

Zahid Hussain, Ph.D.

Assistant Professor of Biotechnology

Institute of Industrial Biotechnology, GC University Lahore, Pakistan

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Google Scholar profile link:

<https://scholar.google.com/citations?user=C4Vcl-oAAAAJ&hl=en>

Cell: +92-3364373053

Objective

To contribute my expertise in biotechnology and research in a teaching and research-friendly environment, with a focus on the development and innovation of biotechnological products.

Education

2003 – 2007

Ph.D. in Biochemistry and Biotechnology

Graz University of Technology (TUG), Graz, Austria

Thesis: Molecular Recruitment of Novel Enzymes from Endophytic Bacteria

1994 – 1996

M.Phil. in Biochemistry

Quaid-e-Azam University, Islamabad, Pakistan

Thesis: Study of Total Lipids and Fatty Acids of Freshwater Fish Species

1992 – 1994

M.Sc. in Biochemistry

Quaid-e-Azam University, Islamabad, Pakistan

1988 – 1991

B.Sc. in Biochemistry

Govt. Degree College, Nowshera, KPK, Pakistan

Majors: Chemistry, Botany, Zoology

Students' Evaluation

Grade A in student evaluations conducted by the Quality Enhancement Cell at GC University Lahore, Pakistan.

Research Projects

- **Production of Bio-energy (Bio-fuel) from Biomass (Collaboration)**

- **Cloning, Expression, Purification, and Characterization of Xylose Isomerase**
- **Improvement of Xylose Isomerase through Random and Site-Directed Mutagenesis**
- **Production of HS Vaccine and NDV**
- **Production of pectinase from Bacteria**
- **Production of pectinase from bacteria**
- **Improving the thermostability and enzyme activity of Esterase**
- **Development of the kit for meat adulteration**

Research Experience

- **M.Phil. Studies:** 2.5 years
- **Ph.D. Studies:** 3.5 years
- **Post-Ph.D. Teaching and Research:** 17 years

Accomplished Research Work

- Altered the activity of Esterase to Hydroxyl Nitrile Lyase through Random Mutagenesis
- Enhanced Thermo-stability of Esterase
- Conducted Site-Directed Mutagenesis on Desired Amino Acids
- Cloning and Characterization of Industrially Relevant Enzymes (Endoglucanases, Cellobiohydrolases, Xylosidases, Endoxylanases, Esterases, Hydroxynitrile Lyases, Lipases, RNases, Glucosidases)
- Analysis of Antibacterial, Antifungal, and Anticancer Activities of Various Compounds
- Design of Novel Antiviral Oligopeptides
- Metabolic and Protein Engineering
- Vaccine Development
- Enzyme improvement through random mutagenesis
- Directed mutagenesis of Nitrogen Fixing Endophytic Bacteria

Employment History

2019 – Present

Assistant Professor, Institute of Industrial Biotechnology, GC University Lahore

2016 – 2019

Associate Professor (TTS), Institute of Industrial Biotechnology, GC University Lahore

2008 – 2016

Assistant Professor, Institute of Industrial Biotechnology, GC University Lahore

Feb 1998 – July 2003

Visiting Faculty, International Islamic University Islamabad

June 1996 – Feb 2008

Lecturer of Biology, IMCB Islamabad

Consultant, Diagnostic Center

Research and Creative Accomplishments

- **NCBI Accession Numbers:** FN563833.1, FN563427.1, FN562417.1, FN563968.1

Courses Taught

- Medical Biotechnology
- Molecular Biology
- Biochemistry
- Enzymology
- Microbial Enzyme Technology
- Recombinant DNA Technology
- Molecular Immunology
- Biotechnology Techniques
- Virology
- Forensic Science
- Molecular Diagnostics
- Drug Design and Delivery
- Protein Purification

Duties Performed

1. **Class Teacher**
2. **Assistant Controller of Examinations**
3. **M.Phil Class Co-ordinator**
4. **Ph.D. Co-Ordinator**
5. **Incharge Chemicals**
6. **Member Purchase Committee**
7. **Member Admission Committee**
8. **Member Board of Studies**
9. **Paper Setter**
10. **Paper Evaluator**
11. **B.Sc. Programme Co-ordinator**
12. **Sports Co-ordinator**
13. **House Master**
14. **Ph.D. Thesis External Examiner**
15. **M.Phil Research Supervisor**
16. **Ph.D. Research Supervisor**
17. **Practical Demonstrator**
18. **External Paper Setter**
19. **Member Research Evaluation Committee**
20. **Member Cricket Team Selection Committee**
21. **Reviewer of Research Papers**
22. **Member Class Check Committee**
23. **Focal Person for External Links**
24. **Member B.Sc. (Biotechnology) Curriculum Development Committee**
25. **Member B.Sc. (Microbiology) Curriculum Development Committee**
26. **Member M.Phil. (Biotechnology) Curriculum Development Committee**

- 27. Member M.Phil. (Microbiology) Curriculum Development Committee**
- 28. Member Ph.D. (Biotechnology) Curriculum Development Committee**
- 29. Member Ph.D. (Microbiology) Curriculum Development Committee**

Courses Developed

- 1. Immunology**
- 2. Recombinant DNA Technology**
- 3. Forensic Science**
- 4. Molecular Biology**
- 5. Molecular Immunology**
- 6. Applications of Recombinant DNA Technology**
- 7. Principles of Molecular Biology**
- 8. Drug Design and Delivery**
- 9. Molecular Diagnostics**
- 10. Enzymology**
- 11. Principles of Enzymology**
- 12. Protein Purification**
- 13. Virology**
- 14. Vaccines**

Worked As Reviewers for the Research Journals

- 1. LGU Journal of Life Sciences**
- 2. Brazillian Journal of Microbiology**
- 3. The Journal of Microbiology and Molecular Genetics**

4. Pakistan University Journal of Zoology

Member Advisory Board

1. Pakistan University Journal of Zoology

Publications

Publications in “W” category Journals

Publications in Journals with Impact Factor

S r. #	Title of Research paper	Journal	Yea rs	Page No.	Imp act Fact or	ISI Recogn ized
1	Characterization of Two Bacterial Hydroxynitrile Lyases with High Similarity to Cupin Super-family Proteins. Zahid Hussain , Romana Wiedner , Kerstin Steiner , Tanja Hajek , Manuela Avi , Bianca Hecher , Angela Sessitsch and Helmut Schwab	Applied Environmental Microbiology Print ISSN: 0099-2240; Online ISSN: 1098-5336.	2012	78(6): 2053-2055.	3.952	Yes

3	Cloning, characterization and molecular docking of a highly thermostable β-1,4-glucosidase from <i>Thermotogapetrophila</i>. IkramUlHaq, Mahmood Ali Khan, Bushra Muneer, Zahid Hussain, SumraAfzal, Sana Majeed, Naeem Rashid, Muhammad MohsinJaved.	Biotechnoogy Letters. ISSN: 0141-5492 (Print) 1573-6776 (Online)	2012	34(9): 1703-1709.	1.639	Yes
4	Kinetic and thermodynamic study of cloned thermostable endo-1,4-β-xylanase from <i>Thermotogapetrophila</i> in mesophilic host. Authors: Ikram-ul-Haq, Hussain Z, Khan MA, Muneer B, Afzal S, Majeed S, Akram F.	<i>Molecular Biology Reports</i> ISSN: 0301-4851 (Print) 1573-4978 (Online)	2012	39(7) 7251-7261	2.024	Yes
5	Synthesis, structural characteristics and antimicrobial 1 activities of new 2 organotin (IV) 3-(4-bromophenyl)-2-ethylacrylates. NIAZ MUHAMMAD, ZIA-UR-REHMAN, SHAUKAT SHUJAH, AFZAL SHAH, SAQIB ALI, AUKE MEETSMA and ZAHID HUSSAIN.	<i>Journal of Coordination Chemistry</i>, ISSN 0095-8972 (Print),	2012	65 (21): 3766-3775	2.2	Yes
6	Homobimetallicorganotin (IV) complexes with hexadentate Schiff base: Synthesis, crystal structure and antimicrobial studies. ShaukatShujah, Zia-ur-Rehman, Niaz Muhammad, Afzal Shah, Saqib Ali, AukeMeetsma, Zahid Hussain	Journal of Organometallic Chemistry ISSN: 0022-328X	2014	759 (1): 19-26.	2.1	Yes

7	Xylose isomerases from <i>Thermotogales</i>. Bilqees Fatima, Zahid Hussain.	<i>Journal of Animal and Plant Sciences</i> ISSN: 1018-7081	2015	25(1): 10-18	0.25	Yes
8	Evaluation of efficacy of killed and commercially available live new castle disease vaccine in broiler chicken in Pakistan. Ali, M.; Muneer, B., Zahid Hussain.; Rehmani, S. F.; Yaqub, Tahir; Naeem, M.	<i>Journal of Animal and Plant Sciences</i> ISSN: 1018-7081	2014	24(6):1663-1667	0.25	Yes
9	Thermodynamic and saccharification analysis of cloned GH12 endo-1,4-β-glucanase from <i>Thermotogapetrophila</i> in a mesophilic host, 22(9): 785 - 794 Ikramul Haq, Bushra Muneer, Zahid Hussain, Mahmood A. han, Sumra Afzal, Sana Majeed, Fatima Akram and SairaAkmal. 2015	<i>protein and peptide letters</i> ISSN: 1875-5305 (Online) ISSN: 0929-8665 (Print)	2015	22(9): 785 - 794	1.735	Yes
10	CenC, a multidomainthermostable GH9 processiveendoglucanase from <i>Clostridium thermocellum</i>: cloning, characterization and saccharification studies IkramulHaq, Fatima Akram, Mahmood Ali Khan, ZahidHussain, Ali Nawaz, KaleemIqbal& Ali Javed Shah, 2015	World Journal of Microbiology and Biotechnology ISSN: 0959-3993 (print version)	2015	31:1699–1710	1.39	Yes
11	Cloning with kinetic and thermodynamic insight of a novelhyper	<i>Journal of Molecular</i>	2015	124 (2016) 92–104	2.128	Yes

	thermostable glucosidase from Thermotoga naphthophila 10T with excellent glucose tolerance Fatima Akram, IkramulHaq*, Mahmood Ali Khan, Zahid Hussain , Hamid Mukhtar, Kaleem Iqbal Institute	<i>Catalysis B: Enzymatic</i> , <i>ISSN:</i> 1381-1177				
1 2	Mutations in Human Interferon $\alpha 2b$ Gene and Potential as Risk Factor Associated with Female Breast Cancer Fayyaz Ahmed, 1 Nasir Mahmood, 2 Saman Shahid, 3 Zahid Hussain , 1 Ishtiaq Ahmed, 1 Amir Jalal, 4 Bushra Ijaz, 5 Abubaker Shahid, 6 Ghulam Mujtaba, 6 and Tanveer Mustafa 7	CANCER BIOTHERAPY AND RADIOPHARMACEUTICALS <i>ISSN:</i> 1084-9785	2016	31(6): 2016 Pp#199-208	1.738	Yes
1 3	Antimicrobial And Antiurease Potential Of Diorganotin(IV) Schiff Bases Shuja Abbas Khan, Rehan Naeem, Shah Hussain, Saqib Ali, Naveed Muhammad, Zahid Hussain , Shaukat Shujah	Pakistan Journal of Pharmaceutical Sciences	2017	Pages 00	0.68	yes
1 4	Purification and characterization of an extracellular T2 family Ribonuclease (RNase) from Bacillus megaterium NRRL 3712. Akram F¹ , Haq IU¹ , Hussain Zahid¹ , Rashid S¹ .	<i>protein and peptide letters</i> <i>ISSN:</i> 1875-5305 (Online) <i>ISSN:</i> 0929-8665 (Print)	2018		1.03	yes

15	Lignin linked to slow biodegradability of urea-crosslinked starch in an anaerobic soil environment Zahid Majeed, Nurlidia Mansor, Zainab Ajab, Zakaria Man, Ariyanti Sarwano, Basharat Ahmad, Zahid Hussain	<i>E- Polymer</i>	2018		1.1	yes
16	Cutaneous Leishmaniasis in the Metropolitan City of Multan, Pakistan, a Neglected Tropical Disease. J Med Entomol 2018. Ayaz MM, Nazir MM, Ullah N, Zaman A, Akbar A, Zeeshan and Zahid Hussain	<i>Journal of Medical Entomology</i>	2018	1040-1042	1.6	yes
17	Delivery of biological products (Review article). Madeeha Ahmed, Zahid Hussain	<i>International Journal of pharmaceutical review and research.</i>	2013	36: 191-198.		
18	Establishment of physical environment in solid state fermentation for the production of glucoamylase using Box-Behnken design. Bilqees Fatima, Mahmood Ali Khan, Zahid Hussain.	<i>Malaysian Journal of Microbiology</i>	2014	10(4): 262-272		
19	Important Sources and Medicinal Applications of L-Aparaginase. Hassan Mustafa Arif, Zahid Hussain.	International Journal of Pharma Research and Review.	2014	3(6): 35-45.		

20	Optimized production of lipase from <i>Bacillus subtilis</i> PCSIRNL-39 Haniya Mazhar, Naaz Abbas, Sakhawat Ali, Amir Sohail, Zahid Hussain , Syed Shahid Ali	African Journal of Biotechnology	2017	Vol.16(19), pp. 1106-1115		
21	Meat Species Identification: Amplification Refractory Mutation System-Polymerase Chain Reaction–Based Assay · Muhammad Waqas , Zahid I. Hussain , Awais Ihsan	<i>Food Analytical Methods</i>	2019	Volume 12, Issue 12 , pp 2813–2822	2.7	
22	Production and characterization of a thermostable extracellular esterase from <i>Aspergillus niger</i> Hamid, A., Hussain, Z., Tayyab, M., Zafar, A., Nawaz, M., Ali, S., Rehman, A., & Aftab, M.	<i>Revista Mexicana De Ingeniería Química</i>	2021	20(2), 839-852.	2.1	
23	Enrichment and Characterization of Hydrocarbon Degrading Bacteria from Various Oil-Contaminated Sites in Pakistan Amna Aqeel , Zahid Hussain , Qurat-Ul-Ain Aqeel , Javaria Zafar , Naureen Ehsan , Mahnoor Tariq	<i>Geomicrobiology journal</i>	2021	Pages 577-587	1.97	

2 4	<i>Chlamydia trachomatis</i> core genome data mining for promising novel drug targets and chimeric vaccine candidates identification IMuneeba Aslam, ^aMuhammad Shehroz^b, FawadAli^aAsadZia^aSadiaPervaiz^cMohibullah Shah, ^cZahidHussain^dUmarNishan^eAqalZaman^fSahib GulAfridi^aAsifullahKhan^a	Computers in Biology and Medicine	2021	Volume 136 , Sep tember 2021,	3.43	
2 5	Exploring catalytic degradation of environmental fenamiphos by yeast enolase cross-linked with COOH-functionalized silver nanoparticles Sikander Ali,^{*a} Rabab Maqsood, ^a Muhammad Usman Ahmad,^a Ishtiaq Ahmad,^a Zahid Hussain,^a Ammar Naveed,^a Muhammad Ammar Javed, ^{*d} Aqsa Zahid,^a Muhammad Nauman Aftab,^a Baber Ali, ^b Humaira Rizwana^c and Mohamed Soliman Elshikh^c	Environ. Sci.: Nano,	2024,		7.3	

Annexure-I B

Publications in “X” Category Journals

Publications in Non-referred Journals

Title of publication	Name of Journal	Year of Publication	Page Number
26. Efficacy of experimentally prepared oil-based new castle disease (ND) vaccine (Mukteswar strain) against prevailing virulent ND virus in Punjab, Pakistan. Sajjad Ali, Zahid Hussain , Sajjad Hussain, Aisha Khatoon, Zainul Abidin, Sobia Aamir and Abdul Whab Manzoor.	International Journal of Innovative and Applied Research,	2014	2(6): 45-53.
27. Prevalence of <i>Mycobacterium tuberculosis</i> Beijing strains in Punjab Pakistan. Hassan Mustafa Arif and Zahid Hussain .	<i>Inter. J. of Curr. Res. and Aca. Rev.</i>	2014.	2(6):74-82
28. Utilization of agro-industrial waste residues for the production of amylase from <i>Aspergillusoryzae</i> IIB-6. Bilqees Fatima, Zahid Hussain and Mahmood Ali Khan.	<i>British Biotechnology Journal.</i>	2014	4(4): 350-365.
29. Role of NLR proteins in immunity.	<i>International Journal of</i>	2014	2(4):48-53.

HinaAfroz, Zahid Hussain , Maria Azam, MaqsoodArif and RehanRafique.	<i>Microbiology and Immunology Research.</i>		
30. Production and Partial Characterization of Lipase from Pseudomonas putida. Huda Fatima[*], Natasha Khan, Asad Ur Rehman and Zahid Hussain	Fermentation Technology	2015	2:112. 10.4172/2167-7972.
31. Ebola Virus, Its Manifestations and Reported Therapeutic Strategies Aminah Suhail Qureshi* and Zahid Hussain	International Journal of Current Research in Biosciences and Plant Biology	2016	3(3): 12-20
32. Purification and Characterization of Lipase Production from Bacillus subtilis PCSIR-NI39 HaniyaMazhar, *Naaz Abbas, **Syed Shahid``Ali, Zahid Hussain and *Sakhawat Ali	J. Biol. Chem. Research.	2016	Vol. 33, No. 1: 547-558,
33. A Review on the Role of Fermented Foods as Health Promoters Fatima Asghar, Sikander Ali, Anum Goraya, Ifrah Javaid, Zahid Hussain	Int. journal of Scientific Research in Science and Technology	2017	(2)4: 141-148
34. BIOSYNTHESIS, PARTIAL PURIFICATION AND CHARACTERIZATION OF EXTRACELLULAR L-ASPARAGINASE FROM NOVEL BACILLUS SUBTILIS SUBSP. SPIZIZENII TU-B-10 ISOLATED FROM GCU GARDEN SOIL MICROFLORA	<i>Biological and Clinical Sciences Research Journal,</i>	2023	(1), 447.

FATIMA, H., HUSSAIN, Z., SALEEM, R., SHAIKH, Z., SIYAL, S., JOKHIO, S., UNAR, A., UNAR, K., SHAIKH, S., SHAIKH, A., & SIYAL, F. (2023).			
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30. **Isolation and Molecular Characterization of Novel Nitrogen-Fixing Bacteria from Wheat: Implications for Sustainable Agriculture and Ammonia Production**

Wajeeha Nawaz, **Zahid Hussain**, Tooba ume Habiba, Fatima Asghar

Publication date

2025/8/5 Publisher Preprints

Publications in “Y” Category Journals

Title of publication	Name of Journal	Year of Publication	Page Number
35. Characterization of immobilized endo-1,4-β-glucanase from <i>Thermotogapetrophila</i>. Muzna Dilshad, Mehmood Ali Khan, Malik umarfarooqgohar, Zahid Hussain .	<i>International Journal of Biology and Biotechnology</i>	2014	11 (4):525-535
36. OPTIMIZATION STUDIES FOR LIPASE PRODUCTION FROM A LOCALLY ISOLATED <i>BACILLUS spp.</i>	<i>BIOLOGIA (PAKISTAN)</i>	2013	59(2): 259-265.

Dawood Mustafa Bokhari, Umar Farooq Gohar, Zahid Hussain .			
37. Occurrence of HCV genotypes in different age groups of patients from Lahore, Pakistan. Amna Rasheed, Sajjad Ullah, Sajid Naeem, Muhammad Zubair, Waseem Ahmad, Zahid Hussain .	<i>Adv. life sci.</i>	2014	1(2): 19-25.
38. Traditional Herbal Medicine and Its Clinical Relevance: A Need to Preserve the Past for the Future Ahmed Hamza Tahir ^{1,2*#} , Zahid Hussain ^{3*} , Hamza Yousuf ^{4*} , Faryal Fazal ² , Muhammad Abdullah Tahir ² , Muhammad Kashif ⁵	Journal of Biosciences and Medicines	2022	Vol 10, pp 64-75
39. Insilco Approach for Unraveling Flagellin as a Promising Antigen for Next-Gen DNA Vaccines Ammar Mehfooz ¹ , Zahid Hussain ² , Humaira Zafar ³	Clinical Research and Reports	2023	Vol. 01, Issu:01

Training Course

- Training course titled ***Scientific and ethical procedures for laboratory animals-Course for Research Scientists***
- ***Training course titled*** THE USE OF NUCLEAR AND OTHER TECHNIQUES IN FOOD & AGRICULTURAL RESEARCH
- ***Bioinformatics Workshop***
- ***Patent writing and Filling one Day Workshop***

Ph.D. Thesis Supervised

Student Details:

- **Name:** Tooba Ume Habiba
- **Session:** 2019–2022
- **Roll No.:** 0684-Ph.D-2019
- **Registration No.:** 2019-GCUL-PhD-MB-82
- **ASRB Approved Title:** In silico Characterization, Molecular Cloning, Over expression and Functional Validation of Highly Immunogenic Protein of *Salmonella typhimurium*
- *Name of Supervisor: Dr. Zahid Hussain*

Conferences Attended

- Biocatalysis December- 2004, Graz, Austria
-
- Multistep Enzyme Catalyzed Processes, 18th-21st April 2006, Graz, Austria
- International Conference of Plant Scientists, 22-23rd February, 2011
- Biotechnology for Sustainable Development, 2014, GCU, Lahore
- Zoology Congress at Jamshoro, Feb. 2016

Research Supervision

59 BSc.(Honors) students	31. M.Phil. students	05 Ph.D. scholars (under supervision)
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Under Graduate B.Sc. (Hons) projects in progress

Supervised research and report writing of 58 (B.Sc.) students.

Post Graduate projects supervised and completed

Post Graduate

M.Phil Research Projects (Completed)

- o Cloning, expression and characterization of thermostable cellulytic gene (beta-glucosidase) from hyperthermophilic bacteria (*Thermotoga petrophila*)
- o Biosynthesis of protease from industrial waste by *Aspergillus niger*
- o Molecular analysis of interferon alpha 2b- gene in breast cancer.

- o Characterization of an immobilized recombinant endoglucanase from *Thermotoga petrophila*.
- o Preparation of inactivated oil based Newcastle disease Vaccine (Mukteswar strain) and its efficacy against
- o Molecular analysis of cop-A gene AP type ATPase in *Klebsiella pneumonia*]
- o Molecular analysis of cop-A gene AP type ATPase in *Klebsiella pneumonia*
- o Production, Optimization and Characterization of extracellular Lipase from *Pseudomonas putida*
- o Production of Recombinant TK0377 from a hyperthermophile *Thermococcus kodakaraensis*
- o Molecular Identification of Predominant HCV Genotype, its relation with viral load, transaminases and Interferon therapy
- o Production and Partial purification of extracellular ribonuclease from *Bacillus megaterium*
- o Extracellular Lipase production from *Bacillus* spp. Partial purification and characterization of enzyme
- o Optimized production and characterization of uricase from *Aspergillus niger*
- o Optimized production and characterization of xylose isomerase from locally isolated *Escherichia coli*

- o Purification and characterization of uricase enzyme isolated from *Bacillus* spp.
- o To evaluate the effect of different adjuvants on the immunogenicity of Hemorrhagic Septicemia Vaccine
- o To evaluate the effect of different adjuvants on Vaccine of Infectious Coryza (*Avibacterium paragallinarum*)
- o Evaluation of the anti viral activity of Banlec against different viruses
- o Cloning, expression and characterization of esterase gene from newly isolated anoxybacillus species
- o Heterologous Expression and Characterization of Thermostable Protease from the *Anoxybacillus* sp.
- o ***Improvement of Esterase from B. subtilis for Enhanced Thermostability and Enzymatic Activity***

Ø IMPROVEMENT OF THERMOSTABILITY AND

Ø ACTIVITY OF ALPHA AMYLASE FROM

Ø BACILLUS SUBTILUS (GC31) STRAIN WITH

Ø HELP OF RANDOM MUTAGENESIS IMPROVEMENT OF THERMOSTABILITY AND ACTIVITY OF ALPHA AMYLASE FROM *BACILLUS SUBTILUS* (GC31) STRAIN WITH HELP OF RANDOM MUTAGENESIS

- o IMPROVEMENT OF THERMOSTABILITY AND ACTIVITY OF ALPHA AMYLASE FROM *BACILLUS SUBTILUS* (GC31) STRAIN WITH HELP OF RANDOM MUTAGENESIS

Research Work Presented in Conferences

Thermostable Beta-1,4-Glucosidase from <i>ThermotogaPetrophila</i> displaying highest ever reported enzyme activity

Purification and characterization of cloned thermostable endo-Beta-1,4-Endoxylanase from <i>ThermotogaPetrophila</i> in mesophilic host

Bio electricity production with help of Bacteria
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Computer Skills

MS Word, Power point, Excel, Seqman, Seq Edit, Vector NTI, Pymol, Rasmol, Patchdock, ClustalW, Protparam, PDBsum, BLAST, Homology Modeling, Docking, Drug Designing, Reverse Vaccinology, Primer Designing, Insilico PCR, B-Cell Epitope, T-Cell Epitope Mapping, Insilico Mutagenesis, Data Scraping, Python, Power B I, Video Editing, Blog writing, Content Creation, Proof reading, Data Analysis.

Future Plans for Research

Sustainable Energy and Environment

1. Development of biofuels from agricultural and forestry waste.
2. Optimization of enzyme systems for cellulosic ethanol production.
3. Improvement of microbial strains for methane biogas production.
4. Development of biodiesel from algal biomass through enzymatic pathways.
5. Sustainable production of hydrogen fuel using thermostable hydrogenases.
6. Bioconversion of plastics into biofuel using bacterial consortia.