

CURRICULUM VITAE



Romana Tabassum (Ph. D)

Deputy Chief Scientist

Adjunct Professor (PIEAS), Islamabad

Group Leader Fermentation Technology

Industrial biotechnology Division, National Institute for Biotechnology and Genetic Engineering (NIBGE) P.O. Box 577, Faisalabad.

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Father's Name: Ghulam Ahmed

Domicile/Nationality: Faisalabad (Pakistan)/Pakistani

Present Address: H. No. 276, St. No. 5 Gurnanakpura Faisalabad, Pakistan

Field of Specialization: Microbiology/Biotechnology/Molecular Biology

Experience:

- i) **Deputy Chief Scientist** Dec. 2012 to date
- ii) **Principal Scientists** Dec. 2001 to Nov. 20012
- iii) **Senior Scientific Officer** Dec. 1993 Nov. 2001.

- iv) **Scientific Officer** Dec. 1988 to Dec. 1993
- v) **Assistant Scientific Officer** Jan. 20, 1986 to Nov. 1988
- vi) **Research Fellow** June 26, 1984 to Jan 19, 1986

Education:

Postdoc Fellow. (Molecular Biology/ Biological Systems Engineering) Dept.of Biological Systems Engineering, Virginia State University, Blacksburg , Virginia. (2007-2008)

Ph.D (Molecular Biology)

Quaid-I-Azam University, Islamabad

(Notification 2000)

M.Sc (Microbiology)

University of Agriculture, Faisalabad

(1982)

B.Sc (Chemistry, Zoology and Botany)

Govt. College for Boys, Faisalabad, an affiliate college of Punjab University, Lahore, Pakistan.

(1979)

F.Sc Pre-medical ,

Govt. College for Women, Faisalabad, an affiliated college of Board of intermediate and Secondary Education, Sargodha.

(1976)

Metric: Science subject.

Govt. M.C. High School, Faisalabad, an affiliated college of Board of intermediate and Secondary Education, Sargodha.

(1973)

M.Sc. Thesis: β -haemolysin Production by *Staphylococcus aureus* strains isolated from different sources. Dept of Microbiology, University of Agriculture Faisalabad.

Ph.D. Thesis: DNA-binding proteins and genome topology of thermophilic *Methanobacterium thermoautotrophicum* Δ H strain. Dept. Of Biological Sciences, Quaid-I-Azam Univesity, Islamabad./ Ohio State University USA

Postdoctoral Fellow : Directed evolution of enzyme and Mass transfer of oxygen for enzyme production.

Dept. of Biological Systems Engineering Polytech Institute and Virginia State, University USA, 2007-2008

Scholarships and Merits:

- 1) A Merit scholarship was awarded by “Board of Intermediate and Secondary Education, Sargodha.” on the basis of marks obtained in F.Sc examination (1978).
- 2) A Merit scholarship was awarded by the “University of the Punjab, Lahore” on the basis of marks obtained in B.Sc examination (1989).
- 3) A Ph. D training Scholarship offered by the United States Agency for International Development (USAID).
- 4) A fellowship awarded by PAEC\ KFK bilateral agreement for Federal Republic Germany.
- 5) Awarded merit post doctoral fellowship by Higher Education commission Islamabad_ (2007-2008)

Technical Knowledge:

*Techniques of Microbiology, Biotechnology/Molecular Biology. Isolation, identification and characterization of aerobic and anaerobic organisms by microscopic, biochemical and molecular biology methods. Isolation and identification of pathogenic *Staphylococcus aureus* strains and production of beta haemolysin toxin.

*Anaerobic Microbiology and fermentation. Isolation of anaerobic cellulolytic and solvent producing *Clostridium* strains. Isolation, identification and characterization of anaerobic methane producing species such as *Methanosarcinia mazei*, *Methanosarcinia barkeri*,

Methanococcus voltae, *Methanococcus formicicum*, *Methanobacterium thermoautotrophicum* etc.

*Anaerobic fermentation for production of solvents and biogas. Methanogenesis of agroindustrial wastes.

*Chromatographic techniques for separation of organic acids, sugars and gases by HPLC and Gas chromatography. Anaerobic fermentation of freshwater sediments for the production of methane gas.

*Batch and continuous fermentation experiments for enhanced production of beta-glucosidase from anaerobic cellulolytic indigenous *Clostridium* strain.

*Production, characterization and kinetic of industrially used enzymes. Enzyme assays, Enzyme kinetics, Enzyme purification. Enzyme thermodynamics. Zymographic techniques.

*Experience of all techniques used in Molecular Biology for DNA isolation, purification procedures, gel electrophoresis and methods to analyse protein-DNA interactions to study the genome topology. Manual Sequencing of DNA, Primer designing,

I have successfully cloned, sequenced DNA-binding proteins genes from *Methanobacterium thermoautotrophicum* strain, and expressed cloned proteins in *E.coli*. DNA topology assay to analyse specific protein-DNA interactions and protein purification procedures. All kinds of electrophoresis for separation of protein and DNA. Determination of molecular weights of proteins by electrophoresis and HPLC. The two cloned genes sequences are submitted in Gen Bank under the accession number M86662 HMT1 1120bp, M86663 HMT2 457bp.

* 16sRNA techniques for identification of indigenous *Bacillus* strains.

* Cloning and expression of alpha- amylase and protease gene from indigenous *Bacillus* and expression into *E.coli*.

* Cloning and expression of alpha amylase into *E.coli* yeast *Pichia pastoris* for hyper production of alpha amylase enzyme.

* Cloning and expression of Beta- glucosidase gene in to pUC19 and pET Vectors.

* Error prone and gene shuffling techniques for improvement of enzyme characteristics.

*Gene blast method for homology of DNA and protein, Primary and Secondary structure of genes.

*Ras Win method for 3-D structure determination.

*Pilot plant production of methane from agricultural biomass and sugar industry waste.

*Pilot plant production of alpha-amylase.

*Mass transfer of oxygen on enzyme production.

*Directed evolution of cellulase enzyme by error-prone PCR and gene shuffling techniques.

Research Interests:

*Isolation and Identification of Microbial strains by molecular methods.

* Biomethanation of agro-industrial wastes for bioenergy production.

* Anaerobic fermentation for the production of biofuel

* Molecular biology of methane production.

* Production and characterization of enzymes involved in biofuel production.

* Production and characterization of enzymes involved in textile, food and detergent industry.

* Molecular Biology of alpha amylase and protease production.

* Expression of alpha amylase gene into prokaryotes and eukaryotes.

* Directed evolution of enzymes using error prone PCR and Gene shuffling techniques.

* Downstream and upstream processing of enzyme.

* DNA binding proteins and genome topology.

* Isolation and Identification of Microbial strains by molecular methods.

* Biomethanation of agro-industrial wastes.

* Anaerobic fermentation for the production of bio fuels.

* Molecular biology of methane production.

* Production and characterization of enzymes involved in biofuel production.

* Production and characterization of enzymes involved in textile, food and detergent industry.

- * Molecular Biology of alpha amylase, protease and beta glucosidase production.
- * Expression of alpha amylase and protease genes into prokaryotes and eukaryotes.
- * Directed evolution of enzymes using error prone PCR and Gene shuffling techniques.
- * Process development for vinegar
- * Downstream and upstream processing of industrial enzyme.
- * DNA binding proteins and genome topology.
- * Pilot plant production of methane gas from agricultural and industrial wastes.

Research Productivity Allowance:

Awarded research productivity allowance by Ministry of Science and Technology, Pakistan

Achievements:

1. Histones are small, positively charged proteins that organize DNA into nucleosomes, the simplest level of organization found in chromosomes. Archaeal histones are found in Archaea, prokaryotes comprising the third phylogenetic Domain of Life. Histones are also found in eukaryotes.

I have successfully cloned, sequenced three DNA-binding proteins genes from thermophilic methanogenic strain *Methanobacterium thermoautotrophicum* ΔH strain and expressed these cloned proteins in *E.coli*. The three cloned genes sequences have been submitted in international Gen Bank under the accession number M86662 HMT1 1120bp, M86663 HMT2 457bp and HMT3 1696 Genome topology assay was done to analyze specific protein-DNA interactions to study the positive and negative super coiling of DNA Protein purification of DNA binding procedures has been developed. The work was published in Journal of Bacteriology 1992, vol 174, No 24, p7890-7895.

The work was published in Archaeal Histones Database

Websites: www.biosci.ohio-state.edu/~microbio/Archealhistones

I have discovered HMT1, HMT2 and HMT3 archaeal histones small DNA binding from *Methanobacterium thermoautotrophicum* Δ strain that are prokaryotic homologs of eukaryal histones that wrap chromosomal DNA into nucleosomes and assemble chromatin in all Eukarya.

2. Mixed anaerobic bacterial consortium was provided to Habib Sugar Mills, Nawab Shah, Sindh, Pakistan for production of methane gas from distillery slop as an energy source. Methane gas first time in Pakistan on industrial scale by using known methane producing syntrophic cocultures and the industry is producing 1360 Million cubic feet methane gas per day from four 300 M³. The industry is saving more than Rs. 15 million per day by converting it into electricity for consumption industry. In our lab studies got more than 100% theoretical yield of methane.
3. Developed inoculums for methane production by isolating, identification and characterization of cellulolytic, acetogenic, syntrophic and methanogenic organisms from different sources. This isolated bacterial consortium worked for biodegradation of agriculture and industrial wastes into methane gas. This inoculums was sold to Habib Sugar Mills, Nawab Shah, Sindh for Rs. 200000/
These anaerobic bacteria have been grown at industrial level first time in Pakistan.
4. Pilot plant production of methane from agricultural biomass fruits vegetables and sugar industry waste.
5. Isolated new anaerobic cellulolytic *Clostridium* strains RT9 from bovine rumen fluid. First time in Pakistan
6. Provided consultancy and sold methane producing cultures to sugar industry.
7. Provided consultancy to ShakarGanj Sugar Mills, Jhang, Pakistan to remove contamination from ethanol plant.
8. Provided consultancy to Sathi Industry, Gakhar Mandi to solve the problem of bacterial contamination in the process of liquefaction
9. Isolated eight mesophilic and thermophilic *Bacillus* alpha amylase producing strains from our indigenous sources. These *Bacillus* strains are characterized by morphological biochemical, microscopically and 16 sRNA techniques.
10. Thermostable alpha-amylase enzyme was produced in batch fermentation in 20 liter fermenter from indigenous *Bacillus* strains for commercialization and use in textile industry. The enzyme was characterized by enzyme kinetic,

thermodynamics studies, effect of metal ions, half life and starch liquefaction experiments. The enzyme was purified by ion exchange, gel filtration chromatography and gel electrophoresis. Thermostable alpha amylase gene was isolated from indigenous *Bacillus* strains and cloned into *E.coli* and *Pichia pastoris* expression vectors. First time in Pakistan. The work is still under progress for hyper expression of alpha amylase gene in *Bacillus* and *Pichia pastoris* expression vectors.

11. Developed Chemical and UV mutants of indigenous *Bacillus* strain for hyper-production of alpha-amylase. These mutant strains produced 2.5 fold increase in enzyme activity. These will be used for large scale production of alpha-amylase for industrial application
12. Work was done for production of alpha-amylase in pilot plant (100L, 1800L) at Ravi Rayon Ltd, Kala Shah Kaku, for commercialization of alpha-amylase in textile industry to use as a desizer.
13. Process was developed for production of alpha amylase in 150 L fermenter by collaboration with ICCI Islamabad. Consultancy was provided to ICCI for designing of 150 L fermentor.
14. Isolated two new *Lactococcus lactis subsp* and *lactis Lactococcus lactis subsp cremoris* strains from raw milk and characterized by the presence of mega plasmids in these strain for cheddar cheese making industry.
15. Seven alpha amylase and protease producing indigenous *Bacillus* strains have identified by Morphological, Biochemical, protein profile and 16sRNA molecular Biological techniques have been identified and submitted in gene bank.
16. The successful trial was made for application of alpha amylase in poultry feed for boilers chicks
17. Submitted two alpha amylase gene sequences and eight 16sRNA *Bacillus* gene sequences of indigenous *Bacillus* isolates to NCBI gene sequence data base under accession number.
18. The two cloned genes sequences are submitted in Gen Bank under the accession number M86662 HMT1 1120bp, M86663 HMT2 457bp of DNA binding protein genes from *Methanobacterium thermoautotrophicum*.
19. Developed Pilot plant production and down stream processing facilities for industrial products including 100 L fermentor 300L fermentor, Water chiller 15 ton, continuous centrifuge 1000L/hour, Ultra filtration units from PTCL funded project.

National Training/ Courses:

- 1) Attended post-graduate training course on use of radiation and radioisotopes in agriculture and biology, held at NIAB in Nov. 1984. 1st first position.
- 2) Attended course on biotechnology and advanced biochemistry, July 3, 1985 to April 4, 1985, NIAB, Faisalabad.
- 3) 8th International Course on Protein structure Function Relationship, Jan 2005.
- 4) HEJ Research Institute of Chemistry, International Centre for Chemical Sciences, University of Karachi. P. 66
- 5) Training course on "Technology Transfer Policy and Industry level perspectives 12-07-06 to 18-07-06, COMSTECH, Islamabad.
- 6) Advanced management course held on from 11-22 May 2009 at Pakistan institute of Engineering and Applied Sciences, (PIEAS) Nilore, Islamabad.

International Training:

- 1) Specialized training on anaerobic fermentation, worked with professor/chairman Gerhard Gottschalk, June 20, 1987 to Oct. 21, 1987 in Department of Microbiology, F.R. Germany, under PAEC/KFK bilateral agreement.
- 2) Specialized training on Molecular Biology of Methanogens Nov. 6, 1990 - Feb. 5, 1992 worked with Prof/ Chairman John N. Reeve in Department of Microbiology, The Ohio State University, Columbus, OH.
- 3) Preshipment and installation training on continuous centrifuge at Lahr, Carl Pedsberg Zentrifugenbau GmbH, Germany from Sep. 19-28, 2005.
- 4) Specialized training on Directed evolution of industrial enzyme improvement Dept of Biological systems Engineering, Virginia Tech. Blacksburg, USA.
- 5) Specialized training on Mass transfer of oxygen for enzyme production. Dept of Biological systems Engineering, Virginia Tech. Blacksburg, USA

Membership:

- 1) American Society for Microbiology from 1992-1993.

- 2) Pakistan Society of Biochemistry from 1994 to-date
- 3) Pakistan Society of Biotechnology to- date

Member Advisory Board:

Pakistan Journal of Life and Social Science, Online: ISSN 2221-7630, Print ISN 1727-4915.

Thesis Work Supervisor:

Supervised several M.Sc, M. Phil and PhD students for research studies.

External Examiner:

Viva-voce Examination of M.Sc and MSc Hons students.

Project Reviewer:

Evaluated project sponsored by PTCL, PSF, HEC and MOST

Gene Discovery Gene Sequences Submitted Under Accession in Gene Bank

Gene Sequences submitted to Gene Bank

♣ DNA binding protein genes from *Methanobacterium thermoautotrophicum*

Three Cloned genes sequences are submitted in Gen Bank under the

1 M86662: HMT1 1120bp, DNA binding protein genes from *Methanobacterium thermoautotrophicum* (1991)

2. Accession Number M86663 HMT2 457bp. DNA binding protein genes from *Methanobacterium thermoautotrophicum* (1991)

Accession Number HMT3

♣ 16S rRNA gene sequences of *Bacillus licheniformis* strains.

1. 16S rRNA *Bacillus licheniformis* strain RTS Accession No.EF644417- 1578 bp (2007).

2. 16S rRNA *Bacillus licheniformis* strain RT7YC Accession No.EF644416-1646 bp (2007)

3. 16S rRNA *Bacillus licheniformis* strain RT7P1 Accession No.EF644415-1432 bp (2007).
4. 16S rRNA *Bacillus licheniformis* RT8 gene Accession No.EF644414-1433 bp (2007).
5. 16S rRNA *Bacillus licheniformis* RT2 Accession No.EF644413- 1424 bp (2007).
6. 16S rRNA *Bacillus licheniformis* RTPE Accession No.EF644418-1564bp (2007).
7. 16S rRNA *Bacillus licheniformis* strain BSP Accession No EF 644419-1478 bp (2007)

♣ ***Bacillus licheniformis* strain RT2 levanase-like gene**

1. Levanase Gene bank Accession No.EF644412- 792 bp (2007)

♣ **Alpha amylase gene sequences of *Bacillus* strains**

1. Alpha amylase gene *Bacillus licheniformis* RTS sequences: EF644410-1536 bp (2007)

Molecular characterization and identification of *Bacillus licheniformis* used for the production of alpha-amylase

2. *Bacillus licheniformis* strain RT7YC alpha-amylase-like EF644411 - 1240 bp (2007)

♣ **16S rRNA sequence of protease producing strains**

1. Accession No BankIt1563396: *Bacillus* strain QRT-23 bp1601 (2012)
2. Accession No *Bacillus* JX535386: *Bacillus* strain QRT-3 1525 bp (2012)

BankIt1575773 *Bacillus* JX985357

♣ **16S rRNA sequence of Acetic acid producing bacteria producing strains**

1. BankIt1564606 *Acetobacter* JX627686 (2012)
2. BankIt1565159 *Pseudomonas* JX661059 (2012)
3. BankIt1565196 *Brevundimonas* JX661060 (2012)

Research Project Submitted and Approved:

- 1) Submitted a research proposal to USAID and approved on “Molecular Biology of Methane Production”.
- 2) Submitted a project to National Commission for Science and Technology on “Anaerobic treatment of sugar industry waste for production of energy in the form of methane gas”
- 3) Submitted a project to International Center for Engineering and Biotechnology (ICGEB), Italy on “Cloning, Characterization and Hyper-expression of alpha-amylase genes from *Bacillus* sp.
- 4) Submitted a research proposal to Pakistan Science Foundation for Technology Development on “Cloning, sequencing and hyper expression of thermostable alpha amylase genes from *Bacillus* sp for industrial application.” approved from first, second and third phase for Rs. 18 million.
- 5) Submitted two projects for Pak-China Collaboration on “Agro-industrial solid waste management and on “Production and commercialization of alpha-amylase for industrial application.”
- 6) Submitted a research proposal to Pakistan Telecommunication Limited on “Production and characterization of thermostable alpha amylase for industrial application for Rs. 30 million.
- 7) Submitted a ALP project to Pakistan Agriculture Research Council On “Solid wastes management for energy production.” for Rs. 5.5 million.
- 8) PC-1 forms submitted to Pakistan Council for Science and Technology, on “Cloning, production and protein engineering of microbial amylases and cellulases for industrial application.” 16 Million.
- 9) TC project submitted to IAEA on “Uses of radioisotopes for genetic manipulation of α - amylase gene and hyper-expression by side directed mutagenesis.” For US \$ one million.
- 10) Submitted PAK-USAID collaborative project on “Expression of thermostable alpha amylase gene into *Pichia pastoris* and *Bacillus* for hyper expression of enzyme” \$7.99 million (2005).
- 11) Prepared Proposal for Development of Biotechpark at Ravi chemical Complex Kala Shah Kaku, Lahore. Rs. 468.62 Million (2006)

- 12) Submitted PAK-USAID collaborative project on “Expression of thermostable alpha amylase gene into *Pichia pastoris* and *Bacillus* for hyper expression of enzyme” \$7.99 million (2006).
- 13) Submitted Proposal for Bioenergy for Production of methane from agricultural Biomass. Rs. 295.454 Million (2006).
- 14) Proposal on production of methane gas from paper pulp industry waste is under process of preparation with FC College and PCSIR Laboratories.

Research Project Completed:

- 1) Production of methane from distillery slops using laboratory developed syntrophic coculture (RS. 200,000) (1996) Project Principal investigator
- 2) Pakistan Science Foundation project “Cloning of raw starch digesting α - amylase from *Bacillus* sp and its expression in *E.coli*. Rs. 12, 80,000. (2004-2008) Project Principal Investigator
- 3) Pakistan Telecommunication Limited Project on “Production and characterization of thermostable alpha- amylase for industrial application for Rs. 29.62 million. (2004-2009) Project Principal investigator

Funded Research Project in progress:

1. PAK-USAID collaborative, Project Principal investigator Rs. 22 Million on Solid waste management for Bioenergy production. (2012-2015)

Collaborative Project with Industry:

1. Collaborative Project Shakargang Mills Limited, Jhang as Project Principal Investigator on Development of Process to control Deterioration of Molasses. (2012-2015)

Research Project Submitted:

1) Production, isolation and evaluation of angiotension converting enzyme inhibitory bioactive peptides from milk and dairy products. Co-Principal investigator, submitted to HEC Rs. 7.6 million.

Collaboration with industry:

Collaboration with Shakarganj sugar Mills Ltd. Jhang, Mitchell's and Packages industry on Biogas production from their industrial wastes and vinegar production. Al Rahmat textile, Faisalabad for Textile enzymes and biogas production

Academic Management:

Experience of teaching to M.Phil and Ph.D Biotechnology courses.

1. General Biotechnology (Ph.D course)
2. Environmental Biotechnology (M.Phil Biotechnology)
3. Techniques in Biotechnology (M.Phil Biotechnology)
4. Recombinant DNA Technology (M.Phil Biotechnology)
5. General Microbiology Course coordinator.
6. Fundamental of Biotechnology

Workshop organized:

- Potential Biotech industry for Entrepreneur in Pakistan held on 18-19 April, 2012

Project Reviewed:

Reviewed several projects for HEC, PSF, PTCL and MOST

Process Developed:

1. Process developed for anaerobic fermentation of agricultural and sugar industry wastes into methane gas with 90% theoretical yields
2. Process developed for anaerobic digestion of fruits and vegetable wastes into methane gas.
3. Process developed for production of alpha amylase in pilot plant.

Group Leader Fermentation Technology Group and incharge fermentation services and facilities.

Services and facilities are provided to NIBGE scientist and students for pilot plant fermentation. Thirty fermentation batches were run for alpha amylase protease, xylansae, *Phicia* yeast, ethanol and *Salmonella typhi* fermentation experiments. Maintenance of fermentor was also done.

Supervision of Instruments:

Gas chromatographs, Bench top centrifuge, Continuous centrifuge machine. 100L/hour, Water Chiller 15 ton, In charge of Fermentation facilities Fermentors 20 L(4), 150L and 300 L, Gel documentation. Ultra filtration Unit, UV Visible spectrophotometer, Protein and DNA Gel electrophoresis. Anaerobic glove box

National Curriculum. for Bioinformatics Higher Education Commission

Member for National Curriculum/Syllabi in Bioinformatics for BS and MS Degree of Program Higher Education Commission (2006)

Convener of Stock verification committee: year 2008-2009

Coordinator of Journal club seminar: year 2008-2012

Participation in National and International Symposium/Workshops and Poster Presented:

- 1) PAEC/KfK Symposium/workshop on Biotechnology in Agriculture and Energy, March 3-7, 1986. Faisalabad, Pakistan
- 2) 13th International Nathiagali Summer College on Physics and Contemporary Needs (Biotechnology 1-7, July 1988). Nathiagali, Pakistan.
- 3) PSTC grantees meeting on "Biomass Production and Conversion, Dec. 13-15, 1989. Hotel Serena, Faisalabad".
- 4) International Symposium on Biotechnology for energy, Dec. 16-21, 1989. Hotel Serena, Faisalabad, Pakistan.
- 5) Symposium on Methane from Biomass May 6, 1991. Antlers Doubletree Hotel, Colorado Springs, CO., USA.
- 6) 13th International Symposium on Biotechnology for Fuels and Chemicals May 6-11, 1991. Antlers Doubletree Hotel, Colorado Springs, CO.
- 7) Second International Symposium on Genetic Engineering and Biotechnology, Jan. 6-9, 1993. Karachi, Pakistan.
- 8) All Pakistan Science Conference. May 16-21, 1992.
- 9) International Symposium on Biotechnology for Sustainable Development, Dec. 15-20, 1993. NIBGE, Faisalabad.
- 10) Workshop on Industrial Biotechnology (WIB) 1994, NIBGE, Faisalabad.
- 11) Second national symposium on analytical and environmental chemistry, Aug.27-31, 1993. Baragali, Abbotabad, Pakistan.
- 12) 4th National Conference, Pakistan Society of Biochemistry and Molecular Biology, April 7-10, 1997, NWFP Agricultural University, Peshawar, Pakistan.
- 13) Second International Biennial Conference of Pakistan Society for Microbiology, 24-26 September, 1997. Bhurban, Pakistan.
- 14) 7^h International Conference, Pakistan Society of Biochemistry and Molecular Biology, April 2-5, 2003, Institute of Biochemistry and Biotechnology, University of Punjab, Lahore- Pakistan.
- 15) Training Course on "Understanding ISO 9001:2000" held at NIBGE on 3rd October 2003.
- 16) 1st Conference Industrial and Environmental Biotechnology, National commission on Biotechnology, conference. 29th September 2004. Best Western Hotel, Islamabad.

- 16) 8th International symposium on Protein structure Function Relationship, Jan 7-10, 2005. HEJ Research Institute of Chemistry, International Centre for Chemical Sciences, University of Karachi. P. 66.
- 17) 8^h Biennial national Conference, Pakistan Society of Biochemistry and Molecular Biology, March 07-09, 2005, Institute of Biochemistry, University of Karachi, Karachi, Pakistan. P. 35
- 18) National Symposium on Biotechnology for Economic Prosperity, National Commission on Biotechnology Nathiagali, July 24-26, 2006 Green Retreat Hotel, Nathiagali.
- 19) International National symposium on Nano-Chemistry: Chemistry, Biochemistry, Molecular Biology and Bioinformatics of Enzymes Sep. 20-21 (2006)
- 20) Attended seminar on New possibilities on LC/MS of Bio Molecular Systems (Ltd).held at Lahore, Jan.16, 2007.
- 21) Attended Seminar on intellectual property law held at NIBGE (Dec.12, 2007).
- 22) Attended Seminar on Quality management and its significance in the present Scenario at NIBGE (Sep 22, 2005) by Mohammad Azim Director DQA, PAEC Head Quarters, Islamabad
- 23) Attended on day symposium on insect genomics: applications and potentials for pest control. (25th March 2009) NIBGE, Faisalabad.
- 24) Delivered lecture on Mass transfer of Oxygen on alpha amylase production. 20 Feb. 2008. Dept of Biological systems Engineering Virginia Tech. Blacksburg, USA.
- 25) Delivered expert lecture on Methanogenesis and Biochemistry, A Renewable biofuel technology opportunities: responding to global energy and challenges. 4th May 2009. Forman Christian College, Lahore.
- 26) Delivered Lecture on Protein sequencing in 8th Course on Modern Techniques in Biotechnology held on April 12-18-2010

- 28) Attended one day conference on “Biotech Cotton in Pakistan; Progress and prospects” held at NIBGE from May 27, 2010
- 27) Attended seminar on Bioenergy systems on 4-08-2010 held at Directorate General of Agricultural water Management Punjab, Lahore
- 28) Attended 1st international conference on value addition and innovation in textiles (COVITEX 2011) held on March 14-15, 2011, National Textile University, Faisalabad
- 29) Delivered lecture on solid waste management for bioenergy production. One day seminar on Trends in Environmental Biotechnology held on 18th April 2011, at NIBGE, Faisalabad.
- 30) Attended 10th International and 22nd National Chemistry Conference 2011 held on 21-22 Nov. Uni. of Agriculture Faisalabad.
- 31) Attended one day Symposium on DNA Barcoding: A promising tool for species identification and biodiversity digitization held on 30th Jan.2012 at NIBGE, Faisalabad.
- 32) Delivered Lecture on Protein sequencing in 10th National training course on Modern Techniques in Biotechnology held on Feb 13-17th -2012, at NIBGE, in Biotechnology held on April 12-18-2010 Faisalabad.
- 33) Attended 9th meeting on Punjab power development board with Secretary Energy, Punjab Mr. Rabnawaz held on 7th February, 2012, at Faisalabad Chamber of Commerce & Industry, Faisalabad.
- 34) Attended Seminar on Developments in the field of Biosciences for Pharmaceuticals, Industry and Academic /Research Institutes. Held on 17th October,2012 arranged by Merck Millipore Biosciences at Serena Hotel, Faisalabad
- 35) Attended conference” Agriculture and Food Security Issues in Global Environmental Perspective” held on 11-13 July 2012. University of Azad Jammu and Kashmir, Rawalakot, Azad Kashmir.
- 36) Attended 1st international symposium on Economic growth through technology transfer held on 31st Jan -1st February, 2013 at NUST, Islamabad. Organized by USAID and HEC Pakistan

- 37) Attended National Seminar Future of Research in Pakistan held on 18th May 2013 HEC, Islamabad.
- 38) Attended International Conference on Biotechnology: Prospect and Challenges in Agriculture, Industry, Health and Environment held on April 22-26, 2013 NIBGE, Faisalabad

List of National and International Publications:

- 1) **Tabassum, R.** and M. Ajmal (1983). Beta-haemolysin production by *Staphylococcus aureus* strains from different sources. *Pak. Vet. J.* **3** (3).
- 2) **Tabassum, R.**, M.I. Rajoka, and K.A. Malik (1986). Anaerobic degradation of cellulose by mixed cultures. Abstracted in PAEC-KfK Symposium/Workshop on Biotechnology in Agriculture and Energy, March 3-7, 1986. NIAB, Faisalabad, Pakistan.
- 3) **Tabassum, R.**, M.I. Rajoka, and K.A. Malik (1989). Production of methane from kallar grass grown on saline sodic lands: Metabolism of carbohydrates, methylated amines and methane precursors during digestion of methane gas. Abstracts Int Symp. Biotechnology for energy. Dec. 16-21, pp 21 Faisalabad Pakistan.
- 4) **Tabassum, R.**, M.I. Rajoka, K.A. Malik and G. Gottschalk (1989). Methanogenesis of methylamines, glycine betaine and carbohydrates by sulfate reducing and methanogenic bacteria in fresh water sediment. Abstracted in Int. Symposium, Biotechnology for Energy Dec. 16-21, 1989, Faisalabad, Pakistan.
- 5) **Tabassum, R.**, M.I. Rajoka, K.A. Malik, and G. Gottschalk (1989). Use of chemostat for enhanced production of β -glucosidase and ethanol by anaerobic mesophilic *Clostridium* strain. Poster abstract *ibid*.
- 6) **Tabassum, R.**, M.I. Rajoka, and K.A. Malik (1988). Anaerobic production of ethanol by mesophilic and thermophilic bacteria. Presented at 13th international Nathiagali Summer College on Physics and Contemporary Needs (Biotechnology 1-7 July 1988). Nathiagali, Pakistan.
- 7) **Tabassum, R.**, M.I. Rajoka and K.A. Malik. (1991). Anaerobic Production of methane from Kallar grass grown on saline sodic lands: Metabolism of carbohydrates, methylated amines and methane precursors during digestion of Kallar grass. *Proc. International Symposium on Biotechnology for Energy* ed. Malik, K.A. (1991) pp. 141-149. (impact factor 1)

- 8) **Tabassum, R.** and M. I. Rajoka (1992) Production of methane from lignocellulosic substrates and molecular biology of biogas production. *All Pakistan Science Conference*. May 16-21, 1992.
- 9) **Tabassum, R.,** K. Sandman and J. N. Reeve. (1993). Cloning and characterization of Histone like DNA binding protein gene (hmt) from *Methanobacterium thermoautotrophicum*. *Proc. Second international symposium on Genetic Engineering and Biotechnology*, Jan. 6-9, 1993. Karachi, Pakistan.P.95.
- 10) **Tabassum, R** and M. I. Rajoka. (1993). Methanogenesis of industrial and agricultural wastes using sewage sludge and bovine rumen fluid as inoculum. *Proc. Second national symposium on analytical and environmental chemistry*, Aug.27-31,1993. Baragali, Abbotabad, Pakistan.
- 11) **Tabassum R.,** M.I. Rajoka and K.A. Malik (1995). Biomethanation of Agroindustrial wastes, abstracted in *International Symposium on Biotechnology for Sustainable Development Dec.15-20, 1993*. p. 166. Faisalabad, Pakistan.
- 12) Rajoka, M.I., **Romana Tabassum**, M. Ahmad, F. Latif, S. Parvez and K. A. Malik (1996). Production of biofuels from renewable biomass. *In: Proceed. Asia-Pacific Solar Experts Meeting*, Dec. 18-21,1995, Islamabad, Pakistan pp.44-67.37.
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- 35) **Romana Tabassum** 2012 Potential of methane production from cotton waste. 1st Biotechnology Dubi conference.
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- 38) Saira Bahir Asifa Afzal, Tanveer Majeed and **Romana Tabassum 2013** Expression of alpha amylase gene from *Bacillus licheniformis* International Conference on Biotechnology: Prospect and Challenges in Agriculture, Industry, Health and Environment held on April 22-26, 2013 NIBGE, Faisalabad
- 39) Asifa Afzal, Saira Bahir, Tanveer Majeed, **Romana Tabassum 2013** Kinetic of subtilisin protease produced from *Bacillus licheniformis* RTS strain. Prospect and Challenges in Agriculture, Industry, Health and Environment held on April 22-26, 2013 NIBGE, Faisalabad
- 40) Tawaf Ali Shah, Tauqir Nasir, Asifa Afzal, **Romana Tabassum** and Rabab Zahra 2013. Isolation of metalobeta bla. NDM.1 Gene containing gram negative bacteria from water in Pakistan. Prospect and Challenges in Agriculture, Industry, Health and Environment held on April 22-26, 2013 NIBGE, Faisalabad

Internees Supervised:

1. Farhat-U-Allah Babar Roll No 14. M.Sc Biotechnology Institute of Biotechnology and Genetic Engineering (IBGE) University of Sindh, Jamshoro, 1st July -30th July
2. Muhammad Irfan, Reg. No. 2005-KUMB-363, Dept. Of Microbiology, Kohat University of Science and Technology (Kohat), Methanogenesis of vegetables and fruit wastes, Industrial Biotechnology Division, 20th June – 20th August, 2009.
3. Three B.Sc(Hons) Shaima, Mr. Ali, Mr. Faheem Dept of Biotechnology, FC, College, Lahore, August 2009.

4. Five B.Sc (Hons) Ramla Ashfaq, Mehwish Nawaz, Qudsia Arooj, Hafiza Madeha Khaliq, M. Usman Iqbal. Dept of Biotechnology, FC College, Lahore, August 2010
5. Muhammad Shahid Riaz, B.Sc (Hons.) Biotechnology Reg. #:2007-FST-8114-UHS, 2007-2012, Faisalabad Institute of Research science and Technology (FIRST).
6. Namra Iftikhar Ahmad, B.Sc (Hons.) Biotechnology, Reg. #:2007-FST-8111-UHS, Session: 2007-2012, Faisalabad Institute of Research science and Technology (FIRST)
7. Muhmmad Sabtain, 2009-2011 (M. Phil) Food Science and Technology, Gomal University, D.I.Khan. Characterization of protease for food application.

M.Sc and M.Sc Hons. Thesis Work Supervised:

1. Methanogenesis of lignocellulosic cotton stalk (*Gossipium hirsutum*) for the production of biogas. Ms Faiza Malik, 1993 submitted to University of Agriculture, Faisalabad for M.Sc degree in Chemistry.
2. Isolation and characterization of anaerobic cellulolytic strains Mr. Mohammad Irshad Submitted to University of Punjab, Lahore. 1994 for M.Sc degree in Zoology.
3. Comparison of pre-sowing seed invigoration treatments in coarse and fine rice. Mohmmad Farooq, 2003 for M. Sc (Hons) degree in Agronomy Department of Agronomy, University of Agriculture, Faisalabad.
4. Development of *Lactococcus lactis subsp. lactis* culture for cheddar cheese preparation (Zarina Mushtaq M.Sc (Hons.) 97-ag-1352 (2004) Food Technology, Institute of Food Science and Technology, University of Agriculture, Faisalabad, Pakistan.
5. Isolation ,identification and Characterization of *Lactococcus lactis subsp cremoris* and its influence on cheddar quality.(Shazia Sarfraz M.Sc (Hons) 97-ag-1347) (2004) Food Technology, Institute of Food Science and Technology, University of Agriculture, Faisalabad, Pakistan.
6. Physiological and biochemical evaluation of seed priming techniques in coarse and fine rice (*Oryza sativa* L.). Muhammad Khalid M.Sc.(Hons.) Agronomy. (2005) Regd. No.99-ag-1355, Univ. of Agriculture Faisalabad.

7. .Effect of carbon and nitrogen source on α -amylase production from *Bacillus licheniformis*. M.Sc, M. Khalid Yaqub.(2005) Regd. No. 2003-ag-404, Department of Chemistry (Biochemistry), Univ. of Agriculture Faisalabad.
8. Purification of α - amylase from *Bacillus* Rehana Malik. M.Sc (2005) Regd. No.2003 GCUF 774-3, Dept. of Chemistry, G.C. Univ. Faisalabad.
9. Thermal inactivation of α -amylase. Mehwish Batool. M.Sc (2005) Regd. M.Sc no.2003 GCUF 754-3, Dept. of Chemistry, G.C. Univ.Faisalabad.
10. Hydrolysis of starch by α -amylase. Samia Batool. M.Sc (2005) Regd.no.2003 GCUF, 761-3,Dept. of Chemistry, G.C. Univ. Faisalabad.
11. Solid state production of α -amylase RTS. Yasmeen Naz. M.Sc (2005)Department of Botany, Reg No: - GCUF-2003-736-3 G.C. Univ. Faisalabad.
12. Solid state production of α -amylase RT₇P₁. Humeira Saleem. MS.c (2005)Department of Botany. Reg No: - GCUF-2003-321-2 G.C. Univ. Faisalabad.
13. Characterization and cloning of protease gene from *Bacillus licheniformis* Asifa Afzal (2007) School of Biological Sciences, Lahore
14. Mesophilic anaerobic digestion of fruits and vegetable wastes with cow dung slurry for production of methane gas. Riffat Batool, M.Sc (2008-2010) Department of environmental Sciences. Reg. 2008-GCUF-1931-330, G.C. Univ. Faisalabad.
15. Mesophilic biogas production from paper wastes and cow dung slurry, Salma Omar, (2008-2010) Reg 2008- GCUF-1932-330, M.Sc, Environmental sciences. , G.C. Univ. Faisalabad.
16. Biomethanation of cow dung and wheat straw slurry under mesophilic conditions. Faiza Anwar Barki, (2008-2010) Reg 2008- GCUF-1956-330, M.Sc, Environmental sciences. G.C. Univ. Faisalabad.
17. Production of biogas from mixture of cow dung slurry and bagasse, Farzana Kausar (2008-2010) 2008-GCUF-1946-330. M.Sc, Environmental sciences. G.C. Univ. Faisalabad.
18. Muhammad Shahid Riaz, B.Sc (Hons.) Biotechnology Reg. #:2007-FST-8114-UHS, 2007-2012, Faisalabad Institute of Research science and Technology (FIRST).

19. Namra Iftikhar Ahmad, B.Sc (Hons.) Biotechnology, Reg. #:2007-FST-8111-UHS, Session: 2007-2012, Faisalabad Institute of Research science and Technology (FIRST)

M.Phil Thesis Work Supervised:

- 1) Production, purification and characterization of alpha amylase from indigenous *Bacillus* sp. Ms. Shazia Khaliq, Submitted to Quaid-I-Azam University, Islamabad. 2003 for M.Phil degree in Biotechnology.
- 2) Mutagenesis of *Bacillus licheniformis* RTS-1 strain for enhanced production of alpha amylase. Ms. Yasmeen Shoukat, Submitted to Quaid-I-Azam University, Islamabad. 2003 for M.Phil degree in Biotechnology.
- 3) Factors effecting on alpha amylase production from *Bacillus licheniformis* RTPE-1 strain Atta-ul- Aleem Submitted to Quaid-I-Azam University, Islamabad. 2005 for M.Phil degree in Biotechnology.
- 4) Molecular characterization of protease gene from indigenous *Bacillus* strain. 2009-2010. Tanveer Majeed Registration Number: 10-6-1-004-2007. Pakistan institute of Engineering and Applied Sciences, (PIEAS) Nilore, Islamabad.
- 5) Methanogenesis of Fruits and Vegetable wastes od Sabzimandi Market. 2009-2010, Mian Nabeel Anwar, Forman Christian College, Lahore.
- 6) Characterization of protease for food application. Muhmmad Sitain, 2009-2011 M. phil Food Science and Technology, Gomal University, D.I.Khan.
- 7) Characterization of serine protease from *Bacillus licheniformis* RTS strain. 2011-2012, Asifa Afzal, M Phil. Biotechnology, Reg. #:2005-GCUF-2787-521 , PIEAS, Islamabad.
- 8) Isolation and characterization of alkaline protease producing bacteria. Saba Qamar 2010-2012, M.S. Biotechnology Rg.# 2005-GCUF-2787-521, G.C. University Faisalabad
- 9) Biological removal of hydrogen sulphide from biogas, Iffat Rasheed, 2010-2012, Qamar Abbas, M phil. Environmental Sciences, 20054-GCUF-642-552, G.C. University Faisalabad

Ph.D Thesis:

- 1) Assesment of physiological Biochemical aspects of presowing seed treatment in transplanted and direct seeded rice. Mohmmad Farooq, 2003 for Ph.D. Reg No. 95-ag-1219, Degree in Agronomy, (Crop Physiology) Department of Agronomy, University of Agriculture, Faisalabad.
- 2) Molecular characterization of alkaline protease from thermophilic *Bacillus licheniformis* strain, Tanveer Majeed, 2010-2013, Reg. No. 10-7-1-061-2011, Biotechnology, PIEAS, Islamabad.
- 3) Characterization of pectinase from *Bacillus*, Nagina Rafique, Ph.D Food Science and Technology, Reg. #:2001-URTB-3143, Session: 20, University of Azad Jammu and Kashmir, Rawalakot, Azad Kashmir.
- 4) Metagenomic of methanogens, Asifa Afzal 10_7_1_072_2013 Biotechnology, PIEAS, Islamabad.
- 5) Enzymatic treatment of lignocellulosic biomass Tauqir Nasir : 10_7_1_077_2013 Biotechnology, PIEAS, Islamabad
- 6) Chemical treatment of solid waste for bioenergy production. Tawaf Ali Shah: 10_7_1_087_2013 Biotechnology, PIEAS, Islamabad
- 7) Anaerobic digestion of waste for bioenergy production, Shehbaz Ali 10_7_1_072_2013 Biotechnology, PIEAS, Islamabad

Letter from Gen Bank to get the accession number for Gene sequences.

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M86662 HMT1 1120 bp

M86663 HMT2 457 bp