004-ongoing)**
- 22) **Distinguished National Professor, Higher Education Commission (2005-ongoing)**
- 23) **Professor Emeritus, University of the Punjab, Lahore (2010-)**
- 24) **Distinguished Scientist of the Year 2011, awarded by Pakistan Academy of Sciences.**
- 25) **Rated at position # 1 amongst Zoologists of the Country in 2011. Also rated amongst the top Five Biologists of the Country by PCST in 2011.** (Reference: *Productive Scientists of Pakistan*, Published by the Pakistan Council of Science and Technology, Islamabad, 2011).
- 26) **Awarded ECO Award 2012 in the field of Science and Technology by Economic Cooperation Organization during Summit Meeting in Baku, Azerbaijan on October 16, 2012.**
- 27) **Rated the Top Most Productive Scientist in Biological Sciences 2013 by PCST. Also rated at number three among the ten top most productive scientists of Pakistan 2013.**

12. RESEARCH EXPERIENCE:

A) RESEARCH PROJECTS SPONSORED BY GOVERNMENT OF PAKISTAN/DEUTSCHE FORSCHUNGSGEMEINSCHAFT, USAID, FULBRIGHT FOUNDATION AND UNIVERSITY OF THE PUNJAB.

| No. | Research Projects | Institution | Duration |
|-----|---|--|--------------------------|
| 1. | Development of isolation techniques for nuclei and nucleoli. Studies on the ultrastructure, nucleic acids, protein, glycolytic enzymes, inorganic ions etc of nuclei and nucleoli isolated in non-aqueous media. | Institute for Biological Chemistry & Nutrition, University of Hohenheim, Stuttgart, West Germany. | 1969-1972 |
| 2. | Non-aqueous isolation of nucleoli with zonal rotors. (under supervision of Prof. Dr. Gunther Siebert) | Same as above | June, 1972 Dec., 1972 |
| 3. | Several projects relating to the effects of carcinogens (thioacetamide), insecticides (OP & OC) and narcotics on the histological and biochemical components of various tissues of different vertebrates are in progress. | Department of Zoology, University of the Punjab, Lahore and NIAB, Faisalabad. | 1973-2000 |
| 4. | Extrahepatic biliary cirrhosis - histological studies. | Department of Zoology, Univ. Punjab, & PGMI, Lahore. | 1975-1977 |
| 5. | Electron microscopical studies on thyrotrophs after chemical thyroidectomy in rats. | Same as above | 1975-1977 |
| 6. | Effect of thioacetamide on the development of housefly and other drosophilid flies: morphological and biochemical studies. | Department of Zoology, University of the Punjab, Lahore. | 1977-1980 |
| 7. | Biochemical, haematological and histological effects of starvation and refeeding on the liver and blood of rabbits. | Same as above | 1980-1986 |
| 8. | Heterotopic transplantation of entire muscles in mammals (in collaboration with Dr. S.A. Mufti, College of Osteopathic Medicine, Ohio University, Athens, Ohio, USA). | Same as above | 1977-1985 |
| 9. | Effect of OC, OP and synthetic pyrethroids on the liver function tests of different mammals. | Same as above | 1980- continuing |
| 10. | Effect of partial hepatectomy on serum and liver chemistry; Regeneration of liver under the influence of hepatotoxins, hepatocarcinogens, anabolic steroids and heavy metals. | Same as above | 1980-1987 |
| 11. | Biochemical and histological effects of chlorinated insecticides on rats-long term feeding experiments. | Same as above | 1980-1990 |
| 12. | Biochemical toxicology of synthetic pyrethroids in Pakistan. | Same as above | 1982-Cont. |
| 13. | Screening of local bacterial flora and isolation of plasmid DNA collaboration with Dr. A.R. Bhatti, Aerobiology Division, National Research Council, Canada . | Centre for Advanced Molecular Biology, University of the Punjab | 1983-1985 (in |
| 14. | Mechanism of DNA repair after chemically induced damage to DNA in <i>Micrococcus luteus</i> and <i>E. coli</i> (in collaboration with Dr. S. Riazuddin, of CAMB, Lahore). | Same as above | 1983-1986 |
| 15. | Isolation and characterization of strains of <i>M. luteus</i> resistant and sensitive to various alkylating agents (in collaboration with Dr. S. Riazuddin, NIAB, Faisalabad). | Centre for Advanced Molecular Biology, University of the Punjab, Lahore. | 1983-1985 |
| 16. | Mechanism of action of thioacetamide, hepatocarcinogen. Binding with various nucleosides: spectrophotometric and electrophoretic studies (in collaboration with Dr. M. Salih Ahmad, NIAB, Faisalabad, Pakistan). | Same as above | 1983-1988 |
| 17. | Enzymatic changes in the liver of developing chicks after treatment with synthetic pyrethroids (in collaboration with Dr. Shamshad H. Gilani, New Jersey University of Medicine and Dentistry, New Ark, New Jersey, USA). | Department of Zoology, University of the Punjab | 1984-1996 |
| 18. | Screening of local bacterial flora for search for new restriction-endonucleases (in collaboration with Dr. S. Riazuddin, CAMB, University of the Punjab). | Same as above | 1984-1988 |
| 19. | Effect of heavy metals on the induction of drug metabolizing enzyme in mammals (in collaboration with Prof. Dr. W. Gorrod , | Department of Zoology, University of the Punjab and Department | 1985-1991 |

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| 20. | Department of Pharmacy, King's College, London). Effect of aflatoxin on the poultry production (Biochemical toxicology) | Of Pharmacy, King's College, London. Veterinary College, Lahore and University of the Punjab, Lahore | 1985- 1990 |
| 21. | Kinetics of Inhibition of acetylcholinesterase by organo-phosphate insecticides (In collaboration with Dr. F.H. Shah) | PCSIR Laboratories, Lahore and University of the Punjab | 1984-1988 |
| 22. | Role of heat shock proteins in differentiation of HL60 Cells and osteoblasts (In collaboration with Drs. G. Stein and J. Stein, U Mass Medical Centre, Worcester, USA). | U Mass Medical Centre, Worcester, Massachusetts, USA. | 1989-1990 |
| 23. | Role of osteocalcin gene expression in differentiation of rat osteoblasts (In collaboration with Drs. G. Stein and J. Stein). | Same as above | 1989- Continuing |
| 24. | Etiology of hydropericardium syndrome in poultry | Department of Zoology, University of the Punjab. | 1989-1990 |
| 25. | Metabolism of synthetic pyrethroids: Role of esterases | Same as above | 1990-Cont. |
| 26. | Effect of pesticides on growth of <i>Bacillus thuringiensis</i> and its toxicity in insects. | Same as above | 1990-2000 |
| 27. | Analysis and characterization of heat shock proteins in <i>Bacillus thuringiensis</i> . | Same as above | 1990-1995 |
| 28. | Specificity of <i>Bacillus thuringiensis</i> toxicity to insects other than Coleoptera and Lepidoptera | Same as above | 1990-1995 |
| 29. | Biochemical toxicity of pesticides and heavy metals to fresh water fish. | Same as above | 1991- Continuing |
| 30. | Mechanism of plasmid mediated antibiotic resistance in gram negative bacteria. | Same as above | 1991- 1995 |
| 31. | Tissue specific regulatory elements in promoter of osteocalcin gene (In collaboration with Drs. G. Stein, J. Stein and J. Lian of U Mass Medical Centre, Worcester, MA, USA) | U Mass Medical Centre, Worcester MA, USA & Department of Zoology, University of the Punjab. | 1991- 1997 |
| 32. | Vitamin D and Glucocorticoid regulated expression of Osteocalcin gene (In collaboration with Drs. G. Stein, J. Stein and J. Lian of U Mass Medical Centre, Worcester, MA, USA) | Same as above | 1992- 1997 |
| 33. | Mutational analysis of cell cycle regulating H4 histone gene (In collaboration with Drs. G. Stein, J. Stein and J. Lian of U Mass Medical Centre, Worcester, MA, USA). | Same as above | 1992- 1997 |
| 34. | Isolation and characterization of bacteria from different polluted areas of Pakistan with an object to search for microorganisms which could detoxicate various pollutants (in collaboration with National Agricultural Research Centre, Islamabad). | Department of Zoology University of the Punjab Lahore. | 1994- 2002 |
| 35. | Cell cycle regulated expression of histone gene H4 through site II of Promoter in FDCP1 haematopoietic stem cell line. (in collaboration with Drs. G. Stein, J. Stein and J. Lian) | Department of Cell Biology, U Mass Medical Centre, Worcester, MA, USA. | July 1994- 1999 |
| 36. | Regulation of cyclin D1 promoter in human culture mammary gland cells (in collaboration with Drs. M. Beato and M. Truss) | Institute fur Molekularbiologie und Tumorforschung, Universitat Marburg, Germany. | June 1996- 2000 |
| 37. | AML as transcriptional regulator and osteoblast differentiation mediator (In collaboration with Drs. G. Stein, J. Stein and J. Lian of U Mass Medical Centre, Worcester, MA, USA). | Department of Zoology University of the Punjab, Lahore & U Mass Medical Centre, Worcester, MA, USA. | 1996- 2002 |
| 38. | Molecular analysis of cbfa1 promoter (In collaboration with Drs. G. Stein, J. Stein and J. Lian of U Mass Medical Centre, Worcester, MA, USA). | Same as above | 1998- 2001 |
| 39. | Metabolism of nicotine in liver, kidney and brain (in collaboration with Dr. J.W. Gorrod , Department of Biological Sciences, University of Essex, Colchester, UK). | Toxicology Unit, Department of Biological Sciences, University of Essex, Colchester, U.K. | 1999- 2001 |
| 40. | Incidence of Breast Cancer in Pakistani Female Population (in collaboration with Dr. Faisal Sultan, Medical Director) | Shaukat Khanum Memorial Cancer Hospital & Research Centre | 2002 2007 |
| 41. | Search sand molecular characterization of new biopesticides, (in collaboration with Prof. M. Akhtar) | School of Biological Sciences, University of the Punjab, Lahore | 2003- 2007 |
| 42. | Molecular meachanism of remediation of toxicant from the environment (in collaboration with Prof. M. Akhtar) | School of Biological Sciences, University of the Punjab, Lahore | 2003- 2007 |

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| 43. | Cloning of hepatitis B virus pre S region and its expression in <i>E. coli</i> . (in collaboration with Prof. M. Akhtar) | School of Biological Sciences, University of the Punjab, Lahore | 2003-2007 |
| 44. | Microbial degradation of pesticides | School of Biological Sciences, University of the Punjab, Lahore | 2003-2008 |
| 45. | Frequency of p53, K-RAS mutations and microsatellite instability in uterine endometrial carcinoma in Pakistani women | School of Biological Sciences, University of the Punjab, Lahore | 2004-2012 |
| 46. | Incidence of cervical carcinoma and loss of heterogeneity on chromosome 17 in Pakistani women | School of Biological Sciences, University of the Punjab, Lahore | 2004-2013 |
| 47. | Role of CBFA1 in mediating osteoblast growth and differentiation (in collaboration with Prof. G. Stein of U Mass Medical Centre, Worcester, MA, USA) | School of Biological Sciences, University of the Punjab and U Mass Medical Center, Worcester, MA, USA (under Pak-US Co-operation in Science & Technology) | 2005-2007 |

B) RESEARCH PROJECTS SPONSORED BY PAKISTAN SCIENCE FOUNDATION, UNIVERSITY GRANTS COMMISSION OF PAKISTAN, PAKISTAN ATOMIC ENERGY COMMISSION AND PAKISTAN AGRICULTURAL RESEARCH COUNCIL.

| No. | Name of the Project | Sponsored | My Association as |
|-----|---|---|-------------------------------|
| 48. | Heterotopic transplantation of entire muscles in mammals. | Pakistan Science Foundation Rs.300,000/- (1977-1979) | Co-Principal Investigator |
| 49. | Morphological and metabolic hazards of chlorinated insecticides on small mammals in Pakistan. | Pakistan Science Foundation. Rs. 231,518/- (1980-1983) | Principal Investigator |
| 50. | Toxicology of cadmium and lead in common edible fish of Pakistan, <i>Cirrhina mrigala</i> | Pakistan Science Foundation. Rs. 450,000/- (1985-1988) | Principal Investigator |
| 51. | Purification of enzymes required in research in Genetic Engineering and Recombinant DNA Technology (in collaboration with Dr. S. Riazuddin, NIAB, Faisalabad). | Pakistan Atomic Energy Commission Rs. 660,000/- (1983-1986) | Co- Principal Investigator |
| 52. | Biochemical effects of synthetic pyrethroids against <i>Tribolium castaneum</i> | University Grants Commission of Pakistan, Rs. 99,700/- (1986). | Principal Investigator |
| 53. | Pyrethroid induced macromolecular abnormalities and their effects on growth in Chicks | NSRDB-UGC (Rs. 453,500/-) (1990-1993) | Principal Investigator |
| 54. | Electrophoretic studies on esterases of <i>Tribolium castaneum</i> : a correlation with insecticide resistance | University Grants Commission of (Rs. 68,000) (1991). | Principal Investigator |
| 55. | Survey of insecticide degrading bacteria from soil samples | Pakistan Agricultural Research Council (Rs. 40,000) (1995) | Principal Investigator |
| 56. | Survey of microbial fauna of sodic-saline soil/water of Punjab and its evaluation for treatment of soil/water. | Pakistan Agricultural Research Council (Rs. 65,000) (1995) | Principal Investigator |
| 57. | Studies on recycling and detoxification of rural and urban domestic wastes in Punjab | Pakistan Agricultural Research Council (Rs. 45,000) (1995) | Principal Investigator |
| 58. | Studies on microbial fauna of industrial wastes with an object to assess their ability to detoxify heavy metals (lead, cadmium) | Pakistan Agricultural Research Council (Rs. 35,000) (1995) | Principal Investigator |
| 59. | Survey of hydrocarbon degrading bacteria with an object to propose solution to marine pollution due to oil over spills and cleanup of sewage sludge. | Pakistan Agricultural Research Council (Rs. 40,000) (1995) | Principal Investigator |
| 60. | Assessment of physiological and genetic defects in human population exposed to industrial effluents in the industrial area of District Kasur, Punjab, Pakistan. | Pakistan Science Foundation (Rs. 237,232) (1996-1998) | Principal Investigator |
| 61. | Bioremediation of industrial waste | University of the Punjab (Rs. 200,000) | Principle Investigator |
| 62. | Amino acid producing bacteria. | Pakistan Atomic Energy Commission (Rs. 100,000/-) (1998-1999) | Principal Investigator |
| 63. | Role of CBFA1 in mediating osteoblast growth and differentiation (in collaboration with Prof. G. Stein of U Mass Medical School, Worcester, MA, USA) | US\$120,000 provided by HEC under USA (under Pak-US Co-operation in Science & Technology)(2005-2006) | Principal Investigator |
| 64. | Structural and mechanistic studies of merozoite surface protein (MSP-1) for preparation of recombinant MSP-1 malaria Vaccine - Experimental Studies | US \$ 10,000 provided by WHO-EMRO ISESCO program for collaborative research with Prof. Nasir ud Din (Lahore) and Dr. Zahra Zamani of Pasteur Institute of Iran, Tehran. (2006-2007) | Co-Principal Investigator |

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|-----|--|---|---------------------------|
| 65. | Role of pest's cellulases in crop destruction. | Rs. 1.624 million provided by HEC, Islamabad for 3 years (2006-2009) in Collaboration with Dr. Amtul Jamil Sami, IBB, PU, Lahore (2006-2009) | Co-Principal Investigator |
| 66. | Collaborative project on genetic variants of different stage specific antigen proteins can provide diverse glycosylation substrates acting as antigenicity determinant for vaccine against malaria – Cloning Studies | US \$ 15,000 provided by WHO-EMRO ISESCO program for collaborative research with Prof. Nasir ud Din (Lahore) and Dr. Zahra Zamani of Pasteur Institute of Iran, Tehran. (2007-2009) | Co-Principal Investigator |
| 67. | Expression and characterization of metallothionein protein: multifunctionality of proteins and post translational modification of carboxyl group in proteins. | Rs. 2,994,000 were provided by HEC-PAS for collaborative research with Prof. Nasir ud Din (Lahore) (2008-2009) | Principal Investigator |
| 68. | Osteogenic potential of a local herb <i>Cissus quadrangularis</i> : Development of potential Drug for Osteoporosis | Rs. 2.499 million provided by Pakistan Academy of Sciences- Higher Education Commission (2016-2019) | Principal Investigator |

C) Ph.D. RESEARCH PROJECTS

| No. | Title of Ph.D. Thesis | Degree Awarded on |
|-----|---|-------------------|
| i) | ALREADY COMPLETED | |
| 1. | Akbar Ali Cheema: Studies on inhibition of acetylcholinesterases of vertebrates by organo-phosphorous insecticides. | 1988 |
| 2. | Najamunnisa: Studies on autotransplantation of entire muscles in mammals. | 1990 |
| 3. | Syed Shahid Ali: Morphological and biochemical hazards caused by some organochlorinated insecticides on blood and liver of rat. | 1990 |
| 4. | Syed Ata ur Rehman Rizvi: Effects of aflatoxin in poultry. | 1990 |
| 5. | Mushtaq A. Saleem: Toxicological studies on synthetic pyrethroids against red flour beetle, <i>Tribolium castaneum</i> (Herbst.) (Coleoptera: Tenebrionidae). | 1990 |
| 6. | Farah Anjum: Effects of heavy metals on drug metabolizing enzymes in rabbits. | 1992 |
| 7. | Naveeda Tufail: Toxicological effects of synthetic pyrethroids on red flour beetle, <i>Tribolium castaneum</i> (Herbst.) | 1993 |
| 8. | Riazul Haq: Studies on the growth and genome organization of <i>Thiobacillus ferrooxidans</i> . | 1996 |
| 9. | M. Amin Shaikh: Epidemiology of haemorrhagic septicaemia in Buffaloes. | 1996 |
| 10. | Neelum Moizuddin: Solar induced skin damage and protective effect of anti-oxidants in hairless mice and human volunteers | 1997 |
| 11. | Sajida Rehman: Studies on the regulation of tissue specific expression of osteocalcin gene in cultured bone cells. | 1997 |
| 12. | Farah Aziz: Mutational analysis of the cell cycle element regulating histone H4 transcription <i>in vivo</i> . | 1997 |
| 13. | Fauzia Aslam: Structural and functional analysis of glucocorticoid responsive elements in osteocalcin gene promoter. | 1997 |
| 14. | Firdous Kazmi: Biochemical and toxicological effects of organophosphates insecticides in rat | 1997 |
| 15. | M. Hamid Rashid: Purification and characterization of native proteolytically nicked and chemically modified beta glucosidase from <i>Aspergillus niger</i> | 1998 |
| 16. | M. Zafar Iqbal: Effect of aflatoxicosis on muscle, fat, bone growth and its possible reversal by nandrolone decanoate. | 1998 |
| 17. | M. Ashraf Mirza: Immune responses against bacterial invasion in <i>Labeo rohita</i> (Hamilton). | 2002 |
| 18. | Khawaja Abdul Mujeeb: Studies on insecticide resistance in <i>Tribolium castaneum</i> (Herbst.) | 2002 |
| 19. | Amjad Javed: AML as transcriptional regulator and osteoblast differentiation mediator | 2002 |
| 20. | Shahid Nadeem: Bacterial isolates and their improvement for better amino acid fermentation for glutamine and lysine | 2002 |
| 21. | Nazia Khurshid: Studies on the locally isolated strains of <i>Bacillus</i> for their possible use as bioinsecticides | 2003 |
| 22. | Syed Kaleem Zaidi: Role of interacting proteins in CBF α /AML/PEPB2 α mediated gene regulation | 2003 |
| 23. | Khalil Ahmad: Study on the common bacterial etiologic agents of diarrhoea and dysentery in the Northern area of Pakistan and their sensitivity pattern. | 2004 |
| 24. | Ali Mohammad: Toxicological effects of industrial effluents dumped in river Kabul on Mahaseer <i>Tor puitora</i> at Aman Gar Industrial area Nowshera, Peshawar, Pakistan | 2004 |
| 25. | Muhammad Mashhood Ahsan: Biochemical and haematological abnormalities in human population exposed to hexavalent chromium in effluents of tanneries in industrial area of district Kasur. | 2004 |

26. **Nadia Dar:** Studies on yeast strains isolated from industrial areas of Pakistan for detoxication of heavy metals 2004
27. **Samina Qamer:** Biochemical analysis of honey with particular reference to the variety of free amino acids from *Zizyphus jujuba* 2004
28. **Zulfiqar Ali Saqib:** Isolation and characterization of insecticide degrading bacteria 2005
29. **Bushra Muneer:** Role of microorganisms in remediation of heavy metals in industrial wastes. 2005
30. **Muhammad Usman Rashid:** Hereditary breast and/or ovarian cancer in Pakistan: Contribution of *BRCA1* and *BRCA2* genes. 2006
31. **Abdul Rehman:** Survey of Protozoan fauna surviving in stress conditions in industrial wastes and their role in bioremediation . 2006
32. **Muhammad Yunus Rana :** Pathogenesis of Salmonellosis with respect to carrier status in poultry and its public health impact. 2006
33. **Aneela Zamir Durrani :** Epidemiology, serodiagnosis and chemoprophylaxis of theliriosis in bovines. 2006
34. **Faiza Saleem.:** Cloning, characterization and expression of Cry II gene of locally isolated strains of *Bacillus thuringiensis* 2007
35. **Dil Ara Abbas Bukhari:** Cloning, characterization and expression of Cry IV gene of locally isolated strains of *Bacillus thuringiensis* 2007
36. **Deeba Noreen Baig:** Cloning, characterization and expression of Cry IAc gene of locally isolated strains of *Bacillus thuringiensis* 2007
37. **Nighat Shahid Ali:** Toxicity of organophosphorous and synthetic pyrethroid insecticide mixtures on the biochemical components of stored grain pest, *Rhyzopertha dominica* 2010
38. **Rahila Chaudhary:** Molecular identification of metal resistant ciliates and molecular characterization of copper metallothionein gene of *Tetrahymina* 2010
39. **Basharat Ahmad:** Mechanism of plasmid mediated antibiotics resistance in Gram negative bacteria 2010
40. **Rukhsana Nighat Shuja:** Isolation and characterization of cadmium metallothionein gene from local ciliates 2010
41. **Ishrat Aziz:** Spectrum of p53 tumor suppressor gene mutations in Pakistani female breast cancer patients 2011
42. **Akbar Ali:** Spectrum of *FLT3* and *NPM1* mutations in acute myeloid leukemia in Pakistani population 2011
43. **Abdul Rauf:** Molecular Characterization, Expression and Purification of Hepatitis B Virus Core Antigen from Pakistani Population 2011
44. **Tania Rauf Shakoori :** Genetic polymorphism of surfactant protein D in chronic obstructive pulmonary disease 2011
45. **Saadat Ali:** α -1-antitrypsin polymorphisms in the potential disease group and healthy control population of Punjab 2011
46. **Soumble Zulfiqar:** Molecular analysis of gene(s) responsible for copper resistance in bacteria isolated from industrial effluents 2011
47. **Bibi Nazia Murtaza:** Molecular analysis and detection of specific mutations in K-Ras (Kirstein Ras viral oncogene homologue) in Pakistani colorectal cancer patients. 2011
48. **Munawar Saleem Ahmad:** Cloning and molecular characterization of CryIC gene from local isolates of *Bacillus thuringiensis* having dual toxicity against lepidopteran and dipteran insects. 2011
49. **Asia Bibi:** Studies on the pattern of genetic alterations in TP53 tumor suppressor gene among Pakistani colorectal cancer patients. 2011
50. **Syed Akhter Ali:** Role of Transcription Factors and Co-repressor Proteins in Epigenetic Regulation of Cell Fate Determination 2011
51. **Basharat Ali:** Epidemiology and molecular characterization of bovine and human tuberculosis in human rural population of Punjab, Pakistan. 2012
52. **Qurat-ul-Ain:** Evidence of distinct molecular pathways and ultrastructural changes in endometrioid and serous carcinoma of uterus in Pakistani population. 2013
53. **Aftab Ahmad Chattha:** Effect of heavy metals (Lead and Arsenic) on differentiation of mammalian mesenchymal stem cells into osteoblasts 2014
54. **Raazia Tasadduq:** Osteogenic potential of herb, *Cissus quadrangularis*: Effect of ethanolic extract on Differentiation of rat mesenchymal stem cells 2013
55. **Adnan Farooq:** Comparative study of human growth hormone variants. 2013
56. **Asraf Hussain Hashmi:** Molecular characterization of viral and host genetic factors in hepatitis C virus infection 2015
- . . .
- ii) **IN PROGRESS**
1. **Rubina Mushtaq** 2011
2. **Gul Afshan : Antibodies against Hepatitis C Virus (HCV) Surface Proteins** 2012
3. **Saira Aftab** 2012

| | | |
|---------|--------------------|--------------------|
| 4. | Madiha | 2012 |
| 5. | Rabail Toor | 2013 |
| Biodata | | Dr. A. R. Shakoori |
| 6. | Nida | 2013 |
| 7. | Hafsa | 2013 |

13. EMPLOYMENT RECORD:

| No. | Name and nature of job | Duration |
|-----|---|---|
| 1. | Visiting Professor, King Saud University, Kingdom of Saudi Arabia | Jan 2014-continuing |
| 2. | Professor Emeritus, University of the Punjab | March 1, 2010 onwards |
| 3. | Distinguished National Professor, Higher Education Commission | April 2005-continuing |
| 3. | Meritorious Professor & Director, School of Biological Sciences, University of the Punjab | July 2002-Continuing |
| 4. | Meritorious Professor & Chairman, Department of Zoology, University of the Punjab | April-September, 2002 |
| 5. | Chairman, Department of Microbiology & Molecular Genetics, University of the Punjab | February-September, 2002 |
| 6. | Director, B.Sc. Hons and Afternoon/Evening Programme, University of the Punjab | July 2001-September 2002 |
| 7. | Professor and Chairman, Department of Zoology, University of the Punjab, Lahore | April 1995-June 1998 |
| 8. | Professor of Zoology, University of the Punjab, Lahore (Teaching Courses on Cell Biology, Molecular Biology, and Biochemistry to M.Sc. and M.Phil. classes. Supervising research of M.Sc., M.Phil. and Ph.D. students. Organizing and supervising sponsored research projects. Participation in Departmental and University administration). | October 21, 1987 September 2002 |
| 9. | Visiting Professor of Cell Biology, University of Massachusetts Medical Centre, Worcester, USA. (Collaborated in Research programme on gene expression during osteoblast differentiation in rat). | January, 1989- June 2012 |
| 10. | Co-Director, Centre for Advanced Molecular Biology, University of the Punjab, Lahore. (To establish the research laboratories in the Centre for research in the field of Molecular Biology. The main objective is to train the manpower in the field of Genetic Engineering and initiate research projects aiming at solving problems of national and global importance). | November, 1984- August, 1991 |
| 11. | Consultant, Midwest Universities Consortium for International Activities (MUCIA) Inc. Pakistan Institutional Excellence Project (IEP), Islamabad. | 1991 |
| 12. | Associate Professor of Zoology, Department of Zoology, University of the Punjab. (Teaching various courses on Cell Biology, Molecular Biology, Biochemistry, Toxicology etc to various post-graduate classes. To conduct and supervise research of M.Sc., M.Phil. and Ph.D. students. To look after the affairs of Library of the Department. To act Chairman in the absence of Chairman. | July 12, 1979- October 20, 1987 |
| 13. | Assistant Professor of Zoology, Department of Zoology, University of the Punjab, Lahore. (Conducting various courses on Cell Biology, and Biochemistry including those of Cell Physiology, Molecular Biology, Biology of Cancer Cell for different graduate and post-graduate classes. Also conducted a course on Cell Biology and Microanatomy in the Post-Graduate Medical Institute Lahore, for medical graduates enrolled for M.Phil degrees. Conducting and supervising research in the field of Cell Biology/Cytology/Pathology/Environmental Pollution/Zoology). | February 16, 1973- July 11, 1979 |
| 14. | Lecturer in Zoology, University of the Punjab. (Taught courses on Cytology, Physiology, Embryology, Anatomy of Chordates, Invertebrata and Microtechnique to the graduate and post-graduate classes. Also introduced a course on Cell Biology for the first time in the Department of Zoology, University of the Punjab). | November 18, 1963- February 15, 1973 |
| 15. | Lecturer in Zoology, Government Degree College, Jhelum, Pakistan. | Dec. 1962-Nov.1963 |
| 16. | Part-time Demonstrator in Zoology, University of the Punjab, Lahore, Pakistan. (Conducted and supervised practicals in M.Sc.Zoology Classes). | September, 1962- December, 1962 |
| 17. | Student Demonstrator in Zoology, Govt. College, Lahore, Pakistan. | Sessions 1960-1962. |

14. POST DOCTORAL FELLOWSHIPS

| No | Institution | Duration |
|----|--|-----------------------------|
| 1 | .Institut für Biologische Chemie und Ernährungswissenschaft, Universität Hohenheim, Stuttgart, Federal Republic of Germany. | June, 1972 - December, 1972 |
| 2. | Department of Cell Biology, University of Massachusetts, Medical Centre, Worcester, Massachusetts, USA under USAID program. | Jan. 1989 - January, 1990 |
| 3. | Department of Cell Biology, University of Massachusetts, Medical Centre, Worcester, | June, 1992 - October, 1992 |

| | | |
|----|--|---|
| | Massachusetts, USA under Senior Fulbright Fellowship. | April, 1993 - August, 1993 |
| 4. | Department of Cell Biology, University of Massachusetts, Medical Centre, Worcester, Massachusetts, USA. | July, 1994 - October, 1994 July, 1995 - October, 1995 Sept. 1998 - December, 1998 |
| 5. | Institut für Molekularbiologie und Tumorforschung, Universität Marburg, Germany under DAAD's programmes for short term visit (Senior fellowship) | June, 1996 - October, 1996 |
| 6. | Toxicology Unit, Department of Biological Sciences, University of Essex, Colchester, U.K. under The Royal Society of United Kingdom Fellowship. | July, 1999 - September, 1999 |

15. COUNTRIES VISITED

| | Name of Country | Period | Purpose |
|-----|--|--------------------------------|--|
| 1. | West Germany, East Germany, Austria, Hungary, Holland, Belgium, Great Britain, | During 1969-1972 | Attended Scientific Conferences. Visited Biology and Biochemistry Laboratories of Universities of Heidelberg, Switzerland, Czechoslovakia and France. Frankfurt, Stuttgart, Munich, Tübingen, Berlin, Vienna, Budapest, Zurich, Prague, Paris, Brussels, Amsterdam, London, Oxford |
| 2. | Edinburgh (U.K) | March 18- April 10, 1984 | To attend a course on Advances in Biotechnology: Science and Applications, and to visit various |
| 3. | Wurzburg (West Germany). | April 11-28, 1984. | Institutes in U.K. (Edinburg, Glasgow, Hatfield, Swindon) and Germany. |
| 4. | USA (Boston, Worcester, New York, Houston etc). | January 1989- January 1990 | Attended Gordon Research Conference in New Hampshire, USA and Cell Biology meeting in Houston, U Mass Medical Centre, Worcester, MA, USA. |
| 5. | Canada (Montreal) | October 1989 | To attend Bone Research meeting in Montreal. |
| 6. | Scotland (Edinburgh, Stirling) | September 1989 | To attend ODA meeting and to negotiate a linkage programme with University of Stirling on the development of fisheries and aquaculture in Pakistan. |
| 7. | Indonesia (Jakarta, Serpong) | November- December, 1990 | To attend a workshop on Recent Advances in Biotechnology |
| 8. | Thailand (Bangkok) | | |
| 8. | Bangladesh (Dhaka) | January 1993 | To attend National Zoology Conference of Zoological Society of Bangladesh. |
| 9. | USA (Massachusetts) | 1992, 1993, 1994 1995, 1998 | To do collaborative research at University of Massachusetts., USA |
| 10. | Germany (Marburg) | 1996 | To do collaborative research at the University of Marburg under DAAD programme. |
| 11. | UK (Colchester, Essex) | 1999 | To do collaborative research at University of Essex, UK |
| 12. | UK (London) | 1997, 2006, 2007 | Visited Department of Pharmacy, Kings College London, Chelsea Campus, London and held discussion. |
| 13. | USA (Worcester, MA) | 2005, 2006, 2007 2008, 2009 | To do collaborative research at U Mass under PAK-USA collaborative Project |
| 14. | Egypt, Dubai | 2005, 2007 | To attend TWAS meeting in Alexandria and UNESCO meeting in Cairo. |
| 15. | India | 2006 | Visited Research Institutes at Hyderabad, Delhi and Agra. Attended 93 rd All India Science Congress at Hyderabad |
| 16. | Brazil | 2006 | To attend TWAS meeting in Angra Dos Reis, Rio De Janeiro |
| 17. | Italy | 2007 | To attend TWAS meeting in Trieste. Visited Venice and Milan |
| 18. | Mexico City, Mexico | 2008 | To attend TWAS meeting in Mexico City. |
| 19. | Saudi Arabia (Mecca, Madina) | 2009 | To perform Hajj |
| 20. | China (Tianjin) | 2012 | To attend TWAS meeting in Tianjin City. |
| 21. | Argentina (Buenos Aires) | 2013 | To attend TWAS meeting in Buenos Aire |
| 22. | Oman (Muscat) | 2014 | To attend TWAS meeting in Muscat |

16. LANGUAGE PROFICIENCY

| Language | Read | Write | Speak |
|----------|-----------|-----------|-----------|
| English | Excellent | Excellent | Excellent |
| German | Excellent | Excellent | Excellent |
| Arabic | Good | Fair | Poor |

French

Excellent

Good

Poor

17. MEMBERSHIP OF LEARNED SOCIETIES AND OTHER ACTIVITIES IN AND OUTSIDE THE UNIVERSITY.

A) MEMBERSHIPS/FELLOWSHIPS OF LEARNED SOCIETIES:

1) President Zoological Society of Pakistan (2002-2008, 2013-2016)

Bioinformatics Society of Pakistan (2008-)

2) Fellow

- **The World Academy of Sciences (TWAS) (2004- continuing)**
- **Pakistan Academy of Sciences (1991-to-date).**
- Zoological Society of Pakistan (1968-to-date).
- Biological Society of Pakistan (1973-1989).
- Pakistan Association for the Advancement of Science (1974-1978, 1980-1986).
- Scientific Society of Pakistan (1978-1986).
- Pakistan Biological Sciences Society (1990-continuing).
- Pakistan Genetical Society (1996-continuing).

3) Member

- **New York Academy of Sciences (1993, 1994).**
- **American Institute of Biology (1993, 1994).**
- German Association of Biological Chemistry (1968-1972).
- American Society of Cell Biology (1989-1990).
- American Association for the Advancement of Science (1989-90, 1992-1997)
- World Wild Life Fund, Lahore (1990-1993).
- Punjab University Senate (1987-2002).
- Executive Member, Urdu Science Board (1997-continuing).

4) Secretary

- **Pakistan Academy of Sciences (Lahore Chapter) (2002-2004)**
- Zoological Society of Pakistan (1991-1995, 1999-2002, 2009-2012).
- Punjab University Zoologists Association (1975-76).
- Pakistan Association for Experimental Biologists (1979-80).

5) Treasurer

- Zoological Society of Pakistan (1995-1997)

6) Chief Patron

- Zoologists Association of Pakistan (1987-1990).
- Biofound (1995-1999)

B) MEMBER, EDITORIAL COMMITTEE/EDITORSHIP

1) Member, Editorial Committee

- **BULLETIN OF THE DEPARTMENT OF ZOOLOGY**, University of the Punjab (New Series) (1976-1980).
- **PUNJAB UNIVERSITY JOURNAL OF ZOOLOGY** published by Department of Zoology, Punjab University (1986-to-date),
- **PAKISTAN JOURNAL OF ZOOLOGY**, published by Zoological Society of Pakistan (1973-1980).
- **PROCEEDINGS OF THE PAKISTAN CONGRESS OF ZOOLOGY** published by the Zoological Society of Pakistan (1980-Continuing).
- **PAKISTAN JOURNAL OF ENTOMOLOGY**, published by the Entomological Society of Pakistan, Karachi

2) Associate Editor

- **PAKISTAN JOURNAL OF ZOOLOGY**, the Zoological Society of Pakistan (1981-1992).

3) Editor

- **PAKISTAN JOURNAL OF ZOOLOGY**, published by the Zoological Society of Pakistan (1993-Continuing).
- **ANNOTATED TEXTBOOK OF BIOLOGY** for SECONDARY and HIGHER SECONDARY SCHOOLS, prepared under the sponsorship of Islamic Educational, Scientific and Cultural Organization, Rabat, Morocco.

- **TEXTBOOK OF BIOLOGY FOR CLASS XI and XII**, published by Punjab Textbook Board, Lahore (2002-03)

C) **MEMBER OF ADMINISTRATIVE AND EXAMENING BODIES**

- 1) **Member, Board of Studies in Zoology:** University of the Punjab, (1973-1977; 1979-2002); University of AJK, Muzafferabad (1980-1992); Allama Iqbal Open University, Islamabad (1986-1988, 1991-1993); Molecular Biology, University of the Punjab (1983-1989); Islamia University, Bahawalpur (1997-2002).
- 2) **Member, Selection Committee/Board: Punjab Public Service Commission**, for selection of College Teachers (1979-80, 1982-1987, 1990-continuing), of research workers and administrator in Wildlife Dept., Fisheries Department and Health Department (1982-to- date), Centre for Advanced Molecular Biology, University of the Punjab (1981-1989), Bahauddin Zakria University, Multan (1987-1988, 2000) ; University of Agriculture, Faisalabad (1986, 1988, 1990), University of Peshawar (1993), University of Sindh, Jamshoro (1998,1999,2000, 2006, 2007), Sindh Agriculture University, Tandojam (1999, 2000), Institute of Education & research, University of the Punjab (2000-2001).for selection of lectures, Associate Professor and Professors.
- 3) **Examiner in Thesis (based on research work) for the award of M.Sc., M.Phil and Ph.D. Degrees** at the University of Punjab, Lahore, University of Agriculture, Faisalabad and Quaid-e-Azam University, Islamabad (1976-to-date) and University of Karachi. On the panel of Examiners for the award of B.Sc. and M.sc. Degrees in Zoology by the University of the Punjab, Lahore (1962-to-date), University of Agriculture, Faisalabad (1973-1985), University of Baluchistan, Quetta (1979), University of Peshawar (1976, 1979, 1981, 1983, 1985), Baha-ud-din Zakaria University, Multan (1988, 1990, 1991, 1993), and Azad Jammu Kashmir University (1990, 1993).
- 4) **Head Examiner of Zoology** (and Biology) of Board of Intermediate and Secondary Education, Lahore (1979-1982). Federal Public Service Commission, for selection of civil service officers (1979, 1981, 1982).
- 5) Official **research guide and Member of Board of Examiners for the award of M. Phil Degrees** to Medical graduates enrolled in the Post-graduate Medical Institute, Lahore (1972-1979, 1990, 1991-Continuing) and Federal Post- graduate Medical Institute, Lahore (1993-continuing)
- 6) **Member of Board of Governors** Centre for Advanced Molecular Biology, University of the Punjab, Lahore,(1981-86) , University of Central Punjab, Lahore (2008), Shaikh Zayed Islamic Centre, University of the Punjab (2008), Centre for Water Research, UET, Lahore (2008).
- 7) **Member, Technical Committees of NSRDB** (1990-1992), PSF (1996-continuing), PARC (1994-continuing)
- 8) **Expert, National Review Committee** for Biology Books of Punjab Text Book Board and Sindh Text Book Board (1990, 1991).
- 9) **Member, Board of Intermediate and Secondary Education**, Faisalabad (1994-1998).
- 10) **Member, Board of Faculty of Engineering and Technology**, University of the Punjab, Lahore (1995-1997).
- 11) **Member, Research Committee, University of the Punjab** (1996-1999)
- 12) **Member, Punjab University Academic and Co-curricular Activities Committee** (1999-2002)
- 13) **In charge, Punjab University Seminars and Symposia Committee** (1999-2002).
- 14) **Punjab University Annual Report Committee: Member (1996-1999), and Chairman** (1999-2002).
- 15) **Member, Peer Review Committee for evaluation of performance of Institutions (Pakistan Council of Science & Technology Committee** (2000-2001).
- 16) **Chairman, Commercial Projects, University of the Punjab (Fisheries, Honeybee & Nursery)**, (2000- 2002).
- 17) **Chairman, Hospital Committee, University of the Punjab** (2001-2002).
- 18) **Member, Medical Committee, University of the Punjab** (1998- 2001).
- 19) **Chairman, Water Quality Evaluation Committee, University of the Punjab** (1999-2002).
- 20) **Chairman, Sports Complex Committee, University of the Punjab**, (1999- 2002)
- 21) **Member, Academic Committee, School of Biological Sciences, University of the Punjab** (2004-cintinuing).
- 22) **Expert, Academic Council, Forman Christian College (a chartered University), Lahore** (2005-2007), **Academic Council, Bahauddin Zakariya University, Multan** (2007-2009), **University of Central Panjab, Lahore** (2008), **Minhaj University, Lahore** (2008), **UMT, Lahore** (2006-20012), **UVAS, Lahore** (2008-2011), **University of Lahore** (2010-coninuing).
- 23) **Expert, Board of Studies in Zoology, GC University, Faisalabad** (2007- 2011)
- 24) **Member Syndicate UVAS, Lahore (2007-continuing) , UMT, Lahore (2007-2009), LCWU (2008-2010).**
- 25) **Member, Institutional Review Board, Shaikh Zayed Medical Complex, Lahore** (2002-2014)
- 26) **Member, Board of Governors, Punjab Curriculum and Textbook Board (2015-continuing)**
- 27) **Chairman, Advisory Board, Urdu Science Board, Lahore (2015-continuing)**
- 28) **Chairman, Apex Academic Committee, PCTB, Lahore (2015-Continuing)**
- 29) **Director, Board of Directors, Punjab Education Foundation, Lahore (2016-Continuing)**
- 30) **Member, Executive Council, Punjab Education Foundation, Lahore (2016-Continuing)**
- 31) **Member, Board of Advanced Studies & Research, University of Central Punjab (2016-Continuing)**
- 32) **Member, Expert Committee, Punjab AIDS Control Programme (2016-Continuing)**
- 33)

D) **ADMINISTRATIVE EXPERIENCE**

- 1) **Director, School of Biological Studies**, University of the Punjab, Lahore (2002-Continuing)
- 2) **Chairman, Department of Microbiology & Molecular Genetics**, University of the Punjab (February-October 2002)

- 3) **Director, B.A./B.Sc. Hons. and Afternoon/Evening Programmes**, University of the Punjab (2000- 2002).
- 4) **Chairman, Department of Zoology**, University of the Punjab, Lahore (1995-1998, April-September 2002).
- 5) **Co-Director, Center for Advanced Molecular Biology**, University of the Punjab (1984-1991).
- 6) **Co-ordinators**, CENTRE FOR ADVANCED STUDIES IN MOLECULAR BIOLOGY, in UNIVERSITY OF THE PUNJAB, Lahore (1981-84).
- 7) Conducted nine research projects as **Principal Investigator** financed by Pakistan Science Foundation, and University Grants Commission, Pakistan Atomic Energy Commission and NSRDB of UGC.
- 8) **Incharge Library**, Department of Zoology, University of the Punjab (1963-1969; 1972-85).
- 9) **Incharge of Pathology Laboratory** of Riaz Ali Shah Medical Centre, Gulberg, Lahore, on part-time basis (1981- 1989).
- 10) **Director, M.Phil. Sandwich Programme in Zoology** of University Grants Commission (1985-88).

E) VISITING PROFESSORSHIP/INVITED LECTURES IN CONFERENCES AND REFRESHER COURSES

- 1) Conducted courses on CELL BIOLOGY and MICROANATOMY for **M.Phil** students in Post-graduate Medical Institute, Lahore and Sheikh Zaid Postgraduate Medical Institute (during 1974-1979, 1991-Continuing) in Anatomy Department, Physiology Department (4 lectures in 1987), course for M. Phil (Anatomy, Physiology, Biochemistry), FCPSP (1990, 1997-continuing).
- 2) Delivered a series of lectures (20) on BIOCHEMISTRY/ MOLECULAR BIOLOGY as a visiting Professor in the Department of Zoology, University of Baluchistan, Quetta during November-December, 1980. This visit was sponsored by UGC.
- 3) Invited to deliver a lecture on STRUCTURE AND FUNCTION OF NUCLEOLUS-A PERSPECTIVE during a fortnightly seminar on ADVANCES IN ZOOLOGY held in the Department of Zoology, University of Sind, Jamshoro during June-July 1977. This seminar was sponsored by University Grants Commission of Pakistan.
- 4) Delivered a lecture on invitation on PRESENT STATUS OF BIOCHEMICAL RESEARCH IN PAKISTAN at FIRST CONGRESS OF ZOOLOGY, held at Quaid-e-Azam University, Islamabad during May, 1980; and another extension lecture on BIOCHEMICAL RESEARCH IN PAKISTAN at second Pakistan Congress of Zoology, held at Sind Agriculture University, Tandojam during December, 1981.
- 5) Lectures on invitation were also delivered in Islamia College, Civil lines, Lahore (Cell fractionation, 1974), Islamia College for Women, Cooper Road, Lahore (Protein synthesis, 1975, 1996, Genetic Engineering 1986), Forman Christian College, Lahore (Recent trends in Cancer Research, 1981; Genetic Engineering, 1982, 1991, 1996,2004), Queen Mary College, Lahore (Genetic Engineering, 1984), Government Superior Science College, Wahdat Road, Lahore (Genetic Engineering, 1985; Chemical basis of Heredity, 1985, Animal Cloning, 1997, 2000, 2001, Gene Expression, 2010), College of Home Economics (Uses of Bacteria, 1985, Wonder Science of Inheritance, 1986, Animal Cloning, 1998), Dyal Singh College (Genetic Engineering, 1986; Molecular basis of Metabolic disorder, 1990), Government College, Lahore (Genetic Engineering, 1986, 1988, 1991), Postgraduate Medical Institute, Lahore (Nucleic acids, four lectures, 1987, 20 lectures on Cell Biology and Nucleic acids, 1990; 12 lectures on Cell Biology and Genetic Engineering, 1991-continuing), Academic Staff Association, Punjab University (Recombinant DNA Technology, February 1994), Government College for Women, Gulberg (How genetic characters are transmitted, May 1995), Department of Physics, University of the Punjab (Genetic Engineering, May 1995), Institute of Education and Research, University of the Punjab (Genetic Engineering, 3 lectures, 1995, 1996), Lahore University of Management Sciences (Role of genetic engineering in economic development of Pakistan, May 1995, March 1996-2003), Lahore College for Women (March 1996, 2000), Government College for Women, Ravi Road (Environmental pollution, 1997), Government College of Education for Science, Township, Lahore (Genetic Engineering and Animal Cloning, 2000), Government Fatima Jinnah College, Chuna Mandi, Lahore (Animal Cloning, March 2006), University of Lahore (Realm of Cell, February, 2012)
- 6) Delivered series of lectures on Cell Biology, Biochemistry and Biochemical Genetics to teachers of intermediate and B.Sc. classes and a series of lectures on Genetic Engineering and Gene-Cloning to teachers of various Colleges during a refresher course organized by University Grants Commission of Pakistan (1974, 1979-1985, 1995).
- 7) Delivered a series of lectures on GENETIC ENGINEERING, PROTEIN SYNTHESIS, Biochemical Genetics to talented students of Intermediate classes during a workshop organized by Board of Intermediate and Secondary Education and University Grants Commission of Pakistan in August of every year from 1981-1986, 1990, 1991, 1997, 1998 at Khanspur Campus of University of the Punjab.
- 8) Delivered a series of lectures on CELL STRUCTURE, CELL DIVISION CELL FUNCTION INCLUDING PROTEIN SYNTHESIS to SCIENCE EACHERS TRAINING during August, 1983. This was sponsored by Ministry of Education and The British Council at Federal Government College of Education for Women, Islamabad.
- 9) Extension lectures on Genetic Engineering and regulation of metabolism for B.Sc. and F.Sc. Zoology teachers during Refresher course organized at Education Extension Centre, Lahore in August, 1987, and July, of every year 1988, 1990- 1992, 1995-1998.
- 10) Delivered lecture on Toxicology of Pesticides in Environmental Protection Agency of Govt. of Punjab in 1988.
- 11) Delivered a series of 12 lectures on Genetic Basis of Heredity for M.Sc. classes in Dept. of Applied Psychology of University of the Punjab during November-December, 1988 and in March-April, 1990-1992.
- 12) Conducted courses on biology for In Service Agriculture Graduates from Balochistan, Northern areas and Azad Kashmir in 1988, 1990, 1991.
- 13) Delivered a seminar on Expression of Osteocalcin gene in Centre for Advanced Molecular Biology in October 1991.
- 14) Delivered lectures on Status of Recombinant Technology Research in Pakistan (December 1990) and Molecular Basis of Carcinogenesis (January 1991) in Azad Jammu and Kashmir University, Muzaffarabad.

- 15) Delivered a talk on Expression on Osteocalcin Gene in Cultured Rat Osteoblasts in Pakistan Academy of Sciences during December 1992.
- 16) Delivered a lecture on the Role Recombinant DNA Technology in Economic Development of a Country in the Department of Zoology, University of Dhaka, Bangladesh on January 16, 1993.
- 17) Delivered a lecture on Experiences in USA in the Fulbright Alumni Association, Lahore, in USIS, January 30, 1994.
- 18) Delivered a lecture on Role of Genetic Engineering on the Economic Development of Pakistan in June 1994, organized by Academic Staff Association of University of the Punjab.
- 19) Delivered series of lecture on molecular biology to in-service college teachers in a program organized by UGC, on December 16-24, 1995.
- 20) Delivered a lecture on "Glucocorticoid control of osteocalcin gene transcription" on 1 August 1996 in Philipps-Universitat Marburg, Germany.
- 21) Delivered a lecture on Industrial pollution in Government College for Women, Timber Market, Ravi Road, Lahore in July 1997.
- 22) Delivered a lecture on "Genetic Engineering and Animal Cloning" in Government College of Education for Science on March 6, 2000.
- 23) Delivered lectures on "Regulation of Gene Expression", "Genetic Manipulations and their role in Developments in Medicine, Agriculture and Industry", and "Gene Therapy" to Ph.D. students in The Aga Khan University, Karachi during March 2000, in Lahore University of Management Sciences, Lahore (since 1996) and College of Physicians and Surgeons, Lahore (since 1997).
- 24) Delivered lecturers on Molecular Biology and Genetics to FCPS Class in College of Physicians and Surgeons, Pakistan, Lahore in 1996- 2004.
- 25) Delivered lecturers on Molecular Biology, and Biochemistry to M.Phil/Ph.D. class in the Department of Physiology of University of Health Sciences in 2005.
- 26) Taught courses on Biochemistry, Cell Biology, Molecular Biology, Gene Expression, Gene therapy in Department of Microbiology & Molecular Genetics, and Department of Botany, University of the Punjab, during 2002- 2006.
- 27) Taught Cell Biology Courses in Institute of Biochemistry & Biotechnology, University of the Punjab during 2004-2005.
- 28) Taught Bio 101 (Biological Principles) course and a part of Bioinformatics Course in Summer, 2006 and Winter 2007 At Lahore University of Management Sciences in 2005- 2007
- 29) Taught course on Molecular Genetics to Ph.D. Students in University of Central Punjab (2015-2016)
- 30) Delivered Plenary Lecture on "Recombinant DNA Technology" in University of Central Punjab on December 2, 2016.

F) TELEVISION/RADIO PROGRAMMES

- 1) Participated and delivered an illustrated lecture on INSTINCTIVE AND LEARNED BEHAVIOUR in SCIENCE MAGAZINE PROGRAMME of PAKISTAN TELEVISION 1974.
- 2) Delivered lecture on NOBEL PRIZE WINNERS in SCIENCE MAGAZINE PROGRAMME of PAKISTAN TELEVISION in 1974.
- 3) Delivered a series of lecture on CANCER in SCIENCE FORUM (UNIVERSITY PROGRAMME) of CHANNEL 2 of LAHORE RADIO STATION in 1975.
- 4) Participated in a discussion on CAMB in RADIO PROGRAMME in 1986.
- 5) Discussion on the "ROLE OF YOUTH in the DEVELOPMENT OF SCIENCE in PAKISTAN"-a RADIO TALK on March 27, 1986.
- 6) Television Programme on the "HAZARDS OF PESTICIDES" on 15.5.1986.
- 7) Radio Programme on "CAREFUL USE OF POISON" on 30th May, 1986, 1988, 1990.
- 8) Participated in PTV's talk show PRIDE SHOW on Dr. Anwar Nasim during February 2000.
- 9) A series of 10 programmes based on research activity of my laboratory were held in PTV World under the auspices of **Kissan Time** during July-September 2002, and June 2003. These programmes were on **Bioinsecticides, Fish Production, Honey Production, Osteocalcin Gene Expression, Industrial Waste Water Treatment Insecticide Resistance, Health Hazards due to Insecticidal Spray. Also participated in a Panel Discussion** in Kissan Times on Environmental Pollution.
- 10) Appeared in PTV NEWS programme AWARD YAFTA on February 27, 2011.
- 11) Appeared in PTV NEWS programme KASB-e-KAMAL on September 30, 2016.
- 12) Appeared in PTV NEWS MORNING SHOW by Juggan on November 10, 2016 on the occasion of World Science Day 2016.

G) ORGANIZATION OF CONGRESSES/SEMINARS; AND PARTICIPATION IN CONFERENCES/PRESIDED/PRESENTED PAPERS

- 1) **Presented paper** in Second meeting of **European Nucleolar Workshop of the European Cell Biology Organization** held at Lake Balaton (**Hungary**) from September 27, 1971 to October 01, 1971.
- 2) Second **international symposium on Zonal Centrifugation** held in Guildford, **Surrey (U.K.)** in December, 1971.
- 3) **Presented paper** in **Summer meeting of Association of Biological Chemistry** held in Bochum (**West Germany**) from May 23 to May 25, 1972.
- 4) **Presented paper** in Eighth meeting of Federation of **European Biochemical Society** held in **Amsterdam** in August, 1972.
- 5) **Presented paper** in 24th All at the University of Islamabad, Pakistan in June, 1973.
- 6) Seminar on **Advances in Zoology** held at the Department of Zoology, University of Sind for a fortnight in June-July, 1977 sponsored by the University Grants Commission of Pakistan. Presented a review article on **Nucleolus Biochemistry**.

- 7) Eighteenth Annual Science Conference of the **Scientific Society of Pakistan** held at the University of Multan, from 30 December, 1977-3 January, 1978.
- 8) **Member, Organizing Committees, Also participated and presented research papers. First Congress** of Zoology held at Quaid-e-Azam University, Islamabad, in May, 1980; **Second Congress** of Zoology, held at University of Agriculture, Tandojam, in December, 1984; **Third Pakistan Congress** of Zoology, held at University of Agriculture, Faisalabad on 27-29 December, 1982. **Fourth Pakistan Congress** of Zoology, held at University of Peshawar in 22-24 December, 1983; **Fifth Pakistan Congress** of Zoology, held at University of Karachi, Karachi on 8-10 January, 1986; **Sixth Pakistan Congress** of Zoology, University of the Punjab, December, 22-24, 1986; **Seventh Pakistan Congress** of Zoology, University of Baluchistan, Quetta, April 25-27, 1987; **Eighth Pakistan Congress** of Zoology, University of Peshawar, April, 1988. **Tenth Pakistan Congress** of Zoology, Khanaspur Campus, May 26-27, 1990. **Eleventh Pakistan Congress** of Zoology, May 25-26, 1991. **Twelfth Pakistan Congress** of Zoology, held at Government College Lahore on April 11-12, 1992. Thirteenth Pakistan Congress of Zoology held at UGC, Islamabad on March 31-April 1, 1993, **Fourteenth Pakistan Congress** of Zoology held at University of Karachi on April 1-3 1994. **Fifteenth Pakistan Congress** of Zoology, held at NARC, Islamabad on April 15-17, 1995, **Sixteenth Pakistan Congress** of Zoology held at Quaid-i-Azam University, Islamabad, 1996, **Seventeenth Pakistan Congress** of Zoology held at University of Karachi in April 1997. **Eighteenth Pakistan Congress** of Zoology held at the University of the Punjab in April 1998. **Nineteenth Pakistan Congress** of Zoology held at NARC, Islamabad, in April 1999, **wentieth Pakistan Congress** of Zoology held at University of Sindh, Jamshoro on March 28-30, 2000, **Twenty First Pakistan Congress of Zoology**, held at University of Agriculture, Faisalabad on April 15-17, 2001, **Twenty Second Pakistan Congress of Zoology**, held in University of Azad Jammu & Kashmir, Muzaffarabad, Azad Kashmir on April 16-18, 2002. **Twenty Third Pakistan Congress of Zoology**, held in University of Arid Agriculture, Rawalpindi on March 3-5, 2003, **Twenty fourth Pakistan Congress of Zoology** held in AIU, Islamabad on March 30-April 1, 2004, **Twenty Fifth Pakistan Congress of Zoology**, held in Sindh Agriculture University, Tandojam on March 1-3, 2005, **26th Pakistan Congress of Zoology**, University of the Punjab, Lahore April 4-6, 2006. **27th Pakistan Congress of Zoology** Bahauddin Zakariya University, Multan February 27-March 1, 2007, **28th Pakistan Congress of Zoology**, GC University, Faisalabad, March 18-20, 2008, **29th Congress of Zoology**, University of Sindh, Jamshoro., February 24-26, 2009; **30th Pakistan Congress of Zoology**, University of Agriculture, Faisalabad, March 2-4, 2010., **31st Pakistan Congress of Zoology**, held in University of Azad Jammu & Kashmir, Muzaffarabad on March 1-3, 2011. **32nd Pakistan Congress of Zoology** held at Government College University, Lahore on March 6-8, 2012. **33rd Pakistan Congress of Zoology** held at Jinnah Convention Centre, organized by Zoological Society of Pakistan and Pakistan Museum of Natural History, Islamabad on April 2-4, 2013, **34th Pakistan Congress of Zoology** held at Bahauddin Zakariya University, Multan, organized by Zoological Society of Pakistan and Bahauddin Zakariya University, Multan, on February 25-27, 2014, 2014. **35th Pakistan Congress of Zoology** held at CEMB, University of Karachi, on March 1-4, 2015., **36th Pakistan Congress of Zoology held at University of Sind, Jamshoro** February 16-18, 2016.
- 9) 26th-27th All Pakistan **Science Conference**, held at University of Engineering and Technology on 29th December-2 January, 1980, and 28th All Pakistan Science Conference held at University of Multan, Multan in March, 1982.
- 10) Symposium on **Agricultural Genotoxicity in Developing Countries** held on November 1-5, 1982 in Islamabad, sponsored by Pakistan Agricultural Research Council and U.S. National Science Foundation.
- 11) **Organizer** of 3 day international Seminar on RECENT TRENDS IN MOLECULAR BIOLOGY, held in the University of the Punjab on January 11-13, 1982. Also **presented a paper**.
- 12) **Member, Organizing Committee**, Fourth International Bacteriophage Mu Workshop, held at the Centre for Advanced Molecular Biology during December 3-10, 1983.
- 13) **Participated** in National Workshop on Biology Education sponsored by UNESCO, Ministry of Education and Department of Biological Sciences, Quaid-e-Azam University, Islamabad, 16-24 February, 1983.
- 14) Seminar on Science and Technology sponsored by Ministry of Science and Technology and Pakistan Science Foundation and Association of Pakistani Physicians of North America held in Islamabad during 26-30 December, 1983.
- 15) **Advances in Biotechnology: Science and Applications**, Sponsored by the British Council held at **University of Edinburgh** on March 18-30, 1984. Presented a paper.
- 16) **Organizer** of International Training Course on Gene Cloning in Bacteria held at Centre for Advanced Molecular Biology,
- 17) **Member Local Organizing Committee** of International Symposium-Workshop on Application of Genetic Engineering to Basic Biology and Agriculture, held at CAMB, University of the Punjab, from November 21-28, 1984. This symposium was attended by two Nobel Laureates Prof. Dr. J.D. Watson and Prof. Dr. Hamilton O. Smith, in addition to member of other prominent scientists from USA, Canada, U.K., Korea, China and Germany.
- 18) **Member, Local Organizing Committee** First National Training Course on Modern Methods of Gene Conservation held in Centre for Advanced Molecular Biology from Feb 9-19, 1985.
- 19) **Course Director**, Sandwich M.Phil. Programme in Zoology 1985-89, University of the Punjab, Sponsored by UGC.
- 20) International Symposium on Biologically Active Macromolecules held at the University of Baluchistan, Quetta from March 30-April 4, 1985. **Presented a paper**.
- 21) International minisymposium on New Frontiers in Biological Research held at CAMB on October 21, 1986. **Presented a paper**.
- 22) **Member, Local Organizing Committee**, National Training Course on Basic Molecular Genetics and Recombinant DNA

- Techniques held in CAMB from Feb. 10-March 03, 1986.
- 23) **Member, Organizing Committee**, Second International Symposium-Workshop on the Application of Genetic Engineering, held at Centre for Advance Molecular Biology, University of the Punjab, Lahore, Pakistan on October 18-22, 1987.
- 24) Physiology Symposium held at post-graduate Medical Institute, Lahore held on 3rd-5th October, 1987.
- 25) First Medical Biochemistry Symposium held at Post-graduate Medical Institute, Mayo Hospital Lahore, on October 29-30 1988.
- 26) **Gordon Research Conference held at Portsmouth, New Hampshire, USA** in July, 1989.
- 27) Meeting of **Bone Research group held at Montreal, Canada** on September, 1989.
- 28) Annual meeting of **American Society of Cell Biology held at Houston, USA** in November, 1989
- 29) **Workshop-Symposium on Recent Advances in Biotechnology Organized by COMSTECH at Jakarta, Indonesia** in November 26-29, 1990. **Presented a paper** on Status of Biotechnology Research in Pakistan.
- 30) **Presided over a scientific session** of 3rd International, Congress of Asian Homoeopathic Medical League held in Avari, Lahore on 23-26 November, 1990.
- 31) **Presided over and presented a research paper** in First Symposium on Fish and Fisheries of Pakistan held at Govt. College, Lahore on October 19, 1991.
- 32) **Presided over and presented a research paper** in Symposium on Contemporary Biology organized by Pakistan Biological Sciences Society, Islamabad on November 7-10, 1991.
- 33) **Presided over and presented a paper** in National Zoology Conference Of Zoological Society Of Bangladesh on January 14 1993, in Institute of Food and Radiation Biology in Savar, Dhaka, Bangladesh.
- 34) **Presented a paper** in International Symposium on Biotechnology for Sustainable Development held in NIBGE, Faisalabad, on December 15-20, 1993.
- 35) **Presided over and presented a paper** on Effect of Insecticides on Fish in a symposium Aquaculture and Fisheries Development in Pakistan, organized by Punjab Fisheries Department, Lahore in March 1994.
- 36) **Presided over and presented a paper** on Cell cycle regulated expression of cytokines and transcription factors in FDCP-1 cells in a meeting of Pakistan Association of Biochemists held on April 2-5, 1995 in Avari, Lahore.
- 37) **Presided over and presented a paper** on Gene expression in FDCP-I cells in an International Symposium - Workshop, Applications of molecular biological Researches in Agriculture, Health and Environment held on April 8-11, 1995 at CAMB, **University of the Punjab, Lahore.**
- 38) **Presided over and delivered plenary lecture** on Vitamin D - mediated osteocalcin gene expression at the 5th Biennial PMRC Congress, held at Aga Khan University on April 19-20, 1995.
- 39) **Presided over and delivered a popular awareness lecture** on Gene Therapy - Science of 21st Century in November 26-28, 1996 in Islamabad at the time of 1st Inaugural International Conference of Genetics held at NARC, Islamabad.
- 40) **Presented paper in 1st National Symposium on Biotechnology** for Sustainable Development in Government College, Lahore, November 24, 1997.
- 41) **Participated in Symposium on Biotechnology**, Organized by Council of Science and Technology, Islamabad in November 1997.
- 42) International Symposium on Science and Technology for National Development, Organized by COMSTECH in Islamabad on December 13-14, 1997.
- 43) **Attended THIRD ANNUAL RESEARCH RETREAT** of University of Massachusetts Medical Centre held at Marine Biological Laboratories, Woods Hole, Massachusetts, USA on November 8-10, 1998.
- 44) Attended a seminar on **Emerging Environmental Issues in Pakistan** organized by Pakistan Academy of Sciences and Energy & Environment Society of Pakistan on December 5-7, 1998, and **presented a paper** on Bioremediation of Industrial waste water.
- 45) Attended 7th International **conference on Biochemistry and Molecular Biology** held at Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore in June 2003 and presented a research paper.
- 46) Attended and presented a research paper in 16th Meeting of **Medical Research Society of Pakistan** held at Shaukat Khanum Memorial Cancer Hospital & Research Centre, Lahore on December 20, 2003.
- 47) Attended and presented a paper in two day seminar on **Bioinformatics, Information Technology and Biostatistics** held in National College of Business Administration & Economics, Lahore on December 27-28, 2003.
- 48) Organized and also delivered a Plenary lecture in an **International Symposium on Nanochemistry: Chemistry, Biochemistry, Molecular Biology & Bioinformatics of Enzymes** in School of Biological Sciences, University of the Punjab on September 20-21, 2006.
- 49) Organized an International Symposium on **Glycoproteins in Health and Diseases** in School of Biological Sciences, University of the Punjab on May 27-29, 2009. Also delivered a Plenary lecture.
- 50) Participated and made presentation as an invited lecture in the **3rd International Symposium-cum-Training Course on Molecular Medicine and Drug Research** held at International Center for Chemical and Biological Sciences, University of Karachi on January 30-February 6, 2011.
- 51) Delivered a lecture on "Heavy Metal Efflux: A Mechanism of Metal Detoxification in Prokaryotes" on June 28, 2012 at Pak-Chins Joint Symposium on "Applications of Biotechnology in Plant and Animal Sciences" held at Sindh Agricultural University, Tandojam.
- 52) Participated and made presentation as an invited lecture in the **4th International Symposium-cum-Training Course on Molecular Medicine and Drug Research** held at International Center for Chemical and Biological Sciences, University of Karachi on January 7-February 10, 2013

- 53) Participated and made presentation as an invited lecture in **the International Conference on Biotechnology: Prospects & Challenges in Agriculture, Industry, Health and Environment** held at National Institute of Biotechnology and Genetic Engineering, Faisalabad, April 22-26, 2013.
- 54) Participated and made presentation as an invited Resource Person in the **International Biosafety and Risk Management Workshop I** held at Karakoram International University, Gilgit, Pakistan, June 11-16, 2013. Jointly organized by KIU, Gilgit, Fogarty International, NIH, Bethesda, USA and Pakistan Biosafety Association.
- 55) Delivered an invited talk on “What are genes? How do they Work?” In University of Sargodha on December 18, 2014 in Department of Biological Sciences.
- 56) Delivered an invited talk on “Prospects of a local herb, *Cissus quadrangularis* on osteogenic differentiation of mammalian cell lines” in a Seminar Series- Biomedical Materials Thematic Area – Pak-China Business Forum 2015 on 29th March 2015 organized by COMSATS, Islamabad.
- 57) Delivered a plenary lecture “Molecular Biology Research Techniques in Current Scenario” in a National Conference on Cutting-Edge Techniques in Molecular Research organized by IBB, University of Veterinary and Animal Sciences, Lahore on 12th March 2015.
- 58) Chaired Inaugural lecture by Prof. Dr. Simon Silver, UI, USA on March 25, 2015 at the 10th Biennial International Conference of Pakistan Society for Microbiology held on March 25-28, 2015 at MMG, University of the Punjab, Lahore
- 59) Delivered an invited lecture “What are genes? How do they work?” in University of Sargodha on March 19, 2015.

H) CONTRIBUTIONS TOWARDS CURRICULUM DEVELOPMENT IN BIOLOGY AND ZOOLOGY

Being member of Boards of Studies in Zoology and Molecular Biology, I have contributed tremendously towards modernization and frequent revision of curricula and syllabi at school, college and University level. Besides that I have been member of the following committee, which suggested drastic changes in various curricula and syllabi. Most of these suggestions were later adopted and implemented all over the country.

1. National Workshop on Biology Education, sponsored by UNESCO, 1983.
2. Committee of Ministry of Education for revision of Syllabi from class 6 to 16, 1985.
3. Member of the Committee of UGC and Government of Pakistan, which presented a model Biology Syllabi (Secondary and High Secondary level) for all the Ummah countries to Islamic Educational, Scientific and Cultural Organization in Rabat.
4. National Committee of UGC to frame courses for B.Sc. and M.Sc. classes for uniform adoption throughout in Pakistan.
5. Member of the Committee of UGC and Government of Pakistan, which prepared Model Curriculum for undergraduate (B.Sc. and licence) courses in Biology for all the Ummah Countries and presented to ISESCO, Rabat.
6. Member and Expert, National Review Committees for Biology Books of Class XI and XII prepared by The Punjab and Sind Textbook Boards, sponsored by Ministry of Education, Government of Pakistan.
7. Member of UGC Core Committee for Modernizing Syllabi of Zoology for B.Sc. and M.Sc. Classes (1992- 2002)
8. Member, Governing Body, Punjab Curriculum and Textbook Board, Gulvberg, Lahore (February 2015-).

I) COMPILATION/AUTHORSHIP OF BOOKS

- 1) **A QUESTION BANK IN ZOOLOGY (TEST ITEM POOL ZOOLOGY)** published by the UGC , 1985. This book comprises of about 6,000 questions, covering various branches of Zoology. The compilation of questions for this book was sponsored by the University Grants Commission. It will be used as a standard of teaching of Zoology in all the Universities and Colleges of Pakistan.
- 2) **SEVENTY FIVE YEARS OF POSTGRADUATE TEACHING AND RESEARCH IN ZOOLOGY IN UNIVERSITY OF THE PUNJAB.** This book was compiled as part of Centenary Celebrations of University of the Punjab. This has now been published as a supplement of BIOLOGIA, a scientific Journal published by the Biological Society of Lahore, Pakistan.
- 3) **SOUVENIR 1985**, Published at the occasion of Sixth Pakistan Congress of Zoology held in University of the Punjab, 1985. Sponsored by the Zoological Society of Pakistan.
- 4) **ANNOTATED TEXT BOOK OF BIOLOGY FOR SECONDARY SCHOOL.** Published by ISESCO, Rabat, Morocco. I am the Editor of the book and have also **written a chapter on Cell Biology and Genetics.**
- 5) **ANNOTATED TEXTBOOK OF BIOLOGY FOR HIGHER SECONDARY SCHOOL**, published by ISESCO, Rabat, Morocco. I am the Editor of the book and have also **written nine chapters on Cell Biology, Molecular Biology, Genetics and Evolution.**
- 6) **SOUVENIR 1998.** Published at the occasion of Eighteenth Pakistan Congress of Zoology held at the University of the Punjab in April 1998.
- 7) **CLONING- AN INTRODUCTION** a book written in 1999 under a special request by Urdu Science Board, Pakistan.
- 8) **FROM GENETIC ENGINEERING TO ANIMAL CLONING**, 2000.
- 9) **NOBEL PRIZE WINNING DISCOVERIES**, published by Urdu Science Board, Lahore, 2002
- 10) **TEXTBOOK OF BIOLOGY FOR CLASS XI AND XII** published by Punjab Textbook Board, Lahore, 2002, 2003.
- 11) **CLONING- AN INTRODUCTION** (an extensively revised version) updated with figures in four colours in 2006

- published by Urdu Science Board, Upper Mall, Lahore, Pakistan.
- 12) **QAMER, S. and SHAKOORI, A.R. : COMPOSITION OF HONEY PRODUCED BY ASIAN AND EXOTIC HONEYBEES.-Composition of Honey Produced by the Asian and Exotic Honeybees** Paperback -09-2010, VDM Verlag, Dr. Muller Aktiengesellschaft &CO KG. ISBN 9783639008289. Pp. 236.
 - 13) **YOUSAFZAI, A.M. AND SHAKOORI, A.R., 2011. Pollution of Large Sub-Tropical Rivers- River Kabul, Pakistan.** VDM Verlag, Dr. Muller Aktiengesellschaft &CO KG. ISBN 978-3-639-33934-5.
 - 14) **KHAN, M.J., KANWAL, M. AND SHAKOORI, A. R., 2011. Interferon Beta 1 Gene and Human Cancer.** VDM Verlag, Dr. Muller Aktiengesellschaft &CO KG., Germany. ISBN 978-3-639-35935-0
 - 15) **SHAKOORI, A.R. AND REHMAN, A., 2011. Protozoan Fauna of Industrial Wastes and their Role in Bioremediation ,** VDM Verlag, Dr. Muller Aktiengesellschaft & CO KG. Germany. ISBN 978-3-639-36906-9.
 - 16) **SHAKOORI, A.R. AND BUKHARI, D.A., 2011. Molecular Characterization of Cry4 Gene from *Bacillus thuringiensis*.** VDM Verlag, Dr. Muller Aktiengesellschaft &CO KG. Germany. ISBN 978-3-639-37596-1. Pp. 345
 - 17) **SHAKOORI, A.R. AND AHMED, B., 2011. Plasmid Mediated Antibiotic Resistance in Gram-Negative Bacteria.** VDM Verlag, Dr. Muller Aktiengesellschaft &CO KG. Germany ISBN 978-3-639-37920-4
 - 18) **DAR, S. AND SHAKOORI, A.R., 2011. Cadmium Metallothionein Gene of *Paramecium*. Cloning and Expression of a Synthetic Gene of *Paramecium* species.** LAP Lambert Academic Publishing GmbH & Co.KG, Germany. ISBN 978-3-8454-77140-2
 - 19) **SULEMAN, A. AND SHAKOORI, A.R., 2011. Physiological Importance of Cadmium Metallothionein Protein- Cloning, Expression Purification and Physiological Importance of *MutTMCd1* Gene."** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN 978-3-8454-7719-0.
 - 20) **ZAHID, N. AND SHAKOORI, A.R., 2011. Functional Analysis of Promoter4 of *cus* Operon - Activity of Copper-mediated Induction of *cus* Operon Promoter in *E. coli*.** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN 978-3-8465-0511-3
 - 21) **SHUJA, R.N. AND SHAKOORI, A.R., 2011. Cadmium metallothionein genes of ciliates: Isolation and characterization of cadmium metallothionein genes.** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN-13 978-3-8465-3139-6. pp.160.
 - 22) **CHAUDHARY, R. AND SHAKOORI, A.R., 2011. Copper metallothionein Gene of *Tetrahymena*. – Copper Metallothionein Gene Isoforms.** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN 978-3-8465-1669-0.
 - 23) **SALIHA, Z., SATTAR, A., FARID, A. AND SHAKOORI, A.R., 2012. Termites of Pakistan & their Control.** Zoological Society of Pakistan, pp. 102. ISBN 9078-969-9715-00-6
 - 24) **KANWAL, M., KHAN, M.J. AND SHAKOORI, A.R., 2012. Acute lymphoblastic leukemias (ALL) and interferon beta-1 genes: Mutational analysis of interferon beta 1 (IFN1).** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN-13: 978-3-6592-3041-7. pp.172
 - 25) **SALEEM, F. AND SHAKOORI, A.R., 2012. Development of Bioinsecticides: Molecular characterization of *cry2* gene from Pakistani isolates of *Bacillus thuringiensis*.** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN-13: 978-3-8484-4231-7. pp.168.
 - 26) **SHAKOORI, T.A. AND SHAKOORI, A.R., 2013. Role of surfactant protein D in chronic Obstructive Pulmonary Disease.** LAP Lambert Academic Publishing GmbH & Co. KG, Germany. ISBN-13: 978-3-659-34158-8. pp.168.
- Chapter 1: Introduction to Chromosomes by A. R. Shakoori**
Chapter 3: Organization of Genetic Material into chromosomes by A. R. Shakoori
Chapter 12: Structural Changes in chromosomes by A.R. Shakoori, Saira Aftab and Khalid Al-Ghanim
Chapter 13: Numerical changes in chromosomes by A. R. Shakoori, Saira Aftab and Farah Rauf Shakoori
Chapter 16: Fluorescent in situ Hybridization (FISH) and its Applications by A. R. Shakoori
In : Chromosome Structure and Aberrations Edited by Tariq Ahmad Bhat and Aijaz Ahmad Wani
Published by Springer Nature, India

18. REFEREES

1. **Prof. Dr. G Stein**, Co-Director, VermontCancer Center, Chairperson, Department of Biochemistry 149 Beaumont Ave. HSRF 326 ,Burlington, VT 05405, USA
2. **Prof. Dr. Shamshad H. Gilani**, Department of Anatomy, School of Medicine, Newark College of Medicine & Dentistry, 100 Bergen Street, Newark, New Jersey 07130, USA.
3. **Prof. Dr. Janet Stein** , Department of Biochemistry, University of Vermont College of Medicine, 210E Given, 89 Beaumont Ave, Burlington, VT 05405, USA.
4. **Prof. Dr. Qasim Jan**, Advisor Science, COMSTECH, 3-Constitution Avenue, G-5/2, Islamabad.
5. **Lt. Gen. (Rtd) Muhammad Safdar**, Ex-Governor of the Punjab, Askari Villas, Rawalpindi Cantt.
6. **Prof. Dr. Khalid Mahmood Khan**, Ex-Vice-chancellor, Arid Agriculture University, Rawalpindi.
7. **Prof. M. Akhtar FRS**, Director General, School of Biological Sciences, University of the Punjab, New Campus, Lahore 54590
8. **Prof. Dr. Nasir ud Din**, Institute of Molecular Sciences and Bioinformatics, Nisbet Road, Lahore
9. **Prof. Dr. M. D. Shami**, Pakistan Academy of Sciences, Constitution Avenue, Islamabad, Pakistan
10. **Prof. Dr. Peter C. Wynn**, McCaughey-CSU Professor of Animal Production, School of Animal and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga NSW 2678, Boorooma Street' North Wagga NSW, Australia
10. **Prof. Dr. Daniel C. Hoessli**, Department of Pathology & Immunology, Centre Medical Universitaire, Geneva, Switzerland.
11. **Prof. Dr. Andre J. van Wijnen**, Department of Orthopedic Surgery & Biochemistry and Molecular Biology Mayo Clinic 200 First Street SW, Medical Sciences Building,3-69, Rochester, MN 55905, USA
12. **Prof. Dr. Atta ur Rahman**, President, Pakistan Academy of Sciences, Constitution Avenue, Islamabad.
13. **Prof. Dr. Tallat Naseer Pasha**, Vice chancellor, University of Veterinary & Animal Sciences, Lahore.
14. **Prof. Dr. Mujahid Kamran**, Vice Chancellor, University of the Punjab, Lahore, Pakistan
15. **Prof. Dr. Amjad Javed**, Institute of Oral Health Research, School of Dentistry, University of Alabama at Birmingham, 714 School of Dentistry Building, 1530 3rd avenue S, Birmingham AL 35294-0007, USA
16. **Dr. Munzoor H. Soomro**, Chairman, ECO Science Foundation, Islamabad

19. LIST OF PUBLICATIONS:

A) RESEARCH PAPERS ALREADY PUBLISHED

1. **SHAKOORI, A.R.**, 1968. Anatomy and skeletomusculature of *Caenestheria propinqua* (Sars) (Conchostraca, Branchiopoda, Crustacea). *Bull. Dept. Zool. Univ. Punjab (N.S.)*, **2**: 1-48.
2. **SHAKOORI, A.R.**, SCHLATTERER, B. AND SIEBERT, G., 1972. Non-aqueous isolation of nucleoli from rat liver. *Hoppe-Seyler's Z. Physiol. Chem.*, **353**: 758.
3. **SHAKOORI, A.R.**, ROMEN, W., OELSCHLAGER, W., SCHLATTERER, B. AND SIEBERT, G., 1972. A new technique for the isolation of nucleoli from animal cells. *Hoppe-Seyler's Z. Physiol. Chem.*, **353**: 1735-1748.
4. **SHAKOORI, A. R.**, 1973. Isolation of nucleoli and chromatin from bovine seminal vesicle and rat liver in organic solvents by sonication. *Pakistan J. Zool.*, **5**: 1-23.
5. **SHAKOORI, A. R.** AND AHMAD, M.S., 1973. Studies on the liver of chicken, *Gallus domesticus* I. Liver growth and nucleic acids content. *Pakistan J. Zool.*, **5**: 111-117.
6. SIEBERT, G., SCHLATTERER, B. AND **SHAKOORI, A. R.**, 1973. Organic solvent mixture as zonal centrifugation media: separation of nuclei and of nucleoli. In: *Methodological developments in biochemistry* (Ed. E. Reid), vol. 3: *Advances with zonal rotors*, pp. 157-158, Longman, London.
7. **SHAKOORI, A.R.**, MIAN, N.J. AND AHMAD, M.S., 1974. Effect of thioacetamide on the nucleic acids content of kidney of rabbit. *Biologia Pakistan*, **20**: 163-169.
8. **SHAKOORI, A.R.**, WAHEED, A. AND AHMAD, M. S., 1974. Studies on the liver of chicken, *Gallus domesticus* II. Effect of total body gamma irradiation on the liver growth and nucleic acids content. *Pakistan J. Zool.*, **6**: 73-84.
9. **SHAKOORI, A.R.**, 1974. A preliminary report on the effect of thioacetamide on nucleic acids content and lactate dehydrogenase activity of various fractions of rat liver. *Pakistan J. Zool.*, **6**: 189-191.
10. **SHAKOORI, A.R.**, SHAH, W.A. AND AKHTAR, S., 1975. Studies on the liver of chicken, *Gallus domesticus* III. Effect of additive doses of thioacetamide on the free amino acids pool and soluble protein contents of liver and blood serum. *Pakistan J. Zool.*, **7**: 7-14.
11. **SHAKOORI, A.R.** AND KHAN, S.A., 1975. Thioacetamide-induced changes in the histological structure of rabbit kidney. *Biologia Pakistan*, **21**: 75-85.
12. **SHAKOORI, A.R.** AND KHAN, S.A., 1975. Cytological changes in rabbit liver induced by thioacetamide. *Biologia Pakistan*, **21**: 111-117.
13. **SHAKOORI, A.R.** AND DRAKSHAN, M., 1975. Effect of thioacetamide on the body weight, liver weight, histological structure and the total nucleic acids content of mouse liver. *Pakistan J. Zool.*, **7**: 117-133.
14. **SHAKOORI, A.R.** AND ZHAEEER, S.A., 1975. Effect of thioacetamide on the electrophoretic pattern of blood serum proteins of rabbit. *Pakistan J. Zool.*, **7**: 207-208.
15. **SHAKOORI, A.R.**, ZAHEER, S.A. AND AHMAD, M.S., 1976. Electrophoretic pattern of blood serum proteins of some of the vertebrates of Pakistan. *Nucleus*, **13**: 31-39.
16. **SHAKOORI, A.R.**, AND ASHRAF, F., 1976. Thioacetamide-induced changes in the body weight, kidney weight and the total nucleic acids content of kidney of mouse. *Nucleus*, **13**: 41-47.
17. **SHAKOORI, A.R.**, ZAHEER, S.A. AND AHMAD, M.S., 1976. Response of blood serum proteins and free amino acids to starvation in freshwater teleost, *Channa punctatus* (Bloch.). *Pakistan J. Zool.*, **8**: 25-34.
18. **SHAKOORI, A.R.** AND SHAH, W.A., 1976. Studies on the liver of chicken, *Gallus domesticus* IV. Effect of starvation on the soluble proteins content and free amino acids pool. *Biologia Pakistan*, **22**: 193-199.
19. **SHAKOORI, A.R.**, ZAHEER, S.A. AND AHMAD, M.S., 1976. Effect of malathion, dieldrin and endrin on blood serum proteins and free amino acids pool of *Channa punctatus*. *Pakistan J. Zool.*, **8**: 125-134.
20. **SHAKOORI, A.R.** AND LONE, K.P., 1977. Effect of thioacetamide on the nucleic acids, protein and free amino acids content of liver and kidney of spiny-tailed lizard, *Uromastix hardwickii*. *Biologia Pakistan*, **23**: 65-75.
21. ASHRAF, F., **SHAKOORI, A.R.** AND ASLAM KHAN, M., 1977. Nucleic acids content of *Anopheles stephensi* collected from different localities of Iran and Pakistan. *Pakistan J. Zool.*, **9**: 99-105.
22. **SHAKOORI, A.R.** AND KHAN, M.A., 1977. Structural changes induced by total extrahepatic biliary obstruction in rat liver. *Pakistan J. Zool.*, **9**: 209-243.
23. **SHAKOORI, A.R.** AND LONE, K.P., 1977. Effect of stronger doses of thioacetamide on the liver and kidney of *Uromastix hardwickii*. *Nucleus*, **14**: 27-34.
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15. **SHAKOORI, A.R.**, SHAKOORI, F.R. AND AHSAN, M., 1998. Assessment of physiological and genetic defects in human population exposed to industrial pollutants in the industrial area of district Kasur, Pinjab, Pakistan. Final Technical Report of the PSF Research Project P-PU/Envr (36), pp. 171.
16. SAMI, A.J. AND **SHAKOORI, A.R.**, 2007. Role of pest's cellulases in crop damage. Screening of local insect pests for cellulose enzyme activity and its characterization. First Annual Technical Report of research project funded by Higher Education Commission, Pakistan under National Research Grants Program for Universities, pp. 120.

17. SAMI, A.J. AND **SHAKOORI, A.R., 2008**. Role of pest's cellulases in crop damage. Second Annual Technical Report of research project funded by Higher Education Commission, Pakistan under National Research Grants Program for Universities, pp. 107.
18. SAMI, A.J. AND **SHAKOORI, A.R., 2009**. Role of pest's cellulases in crop damage.. Final Technical Report of research project funded by Higher Education Commission, Pakistan under National Research Grants Program for Universities, pp. 102.
19. **SHAKOORI, A.R. AND NASIRUDDIN, 2011**. Final Technical Report of PAS project "Expression and characterization of metallothionein proteins: Multifunctionality of proteins and post translational modification of carboxyl group in protein". Pp.116.

C) THESES WRITTEN BY ME

1. Anatomy of *Caenestheria propinqua* (Sars) 1962; M.Sc. degree; supervisor: **Prof. Dr. Muhammad Saleem**, Department of Zoology, Government College, Lahore).
2. Eine neuartige Methode zur Isolierung von Nucleolen aus tierischen Zellen (1972; Dr. rer. nat. (=Ph.D.) degree; Supervisor: **Prof. Dr. Gunther Siebert**, Institut für biologische Chemie und Ernährungswissenschaft, Universität Hohenheim, Stuttgart, West Germany).

D) THESES WRITTEN UNDER MY SUPERVISION

1. **Nasir Javaid Mian**: Biochemical and cytological effects of thioacetamide on kidney of rabbit (**M.Sc., 1973**).
2. **Mah-e-Drakhshan**: Biochemical and cytological effects of thioacetamide on liver of mouse (**M.Sc., 1973**).
3. **Fauzia Ashraf**: Biochemical and cytological effects of some insecticides on kidney on mouse (**M.Sc.; 1974**).
4. **Abdul Waheed**: Biochemical and cytological effects and gamma radiations on chick liver (**M.Sc.; 1974**).
5. **Saeed Ahmad Khan**: Effect of thioacetamide on the histology of liver and kidney in rabbit (**M.Sc.; 1974**).
6. **Saleem Akhtar Zaheer**: Studies on blood serum protein: an electrophoretic study (**M.Sc. Hons., 1974**).
7. **Umbreen Butt**: Morphological effects of thioacetamide on the development of *Drosophila* sp. (**M.Sc. Hons.; 1975**).
8. **Anis Bukhtiar**: Biochemical effects of thioacetamide on the development of *Drosophila* sp. (**M.Sc. Hons.; 1975**).
9. **Waseem Ahmad Shah**: Studies on blood serum proteins in chick (**M.Sc. Hons, 1974**).
10. **Farkhanda Malik**: Biochemical effects of opium and charas on various organs of mouse (**M.Sc., 1977**).
11. **Lutufullah Virk**: Biochemical effects of cannabis on various organs of mouse (**M.Sc., 1977**).
12. **Mohammad Zahid Butt**: Inhibition of development of *Musca domestica* in the presence of thioacetamide-morphological studies. (**M.Sc., 1979**).
13. **Amina Parveen**: Inhibition of development of *Musca domestica* in the presence of thioacetamine-Biochemical studies (**M.Sc., 1979**).

14. **Riazul-Haq:** Biochemical and haematological changes induced by starvation and refeeding in blood and liver of rabbit (**M.Sc.; 1980**).
15. **Yasmin G. Rasool:** Effect of long term feeding of dieldrin on the blood and liver of rats (**M.Sc.; 1980**).
16. **Arshad Imtiaz Cheema:** Effect of weak doses of thioacetamide on the molecular readjustment after partial hepatectomy in rabbit blood serum (**M.Sc. 1981**).
17. **Afzal Rani:** Biochemical and histological changes in the regenerating liver after thioacetamide treatment of partially hepatectomized rabbit (**M.S.; 1981**).
18. **Mohammad Zafar Iqbal:** Saccharin induced hepatotoxicity in mice. (**M.Sc.; 1981**).
19. **Tasnim Amir Raza:** Cytological studies of adenohipophysis in normal and experimental animals- Detailed study of the effect of PTU on thyrotrophos. (**M. Phil.; 1977**).
20. **Mansoob Ahmad Khan:** Changes induced by ligation of common bile duct on the histological structure of rat liver (**M. Phil.; 1977**).
21. **Nighat Rizvi:** Covalent binding of thioacetamide with nucleic acids and nucleosides: spectrophotometric studies (**M.Sc. 1982**).
22. **Mohammad Amir Khattak:** Covalent binding of thioacetamide with nucleic acids - electrophoretic studies (**M.Sc., 1982**).
23. **Riaz Ahmad:** Isolation of *Micrococcus luteus* mutants resistant to alkylating chemicals (**M.Sc., 1982**).
24. **Mushtaq Ahmad:** Isolation of *Micrococcus luteus* mutants sensitive to alkylating chemicals (**M.Sc., 1982**).
25. **Nahid Kausar:** Effect of anabolic steroid (dimethazine) on the regeneration of liver after partial hepatectomy in male rabbits: studies on liver (**M.Sc., 1982**).
26. **Tallat Anwer Afridi:** Effect of anabolic steroids on the regeneration of liver after partial hepatectomy in male rabbits: studies on blood (**M.Sc., 1982**).
27. **Bushra Chaudhry:** Repair of O2 methylated thymine in bacteria (**M.Sc.,1984**).
28. **Nayyar Abbas Mirza:** Repair of O4 methylated thymine in bacteria (**M.Sc.,1983**).
29. **Maisa Ejaz:** Scanning of bacteria for restriction endonucleases (**M.Sc., 1983**).
30. **Nasima Kausar:** Effect of anabolic steroid on some enzymes of partially hepatectomized rabbit blood serum. (**M.Sc., 1983**).
31. **Sharifa Bibi:** Effect of anabolic steroid on some enzymes of liver of partially hepatectomized rabbit (**M.Sc., 1983**).
32. **Riffat Bashir:** Effect of synthetic pyrethroids on the developing chick embryo liver (**M.Sc., 1983**).
33. **Mohammad Fayyaz:** Effect of synthetic pyrethroids on the stored grain pests *Tribolium castaneum* (**M.Sc., 1983**).
34. **Yasmeen Akhtar:** Expression of locally isolated plasmid in *Micrococcus luteus*. (**M.Sc., 1984**).
35. **Tallat Rana:** Possible covalent binding of DNA with thioacetamide (**M.Sc., 1984**).
36. **Farzana Haq:** Analysis of locally isolated bacteria for the presence of restriction endonucleases (**M.Sc., 1984**).
37. **Raufa Akhtar:** Biochemical characterization of locally isolated indigenous strains of *Rhizobium* species (**M.Sc., 1984**).
38. **Najma Shaheen:** Effect of synthetic pyrethroid on the liver function tests of developing chicks (**M.Sc., 1984**).
39. **Khawaja Abdul Mujeeb:** Toxic effects of lead on the liver and muscle of a freshwater fish (**M.Sc., 1985**).

40. **Mohammad Zahoor Malik:** Biochemical effects of cyhalothrin on *Tribolium* (M.Sc., 1985).
41. **Farah Naz:** Effects of thioacetamide on the growth of bacteria; isolation of possible mutants (M.Sc., 1985).
42. **Faraha Khaggah:** Biochemical effects of cadmium on blood serum and liver of *Gallus domesticus* (M.Sc., 1985).
43. **Shabnam Saeed:** Biochemical effects of a synthetic pyrethroid on *Tribolium* larvae (M.Sc., 1985).
44. **Ghazala Nasreen:** Synergistic effects of malathion and Danitol on the adults of *Tribolium castaneum* (M.Sc., 1986).
45. **Tanveer Ali:** Effect of cadmium on liver and muscle of *Cirrhina mrigala* (M.Sc., 1986).
46. **Kokab Raheela:** Effect of heavy metals (mercury) on biochemical components of regenerating liver following partial hepatectomy in rabbits (M.Sc., 1986).
47. **Ghazala Mahjabeen:** Effect of heavy metal (mercury) on the liver function tests during regeneration following partial hepatectomy (M.Sc., 1986).
48. **Amir Akhtar Malik:** Covalent binding of thioacetamide with DNA - *in vivo* studies (M.Sc., 1986).
49. **Uzma Butt:** Effect of danitol on blood of domesticated rabbits. (M.Sc., 1987).
50. **Raheela Riffat:** Effect of danitol on biochemical components and histological structure of liver of rabbits. (M.Sc., 1987).
51. **Zulfqar Ali Saqib:** Effect of Polytrin C on *Tribolium castaneum*. (M.Sc., 1987).
52. **Mohammad Ayub Qureshi:** Effect of zinc on liver and muscle of grass carp. (M.Sc., 1987).
53. **Akbar Ali Cheema:** Studies on inhibition of acetylcholinesterase of vertebrates by organophosphorus insecticides: acetylcholinesterase of goat brain (Ph.D., 1987).
54. **Najamunnisa Gill:** Studies on autotransplantation of entire skeletal muscles in mammals (Ph.D., 1987).
55. **Farkhanda Malik:** Toxicological effects on deltamethrin on blood and liver of *Gallus domesticus*. (M.Phil., 1988).
56. **Mohammad Javaid Iqbal:** Toxic effects of mercuric chloride on Chinese grass carp, *Ctenopharyngodon idella*. (M.Phil., 1988).
57. **Figar Ahmad:** Toxic effects of danitol on chinese grass carp, *Ctenopharyngodon idella*. (M.Phil., 1988).
58. **Abdul Latif:** Toxic effects of fenvalerate on chinese grass carp, *Ctenopharyngodon idella* (M.Phil., 1988).
59. **Munazzah Sabir:** Effects of Karate (a pyrethroid) on some macromolecular composition of blood of rabbits (M.Sc., 1989).
60. **Jabeen Alam:** Toxic effects of a pyrethroid bifenthrin of the liver of rabbits: Biochemical and histological studies (M.Sc., 1989).
61. **Fauzia Aslam:** Biochemical and histological effects of Karate on the liver of rabbit, *Oryctolagus cuniculus* (M.Sc. 1989).
62. **Farah Aziz:** Toxicological effects of Talstar (Bifenthrin) on haematological and biochemical composition of blood of rabbit *Oryctolagus cuniculus* (M.Sc., 1989).
63. **Sajida Rehman:** Identification, characterization and metal tolerance studies of a locally isolated *Rhodotorula* strain (M.Sc., 1989).
64. **Yasmin Akhtar:** Isolation and restriction analysis of *Thiobacillus ferrooxidans* DNA (M.Sc., 1989).
65. **Salma Muzaffar:** Toxicological effects of bifenthrin on the liver and muscles of chick, *Gallus domesticus* (M.Sc., 1989).

66. **Syed Ata ur Rehman Rizvi:** Effects of aflatoxin in poultry (Ph.D., 1988).
67. **Syed Shahid Ali:** Morphological and biochemical hazards caused by some organochlorinated insecticides on blood and liver of rat (Ph.D., 1989).
68. **Mushtaq A. Saleem:** Toxicological studies on synthetic pyrethroids against red flour beetle *Tribolium castaneum* (Herbst.) (Coleoptera: Tenebrionidae) (Ph. D., 1989).
69. **Shah Bano Mujeeb:** Effects of pyrethroid insecticides on the growth and toxicity of *Bacillus thuringiensis*. (M.Sc., 1990).
70. **Anila Iftikhar:** Effects of thioacetamide, MNNG and heptachlor on the growth and toxicity of *Bacillus thuringiensis*. (M.Sc., 1990).
71. **Mohammadn Mansha:** Analysis and characterization of heat shock proteins in *Bacillus thuringiensis*. (M.Sc., 1990).
72. **Amjad Javed:** Isolation and characterization of plasmids in different bacteria (M.Sc., 1990).
73. **Samira Agha:** Toxic effects of a synthetic pyrethroid on *Tribolium castaneum* larvae. (M.Sc., 1990).
74. **Sofia Noreen:** Electrophoretic evaluation of esterases induced by insecticides in *Tribolium castaneum*. (M.Sc., 1990).
75. **S. Sohail Razal Jaffri:** Toxic effects of a synthetic pyrethroid on a freshwater fish. (M.Sc., 1990).
76. **Farah Anjum:** Effects of heavy metals on drug metabolizing enzymes in rabbits. (Ph.D., 1991).
77. **Naveeda Tufail:** Toxicological effects of synthetic pyrethroids on red flour beetle, *Tribolium castaneum* (Herbst). (Ph.D., 1991).
78. **Namana Gulrukh Bhatti:** Toxicity of Trebon (insecticide) on *Tribolium castaneum*. (M.Sc., 1991).
79. **Saima Tariq:** Induction of heat shock proteins in *Bacillus thuringiensis*. (M.Sc., 1991).
80. **Sameera Rashid:** Isolation and characterization of plasmid from clinically important bacterial isolates from local hospital. (M.Sc., 1991).
81. **Anila Iftikhar:** Isolation and characterization of plasmids of *Bacillus thuringiensis*. (M.Sc., 1991).
82. **Ghazala Yasmeen:** Electrophoretic studies on esterase of chick blood (M.Sc., 1991).
83. **Mohammad Ilyas:** Effect of insecticide (Trebon 30EC) on blood serum proteins of fresh water fish, *Cirrhina mrigala*. (M.Sc., 1991).
84. **Mohammad Younus:** Biochemical analysis of pericardial fluid in chicks of *Gallus domesticus* suffering from hydropericardium syndrome (M.Sc., 1992).
85. **Mohammad Amin:** Toxic effects of cadmium chloride on the haematology of fish *Tilapia mossambica* (M.Sc., 1992).
86. **Munazza Kaukab:** Electrophoretic studies on the total proteins of sporulating and non-sporulating *Bacillus thuringiensis* (M.Sc., 1993).
87. **Sadia Durrani:** Toxic effects of a synthetic pyrethroid on the red flour beetle, *Tribolium castaneum* (M.Sc., 1993).
88. **Fareeha Khaliq:** Studies on esterases of *Tribolium castaneum* (M.Sc., 1993).
89. **Kokab Malik:** Studies on cadmium induced proteins in *Bacillus thuringiensis* (M.Sc., 1993).
90. **Nighat Naheed:** Studies on thermo-induced proteins in freshwater fish (M.Sc., 1993).
91. **Waseem Tufail:** Isolation and characterization of plasmids of antibiotic resistant *Bacillus thuringiensis* (M.Sc., 1993).
92. **Shazia Rab:** Biochemical analysis of pericardial fluid of chicks suffering from hydropericardium syndrome (M.Sc., 1993).
93. **Hamid Raza:** Isolation and characterization of plasmids of antibiotic resistant *Shigella* (M.Sc., 1993).

94. **Waseem Tufail:** Isolation and characterization of plasmids of antibiotic resistant *Bacillus thuringiensis* (M.Sc., 1993).
95. **Dinar Shah:** Biochemical analysis of muscles of farmed and wild freshwater edible fishes (M.Sc., 1994).
96. **Najeeba Ali:** Induction of metallothioneins by lead acetate in *Bacillus thuringiensis* (M.Sc., 1994).
97. **Nargis Riaz:** Effect of synthetic pyrethroid on the growth of *Bacillus thuringiensis* (M.Sc., 1994).
98. **Bushra Khan:** Analysis of esterases during development of malathion resistant and susceptible strains of *Tribolium castaneum* (M.Sc., 1994).
99. **Shabnam Younas:** Analysis of esterases during different developmental stages of FSS II, CTC 12 and PAK strain of *Tribolium castaneum* (M.Sc., 1994).
100. **Hajira Mujib:** Effect of Deltaphos on the esterases of adult beetles of *Tribolium castaneum* (M.Sc., 1995).
101. **Huma Latif:** Effect of Decis-D on the esterases of adult beetles of *Tribolium castaneum* (M.Sc., 1995).
102. **Kanwal Naeem:** Effect of Decis-D on the esterases of sixth instar larvae of *Tribolium castaneum* (M.Sc., 1995).
103. **Nadia Bajwa:** Effect of Deltaphos on the esterases of sixth instar larvae of *Tribolium castaneum* (M.Sc., 1995).
104. **Munazza Makhdoom:** Isolation of chromium resistant bacteria and study of their ability to reduce chromium (M.Sc., 1995), 105. **Naheed Iftikhar:** Isolation of different species of *Bacillus* from soil samples and their evaluation as bioinsecticide (M.Sc., 1995).
105. **Muhammad Amin Shaikh:** Epidemiology of haemorrhagic septicaemia in buffaloes (Ph.D., 1995).
106. **Zafar Iqbal Chaudhary:** Effects of aflatoxicosis on chick muscles, fat and bone growth and possible reversal of aflatoxicosis by nandrolone-decanoate (Ph.D., 1995).
107. **Riaz ul Haq:** A study on the growth and genome organization of *Thiobacillus ferrooxidans* (Ph.D., 1996).
108. **Sajida Rehman:** Osteocalcin gene identification of multiple copies, genomic organization and tissue specific expression (Ph.D., 1996).
109. **Neelum Moizuddin:** Solar induced skin damage and protective effect of anti-oxidants in hairless mice and human volunteers (Ph.D., 1996).
110. **Farah Aziz:** Cell cycle control of human H4 histone gene transcription: contribution of cis, acting elements and coagunate histone nuclear factors. (Ph.D., 1996).
111. **Fauzia Aslam:** Structural and functional analysis of glycocorticoid responsive elements in osteocalcin gene promotor. (Ph.D., 1996).
112. **Farhana Riaz Chaudhry:** Isolation of cadmium tolerant bacteria from industrial effluents. (M.Sc., 1996).
113. **Summra Gill:** Isolation of salt tolerant bacteria from soil samples. (M.Sc., 1996).
114. **Salma Afroz:** Isolation of different species of bacteria from soil samples and their evaluation as bioinsecticides. (M.Sc., 1996).
115. **Faiza Anwar:** Isolation of hydrocarbon degrading bacteria from industrial waste. (M.Sc., 1996).
116. **Shazia Tahseen:** Isolation and characterization of chromium tolerant bacteria from industrial effluents. (M.Sc., 1996).
117. **M. Hamid Rashid:** Purification and characterization of native proteolytically nicked and chemically modified beta glucosidase from *Aspergillus niger* (Ph.D., 1997).

118. **Birjis Zahra:** Isolation and characterization of hydrocarbon degrading bacteria. (M.Sc., 1997).
119. **Asifa Shamim:** Isolation and characterization of yeast for their possible use in cleaning toxic hydrocarbons from environment (M.Sc. 1997).
120. **Zill-i-Huma:** Isolation and characterization of lead resistant yeast from industrial effluents (M.Sc. 1997).
121. **Saeed Anwar:** Isolation of Bacillus species from soil samples and their evaluation as bio-insecticides (M.Sc. 1997).
122. **Asma Choudhary:** Isolation and characterization of insecticide degrading bacteria from soil and industrial effluents (M.Sc. 1997).
123. **Firdaus Kazmi:** Toxicological and biochemical consequences of exposure of the rat to organophosphate pesticides (Ph.D., 1998) (in collaboration with Quaid-i-Azam University, Islamabad)
124. **Bushra Munir:** Isolation and characterization of copper resistant bacteria isolated from the industrial effluents (M.Sc., 1998) 126. **Romana Jamil:** Isolation and characterization of insecticide degrading yeast from soil samples (M.Sc. 1998).
125. **Nazra Jabeen:** Role of lead resistant yeast strains isolated from industrial effluents of tanneries in waste water treatment (M.Sc., 1998).
126. **Saima Munir:** Isolation and characterization of insecticide degrading yeast from soil samples (M.Sc., 1998).
127. **Mamoona Ishaq:** Toxicity of Fenvalerate to different developmental stages of three different strains of *Tribolium castaneum* (M.Sc., 1998).
128. **Mohammad Ashraf Mirza:** Immune responses against bacterial invasion in *Labeo rohita* (Hamilton) (Ph.D., 1999).
129. **Fatima Qureshi:** Isolation of cadmium resistant bacteria from industrial effluents and their use in environmental clean up. (M.Sc. 1999).
130. **Saba Jawed:** Seasonal variation in number and activity of chromium resistant bacteria in industrial effluents. (M.Sc. 1999).
131. **Shaista Jabeen:** Isolation and characterization of cadmium resistant yeast from industrial wastes. (M.Sc. 1999).
132. **Saadia Ismail:** Effect of pyrethroid (Alpha cypermethruin) on esterases of larvae and 10 days old adults of three different strains of *Tribolium castaneum*. (M.Sc. 1999).
133. **Sumble Zulfikar:** Effect of synthetic pyrethroid (Fury) esterases of adults of six different strains of *Rhyzopertha dominica*. (M.Sc. 1999).
134. **Hafsah Nabeel:** Histological changes induced by hexavalent chromium on kidneys of albino mice (M.Phil. 2000).
135. **Amjad Javed:** AML as transcriptional regulator and osteoblast differentiation mediator (Ph.D., 2000).
136. **Khawaja Abdul Mujeeb;** Studies on insecticide resistance in *Tribolium castaneum* (herbst). (Ph.D., 2000).
137. **Qaisera Latif:** Microbiological assessment of drinking water in campus of Punjab University (M.Sc., 2000)..
138. **Shazia Ghafoor:** Isolation and characterization of lead resistant bacteria and their possible use in bioremediation. (M.Sc., 2000).
139. **Humairah Farooq:** Isolation and characterization of mercury resistant yeast and their possible use in biotremediation. (M.Sc., 2000).

140. **Nadia Khalid:** Isolation and characterization of cadmium resistant bacteria and their role in bioremediation. (M.Sc., 2001).
141. **Saba Sattar:** Isolation and characterization of zinc resistant bacteria and their role in bioremediation. (M.Sc., 2001).
142. **Beenish Bashir:** Effect of insecticide on the microsomal esterases of *Tribolium castaneum*. (M.Sc., 2001).
143. **Adeela Tariq Qureshi:** Insecticide resistant yeast and it's role in environmental clean up. (M.Sc., 2001).
144. **Shumyla Sarwar:** Isoaltion and characterization of cadmium resistant yeast and their role in bioremediation. (M.Sc., 2001).
145. **Amir Rafiq:** Isolation and characterization of zinc resistant bat bacteria from industrial effluents and their role in bioremediation. (M.Sc., 2001).
146. **Kiran Khawaja:** Isoaltion and characterization of Nickel resistant bacteria from industrial effluents and their use bioremedation process. (M.Sc., 2001).
147. **Shahid Nadeem:** Bacterial isolates and their improvements for better amino aci d fermentation for glutamine and lysine (Ph.D., 2002).
148. **Khalil Ahmed:** Study on the common bacterial etiological agents of diarrhoea and dysentery in the Northern Area of Pakistan and their sensitivity pattern. (Ph.D., 2002)
149. **Syed Kaleem Zaidi:** Role of interacting proteins in CBF /AML/PEPB2 mediatred gene regulation. (Ph.D., 2002).
150. **Noreen Shakoor:** Metal resistant and metal accumulation efficiency of yeast capable of growing in media containing iron or suklphur (M.Sc., 2002).
151. **Farhan Saboor:** Effect of pH on uptake of heavy metals by lead resistant bacterial isolates and heavy metal precipitation. (M.Sc., 2002).
152. **Farhana Saleem:** Isolation and characterization of nickel resistant yeast from industrial waste and their role in bioremediation of waste water (M.Phil., 2002)
153. **Muhammas Yasir Arafat Khan:** : Isolation and characterization of zinc resistant yeast from industrial waste and their role in bioremediation of waste water (M.Phil., 2002).
154. **Saba Khaliq:** Isolation and characterization of hydrocarbon resistant bacteria (M.Sc., 2003)
155. **Sidra Tauqir:** Isolation and characterization of manganese resistant bacteria and their role in bioremediation. (m.Sc., 2003)
156. **Nazish Mazhar Ali:** The study of bacterial fauna of local honey (M.Phil., 2003)
157. **M. Shehzad:** Isolation and characterization of silver resistant bacteria and their role in environmental clean up (M.Phil., 2003).
158. **Nazia Khurshid :** Studies on the locally isolated strains of *Bacillus* for their possible use as bioinsecticides (Ph.D., 2003)
159. **Ishtiaq Ahmad :** The role of protein modifications by sugars and phosphate in their structure-function behaviour: A computer assisted study in selectins (M.Phil, 2003).
160. **Muhammad Mashhood Ahsan:** Biochemical and haematological abnormalities in human popuylation exposed to hexavalent chromium in effluents of tanneries in industrial area of district Kasur (Ph.D., 2003)

161. **Ali Muhammad:** Toxicological effects of industrial effluents dumped in River Kabul on Mahaseer, *Tor putitora* at Aman Garh Industrial Area , Nowshehra, Peshawar, Pakistan **(Ph.D., 2004)**
162. **Samina Qamar:** Biochemical analysis of honey with particular reference to the variety of free amino acids from *Zizyphus jujoba* **(Ph.D., 2004)**
163. **Nadia Dar:** Studies on yeast strains isolated from industrial areas of Pakistan for detoxification of heavy metals **(Ph.D., 2004)** 166. **Zulfikar Ali Saqib :**Studies on insecticide degrading bacteria **(Ph.D., 2004)**
164. **Jahanzaib:** Diagnosis and prevalence of *Trypanosoma evansi* in camels through polymerase chain reaction and haematocrit centrifugation technique in Punjab (Pakistan) **(M.Sc. Hons Pathology, 2005)**
165. **Muhammmad Asif Muieed:** Comparative studies on the sensitivity of polymerase chain reaction and microscopic examination for the detection of *Trypanosoma evansi* in horses **(M.Sc. Hons. Pathology, 2005)**
166. **Rana Sajjad Ahmed:** Detection of *Toxoplasma gondii* infection in butchers and buffaloes by polymerase chain reaction and latex agglutination test **(M.Sc. Pathology, 2005)**
167. **Muzna Raza:** Studies on association of TNF-alpha with obesity. **(M.Sc., Microbiology & Molecular Genetics, 2005)**
168. **Muhammad Bilal:** Molecular epidemiology of bovine tuberculosis in humans **(M. Phil. Pathology, 2005)**
169. **Sumbal Nazir:** Isolation, characterization and screening of *Bacillus thuringiensis* positive for Cry9 gene **(M.Phil. GCU, 2005)**
170. **Muhammad Suleman:** Molecular detection of *Babesia bigemina* and *Babesia bovis* in carrier cattle by duplex polymerase chain reaction (PCR) **(M. Phil. Pathology, 2006)**
171. **Muhammad Younus Rana:** Pathogenesis of Salmonellosis with respect to carrier status in poultry and its public health impact. **(Ph.D. Pathology, 2006)**
172. **Muhammads Usman Rashid:** Hereditary breast and/or ovarian cancer in Pakistan: Identification of genetic and non genetic risk factors. **(Ph.D., 2006)**
173. **Aftab Ahmad Chatta:** Overexpression and purification of Hepatitis B surface antigen PreS region from *E. coli* **(B.Sc. Hons Microbiology & Molecular Genetics, 2006)**
174. **Asma Hina:** Expression of recombinant Pre-S hepatitis B virus protein using NHB3 clone in *E. coli* expression system **(B.Sc. Hons Microbiology & Molecular Genetics, 2006)**
175. **Farah Bashir:** Isolation and characterization of cadmium resistant bacteria from effluents of Kasur tanneries and Kot Lakhpat industrial area **(M.Sc. Microbiology & Molecular Genetics, 2006)**
176. **Saadia Ashraf :** Molecular characterization of capsular protein gene of *Pasteurella multocida* isolated from different localities in Pakistan **(M.Sc. Microbiology & Molecular Genetics, 2006)**
177. **Shumaila Sanam:** Characterization of *ACR2* gene responsible for arsenic resistance in yeast isolated from industrial effluents of Kasur tanneries **(M.Sc. Biochemistry, 2006)**
178. **Hina Pervaiz Mir :** Characterization of *arsA*, *arsB* and *arsC* genes responsible for arsenic resistance in bacteria isolated from industrial effluents of Kot Lakhpat **(M.Sc. Biochemistry, 2006)**
179. **Muhammad Suleman:** Molecular detection of *Babesia bigemina* and *Babesia bovis* in carrier cattle by duplex polymerase chain reaction (PCR) **(M.Phil. Pathology, 2006)**

180. **Bushra Muneer:** Role of microorganisms in remediation of heavy metals in industrial wastes (Ph.D., 2006).
181. **Abdul Rehman:** Survey of Protozoan fauna surviving in stress conditions in industrial wastes and their role in bioremediation (Ph.D. 2006)
182. **Abdul Razzaq:** Standardization of avian leucosis diagnostic technique through polymerase chain reaction (PCR) and confirmation with enzyme labeled immunosorbent assay (ELISA) (M.Phil. Pathology, 2006)
183. **Kiran Akhtar:** Screening and subscreening of *Bacillus thuringiensis* for cry1 gene (M.Phil. GCU, 2007)
184. **Shahzad Waheed:** Isolation of megaplasmids and determination of antibiotic resistance gene in *Bacillus thuringiensis* (M.Phil. GCU, 2007)
185. **Neelum Aftab:** Analysis of a sequence variation 713-8delC of transforming growth factor Beta1 (TGF β 1) gene in local osteoporotic female population in relation to bone mineral density (B.Sc. MMG, 2007)
186. **Razia Tasadduq:** Association between rs 235768 variation in bone morphogenetic protein 2 (bmp2) gene and bone mineral density in local osteoporotic female population (B.Sc. Hons. MMG, 2007)
187. **Yusra Saheed:** Association between an SP1 binding site polymorphism in Col1A1 gene and bone mineral density in local osteoporotic female population (B.Sc. Hons. MMG, 2007)
188. **Raheela Akhtar Durani :** Comparative study on the sensitivity of polymerase chain reaction (PCR) and conventional serological methods for the diagnosis of brucellosis in ruminants (M.Phil Pathology, 2007)
189. **Naima Mumtaz:** Comparison of multiplex PCR and conventional methods for the diagnosis of Tuberculosis (TBN) in human, buffalo and cattle in Lahore District. (M.Phil. Pathology, 2007)
190. **Muhammad Karim:** A study of PCR based detection of cry11 gene from locally isolated strains of *Bacillus thuringiensis* (M.Sc. Zoology, 2007)
191. **Asadullah Khan:** Standardization of tuberculin test in buffaloes and subsequent detection of Mycobacterium in milk and blood through polymerase chain reaction (M.Phil. Pathology, 2007)
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E. LIST OF SOME ABSTRACTS

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