

Prof. Satya P. Singh: Resume

Academic, Research & Administrative Profile

Satya P. Singh, Ph. D.
Guest Faculty & Ph.D. Supervisor
(Former Professor & Head)
UGC-CAS Department of Biosciences
Saurashtra University
RAJKOT-360 005. Gujarat, INDIA

- UGC-BSR Faculty Fellow (Professor-Emeritus) (2020-2023)
- Professor & Head, Department of Biosciences, Saurashtra University (2000-2020)
- Associate Professor, Department of Biosciences, Saurashtra University (1994-2020)
- Coordinator, UGC-CAS Program, Saurashtra University (2013-2018)
- Coordinator, DST-FIST Program (2007-2012)
- Coordinator/PI, DBT-Multi-Institutional Project (2007-2012)
- PI, MoES-Multi-Institutional Net Working Project (2014-2018)
- Coordinator, M.Sc. Biotechnology, Saurashtra University (2004-2017)
- Coordinator, UGC DSA-Phase-3 and UGC COCIST (2003-2006)
- Assistant Professor, Microbiology, G. B. Pant University of Agriculture & Technology, Pantnagar, India (1986-1993)

AN EXECUTIVE SUMMARY OF THE PROFILE

Current Position: Guest Faculty & Ph.D. Supervisor

Previous Affiliations and Experiences

UGC- BSR Faculty Fellow (Emeritus Professor), Department of Bioscience, Saurashtra University, Rajkot, India. November 2020- November 2023

Head of the Department, UGC-CAS Department of Biosciences, Saurashtra University (2003-2020, 17 years)

Coordinator, UGC-CAS Program, Saurashtra University (2013-2018, 5 Years)

Coordinator, DST-FIST Program (2007-2012, 5 Years)

Coordinator/PI, DBT Multi-Institutional Project (2007-2012, 5 Years)

PI, MoES Multi-Institutional Net Working Project (2014-2018, 4 Years)

Coordinator, M.Sc. Biotechnology Program, Saurashtra University (2004-2017, 13 Years)

Coordinator, UGC DSA-Phase-3 and UGC COCIST Program (2003-2006, 5 Years)

Education

- Ph.D.: Griffith University, Brisbane, Australia
- M.Phil. (Partial): JNU-New Delhi
- M.Sc.: G. B. Pant University of Agriculture & Technology, Pantnagar
- B.Sc.: Avadh University, Ayodhya-Faizabad

E-mail

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Links

Research Gate: https://www.researchgate.net/profile/Satya_Singh5
GoogleScholar: <https://scholar.google.com/citations?hl=en&user=jiAzOcgAAAAJ>
Orcid: [0000-0002-7531-2872](https://orcid.org/0000-0002-7531-2872)
Scopus: <https://www.scopus.com/authid/detail.uri?authorId=22981831200>
Web of Science: [ID AAC-7238-2021](https://www.webofscience.com/wos/author/uri?uri=au%3A%2F0000-0002-7531-2872)
Research ID: <https://ResearchID.co/rid39700>
UGC: <https://vidwan.inflibnet.ac.in/profile/68903/Njg5MDM%3D>
LinkedIn: <https://www.linkedin.com/in/satya-singh-2285a5144/>

Publication Status

- Refereed Journals – 116 Research Papers
- Conference proceedings- 10
- Book Chapters- 30
- Conference presentations- 140

Citations, Impact Factors and h-Index of the publications

- 'h' Index: 35 (All) and 24 (Since 2017)
- Citations: 3630 (All) and 1775 (Since 2017)
- I10 Index: 73 (All) and 60 (Since 2016)
- Cumulative Impact factors: 210, Last five years- 75
- Research Gate Score: 35

Countries Visited/Worked in: Australia, Japan, Germany, Myanmar, South Africa

Visiting Professor/Scientist

- National Food Research Institute, Tsukuba, Japan
- University of Yangon Myanmar

Teaching Experience: 37 years (1986-Present) of Post Graduate Teaching; Major Disciplines: Microbiology, Biochemistry, Biotechnology, Molecular Biology

Research Areas: Diversity, Phylogeny & Biocatalytic potential of halophilic/haloalkaliphilic bacteria; Hyperthermophilic bacteria /Protein Engineering:

Structure & Function relationship; Metabolic regulation in Gram positive bacteria-*In Vivo*
High Field NMR

Research Supervision

- PhD- Awarded 25 Students (02 working)
- MPhil-Awarded 24 Students
- MSc-110 students. (05 working)

Research Projects

- MoES, Govt. of India
- DBT Multi-Institutional Project: Saurashtra Univ., IIT Delhi and Univ. of Delhi
- UGC Projects: CAS, DSA and COSIST Programme and other projects
- DST Infrastructural Project under FIST: DST sponsored FIST project
- GSBTM (Gujarat State Biotechnology Mission)
- Japan Research and Development Corporation: At NFRI, Tsukuba, Japan
- ICAR Sponsored Projects: at G. B. Pant University, Pantnagar, India

Research collaborations

- National Food Research Institute and Toyo University, Japan (Kiyoshi Hayashi)
- Griffith University, Brisbane, Australia, Prof. Peter Rogers & Prof. BKC Patel
- IIT, New Delhi (Prof. S. K. Khare)
- University of Delhi (Prof. Sanjay Kapoor)
- Central University of Hyderabad (Prof. Ch. Ramana Rao)
- Jawaharlal Nehru Technological University, Hyderabad (Prof. Ch. Sasikala).

Fellowships/Award/Honors

India: ICAR-SRF; CSIR-JRF; Graduate Research Assistantship; National Scholarship

International:

- International Travel Awards from FAOBMB/UNESCO, DST, SERB, CSIR, UGC, DBT
- Visiting Scientist Award, Univ of Medicine and Dentistry, New Jersey (USA)
- JSPS Invitation Fellowship, Japan
- ATTC-NSF (USA) Tuition Fee Award, Baltimore, Maryland, USA
- STA Visiting Fellowship, Japan
- Visiting Professor, Yangon University, Myanmar
- Griffith University Ph.D. Research Award, Australia

Panel Referee for the Scientific Journals: More than 20 Journals, including BBA, Frontiers in Microbiology, EMT, Bioresource Technology, Process Biochemistry, IJBIOMAC, Critical Reviews in Biotechnology, Environmental Technology

Project/Research Grant Evaluation:

- DBT (Department of Biotechnology), Government of India, New Delhi
- International Science Foundation, Sweden

DETAILED PROFILE

- **Father's Name:** (Late) Shree Shitla Prasad Singh
- **Date of Birth** 24 July 1958
- **Sex:** Male
- **Marital status:** Married with two children

Academic Records

Examination	University/Board	Year	Subjects	% of Marks	Division
High School	U.P. Board of Secondary Education	1973	Hindi, English, Science, Math, Biology	73.6	First
Intermediate	U.P. Board of Secondary Education	1975	Hindi, English, Physics, Chemistry, Biology	64.6	First
B.Sc.	Avadh University, Faizabad	1977	Chemistry, Botany, Zoology	68.1	First
M. Sc.	G.B. Pant Univ., Pantnagar	1980	Microbiology (major) Biochemistry (minor)	81	First
M. Phil./Ph.D.	Jawahar Lal Nehru University (JNU), School of Environmental Sciences, New Delhi, India	1981	Microbiology & Biochemistry	Completed courses of this program. But left it to join a doctoral fellowship at the Griffith University, Brisbane, Australia in March 1982.	
Ph.D.	Griffith University, Brisbane, Australia	1986	Microbial Biochemistry	-----	-----

Fellowships/Award/Honors

- **DST International Travel Award** for Extremophile-2016 - International Conference in **Kyoto, Japan, 12-16 September 2016**
- **UGC Grant for International Conference** in **Kyoto, Japan, 12-16 September 2016**
- **CSIR International Travel Award** for Extremophile 2008 - International Conference in **Cape Town, South Africa, 2008**
- **DST International Travel Award** for Extremophile-2008 - International Conference in **Cape Town, South Africa, 2008**
- **CSIR International Travel Award** for Extremophile 2006 - International Conference in **Brest, France, 2006**
- **Registration-Fee award** from the organizers of Extremophile 2006 - International Conference in **Brest, France, 2006**
- **UGC International Travel Grant** for Visiting **Australia** as part of Saurashtra University delegation, **October/November 2006**

- **DST International Travel Award** for Thermophile 2005 - International Conference in **Brisbane, Australia, 2005**
- **DBT International Travel Award** for Thermophile 2005- International Conference in **Brisbane, Australia, 2005**
- **Visiting Scientist** (Awarded at the University of Medicine and Dentistry, **New Jersey (USA),2005**)
- **Visiting Professor** (As a Member of Govt. of India Panel on Biotechnology), **Yangon University, Myanmar (2 weeks; February-March 2005)**
- **JSPS Invitation Fellowship, Japan**, October-December 2001
- **ATTC-NSF (USA)** Tuition Fee Award, July 2001, for Workshop on Extremophiles at The Center of Marine Biotechnology, Baltimore, Maryland, **USA**
- **DST International Travel Award** for conference in **Germany**, September 2000
- **CSIR International Travel Award** for conference in **Germany**, September 2000
- **FAOBMB/UNESCO Travel** award, 1997 to Attend and present paper in **Manila**
- **STA Visiting Fellowship, Japan** (Feb 1996 - Feb 1998, 2 years)
- **Griffith University Ph.D. Research Award, Australia** (1982-86; 4 years)
- **Senior Research Fellowship, ICAR, India** (1980 - 1981; 1 year)
- **Post-graduate Research fellowship, CSIR, India** (1980)
- **Graduate Research Assistantship** (Oct 1977 - June 1980)
- **National Scholarship, Govt. of India** (1973 - 1977; 4 year)

Appointments and Career Details: Starting from most recent

Regular Appointments

- **India:** Saurashtra University, Rajkot, **Professor, Microbiology, 2000 – Continue**
- **India:** Saurashtra University, Rajkot, **Associate Professor, Microbiology, 1994 – 2000**
- **India:** G.B. Pant University, Pantnagar, **Assistant Professor, Microbiology, >7 years; 1986- 93**

Visiting/Temporary Assignments

- **New Jersey (USA):** Visiting Scientist (awarded for 3 months) at the University of Medicine and Dentistry, 2005
- **Myanmar: Yangon University, Visiting Professor** (As a Member of Govt. of India Panel on Biotechnology), (2 weeks; February-March 2005)
- **Japan** (Tsukuba Science City): National Food Research Institute, **Visiting Scientist, October-December 2001**
- **Japan** (Tsukuba Science City): National Food Research Institute, **Visiting Scientist, 2 years; 1996-98**
- **Australia:** Griffith University, Brisbane, **Part-time tutor / Demonstrator, 3 years, 1983 –85**
- **India:** N. D. University of Agriculture & Technology, Faizabad, **Senior Research Fellow, 1 year, and 1980-81**
- **India:** G. B. Pant University, Pantnagar, **Graduate Research Assistant, 1977- 80**

Administrative cum Academic Experiences

- **Head**, Department of Biosciences, Saurashtra University; June 2003-2020
- **Coordinator**, UGC Center for Advance Studies (UGC-CAS: 2013-2018)
- **Coordinator**, UGC DSA Phase III Programme (2001-2006)
- **Coordinator**, UGC COSIST Programme (2001-2006)
- **Coordinator**, M. Sc. Biotechnology Programme, Department of Biosciences, Saurashtra University, Rajkot (2004-2017)
- **Coordinator**, FIST Programme of DST (2007-2011)
- **Chairman**, P. G. Board of Studies, Bioscience, Saurashtra University
- **Chairman**, Board of Studies, Microbiology, Saurashtra University
- **Chairman**, Board of Studies, Biotechnology, Saurashtra University
- **Chairman**, P. G. Board of Studies, Botany, Saurashtra University
- **Chairman**, P. G. Board of Studies, Zoology, Saurashtra University
- **Member**, Board of Studies, Microbiology, M. S. University, Baroda, Gujarat
- **Member**, Board of Faculty of Science, M. S. University, Baroda, Gujarat
- **Member**, School Board of Life Science North Eastern Hill University, Shilling
- **Member**, Research Progress Committees, Nirma University, Ahmadabad
- **Member**, Faculty of Science, Nirma University, Ahmadabad
- **Member**, Board of Studies, Microbiology, C. U. Shah University, Surendranagar
- **Member**, Board of Studies, Microbiology, Marwadi University, Rajkot
- **Member**, Board of Studies, Biotechnology, Marwadi University, Rajkot
- **Member**, Board of Studies, Biotechnology (Engineering), Saurashtra University
- **Principal Investigator**, DBT Multi-institutional Project (2007-2012)
- **Member, Advisory Committee**, Academic Staff College, Saurashtra University
- **Member**, Managing Parent Teacher Council, Delhi Public School, Rajkot
- **Member**, Managing Committee, Delhi Public School, Rajkot

Panel Referee for the Scientific Journals

- Biochim Biophysic Acta (BBA)- Proteins & Proteomics
- Enzyme & Microbial Technology (Elsevier Publisher)
- Bioresource Technology (Elsevier Publisher, UK)
- Critical Reviews in Biotechnology (Canada)
- Process Biochemistry (Elsevier Publisher, UK)
- Journal of Industrial Microbiology & Biotechnology (JIMB, USA)
- European Journal of Soil Biology (EJSB, Europe)
- International Journal of Systematic & Evolutionary Microbiology (IJSEM), (Microbiology Society, UK)
- Frontiers in Microbiology
- Science of the Total Environment (Elsevier)
- Environmental Research (Elsevier)
- International Journal of Biological Macromolecules (IJBIOMAC) (Elsevier, UK)
- Environmental Monitoring and Assessment (International, Springer)
- Current Science (Bangalore, India)
- Journal of Basic Microbiology
- Applied Biochemistry and Biotechnology (UK/USA)
- Environmental Technology

- Biotechnology & Bioprocess Engineering (BBE- South Korea)
- 3 Biotech (Springer)
- Biologiya (Europe)
- J. Food Science & Technology (Mysore, India)
- Journal of Bioinformatics and Sequence Analysis
- African Journal of Food Research (Africa)
- African Journal of Microbiological Research (Africa)

Member, Project Review Committees

- Directorate of Groundnut Research, Junagadh (Gujarat, India)
- Central Salt and Marine Chemical Research Institute, Bhavnagar (Gujarat, India)
- DBT-Nominee, Recombinant DNA Technology Committee, Directorate of Groundnut Research, Junagadh

Project Evaluation for Research Grants

- DBT (Department of Biotechnology), Government of India, New Delhi
- International Science Foundation, Sweden

Visits and Professional Experience Overseas

- **Japan:** Visited Kyoto, Japan, in **September, 2016** for attending and presenting paper in International Conference, “Extremophile-2016” organized by the Kyoto University, Kyoto, Japan Under the banner of the International Society for Extremophiles during 12-16 September 2016. During this visit, I also attended a Two-Day Workshop on ‘Deep Sea Microbiology’ conducted at Kyoto University, Japan from 10-11 September 2016.
- **South Africa:** Visited Cape Town, South Africa in **September, 2008** for attending and presenting paper in International Conference, “Extremophile-2008” organized by University of Western Cape and University of Cape Town. Interacted various scientists from different countries and had discussions with the faculty members of University of Western Cape and University of Cape Town to explore and establish academic collaborations at teaching and research levels
- **Australia: In October-November 2006.** As a member of an official delegation from Saurashtra University, Rajkot (India) visited Royal Melbourne University of Technology (RMIT) and Melbourne University in Melbourne; Macquarie University in Sydney and Griffith University in Brisbane to explore and establish academic collaborations at teaching and research levels
- **Australia:** Griffith University, Brisbane; In **September 2005**, I visited Griffith University to present my paper at an International Conference and also interacted with my research collaborator, Dr. B. K. C. Patel, at Griffith University, Brisbane, Australia

- **Yangon University, Myanmar: In February-March, 2005.** During my **2-week** visit to Yangon University, Myanmar, as Visiting Professor and member of the Government of India panel for Biotechnology, I taught Microbiology and Molecular Biology to M. Sc. and Ph.D. students and guided Ph.D. research of 02 students and acted as external examiner for 02 Ph.D. students
- **Japan; Tsukuba Science City; In September-December, 2001,** for **3 months** as visiting scientist in Tsukuba Science City, Japan, at NFRI, I further continued my work on Gene shuffling as visiting scientist, which I am still pursuing in their collaboration
- **University of Philippines, Philippines: 1997.** During my **1-week** visit to University of Philippines, Philippines, as a FAOBMB Young Scientist Awardee, I interacted with the students and faculty of the university and presented my work at FAOBMB Symposium
- **Japan: Tsukuba Science City;** From 1996-98 for **2 years** as visiting scientist in Tsukuba Science City, Japan at NFRI, I used most of the modern techniques in the area of Molecular Biology and Genetic Engineering for my research project on Gene shuffling, which I continued returning to my parent institute
- **Germany: Hamburg Technical University at Hamburg;** In September **2000,** I visited Hamburg Technical University at Hamburg, Germany for presenting my paper in an International Conference and also interacted with the faculty working in the areas of extremophiles
- **Australia: Griffith University, Brisbane;** I stayed **4 years (1982-86)** at Griffith University, Brisbane, as a Doctoral student, during which I applied most of the Microbiological/Biochemical tools in my research and extensively used EM and *in-vivo* NMR techniques.
- **Australia: Griffith University, Brisbane;** During my stay at Griffith University, Brisbane (**1982-86**), I also taught B. Sc students as a Part-time tutor / Demonstrator for 3 years, 1983 –85

Teaching and Research Experience

- (a) **Teaching:** Postgraduate **37** years; Undergraduate **11** years
- (b) **Research:** Pre-doctoral, **5** years, Doctoral, **4** years, After Ph.D., **35** years
- (c) **Guiding Research:** **35** years, Dissertation/Thesis guided:
Ph.D.: awarded, **25** and continuing, **2**
M. Phil: **24**
M. Sc: **110**, continuing **05**
- (d) **Ph.D. Thesis Evaluation:** Evaluated 60 Ph.D. Theses from various universities:
- BHU, Varanasi
 - IIT Delhi, New Delhi

- Calcutta University, Kolkata
- Delhi University, Delhi
- Panjab University, Chandigarh
- Madras University, Chennai
- Goa University, Goa
- Gauhati University, Guwahati
- Pondicherry University, Pondicherry
- Pune University, Pune
- Madurai Kamraj University, MKU, Madurai
- Bhardiar University, Coimbatore
- Gujarat University, Ahmedabad
- Gujarat Vidyapeeth, Ahmedabad
- M. S. University, Baroda
- CSIR Academy-Central Salt & Marine Chemical Research Institute, Bhavnagar
- Bhavnagar University, Bhavnagar
- S.P. University, V.V. Nagar, Gujarat
- M.L. Sukhadia Udaipur University, Udaipur
- RML Avadh University, Faizabad
- Bundelkhand University, Jhansi (U.P.)
- V. N. University of South Gujarat, Surat
- M.D. University, Ajmer
- Periyar University, Salem, Tamil Nadu
- R.D. Jabalpur University, Jabalpur, M.P.
- CHARUSAT, Gujarat

(e) Courses Taught: General Microbiology, General Biochemistry, Microbial genetics, Fermentation Technology, Enzyme Technology, and Techniques in Molecular Biology

(f) Post-Doctoral Fellows: 04

Field of Specialization

- Diversity, Phylogeny & Biocatalytic potential of halophilic/haloalkaliphilic bacteria, actinobacteria and archaea
- Hyperthermophilic bacteria /Protein Engineering: Structure & Function relationship
- Recombinant enzymes from haloalkaliphilic bacteria
- Metagenomics of Extreme Environment
- Metabolic regulation in Gram-positive bacteria

Key Journals of my Publications

J. Bacteriology, FEMS Microbiol Lett., Int J Syst Evol. Microbiol., J. Chromatography- A and B, Process Biochemistry, Critical Reviews in Biotechnology, Enzyme & Microbial Technology (EMT), Bioresource Technology, Lett in Appl. Microbiol., J. Ferm. Bioeng., J. Molecular Catalysis, B: Enzymatic, J. Gen. Appl. Microbiol., International Journal of Biological Macromolecules (IJBIMAC), Current Science, World J. Microbiol & Biotechnol

Publication Status

- **Refereed Journals – 116 Research Papers**
- **Conference proceedings- 10**
- **Book Chapters- 30**
- **Conference presentations- 140**

Citations, Impact Factors and h-Index of the publications

- **‘h’ Index: 35 (All) and 24 (Since 2017)**
- **Citations: 3630 (All) and 1775 (Since 2017)**
- **I10 Index: 73 (All) and 60 (Since 2016)**
- **Cumulative Impact factors: 210, Last five years- 75**
- **Research Gate Score: 35**

Key Publications

1. Gohel, S.D., Majithiya, Vaishali, and **Singh S.P.** 2023, Genetic and physiological diversity of marine Actinobacteria isolated from Okha coastline, Gujarat, India-”, **Geomicrobiology (Taylor & Francis) (IF 2.40)**, Accepted for publication on 13 May 2023, DOI:[10.1080/01490451.2023.2218383](https://doi.org/10.1080/01490451.2023.2218383)
2. Shukla, Rushit and **Singh S.P.** 2023, Purification and Characterization of an Amylase From a Newly Isolated *Geobacillus Thermoleovorans* TTIO4 From Hot Spring of Tuwa-Timba”, ‘**Starch (Wiley) (IF 2.688)** Accepted for publication on 05 May 2023, DOI, <https://doi.org/10.1002/star.202200254>
3. Thakrar Foram, Koladiya Gopi and **Singh S. P.** 2023 “Heterologous Expression and Structural elucidation of a highly thermostable alkaline serine protease from haloalkaliphilic actinobacterium, *Nocardiopsis* sp. Mit-7”, **Applied Biochemistry and Biotechnology (IF 3.10) (Springer), Published Online on 15 April 2023**, <https://doi.org/10.1007/s12010-023-04472-3>
4. Kikani, B.A. Patel, R.K., Thumar, J.T. Bhatt, H.B., Rathore, Dalip, Koladiya, Gopi, and **Singh S.P.** 2023, Solvent tolerant enzymes in extremophiles: Adaptations and Applications”, **International Journal of Biological Macromolecules (IJBIOMAC) (IF 8.10) (Elsevier)**, <https://doi.org/10.1016/j.ijbiomac.2023.124051>
5. Dobariya Ankita, Mankad Gira, Ramavat Hasti, and **Singh, S. P.** 2023 “Efficacy of the fruit and vegetable peels as substrates for the growth and production of α -Amylases in Marine Actinobacteria”, **Applied Biochemistry and Biotechnology (IF 3.10) (Springer), Published Online on 17 April 2023**, <https://doi.org/10.1007/s12010-023-04422-z>
6. Raiyani, Nirali, and **Singh S.P.** 2023, Microbial community and predictive functionalities associated with the marine sediment of Coastal Gujarat, **Environmental Science & Pollution Research (IF 5.10)**, Published On-Line 18 January 2023, <https://doi.org/10.1007/s11356-023-25196-1>
7. Purohit, M.K, Rathore Dalip Singh, Koladiya Gopi, Pandey Sandip and **Singh S. P.**, 2022, Comparative analysis of the catalysis and stability of the native, recombinant and metagenomic alkaline proteases in organic solvents, **Environmental Science and Pollution Research (IF 5.10) (Springer)**, accepted for published, 07 June 2022
8. Thakur Nagendra, **Singh Satya P.** and Zhang, Changyi, 2022. Microorganisms under extreme environments and their applications, *Current Research in Microbial Sciences* (2022), doi: <https://doi.org/10.1016/j.crmicr.2022.100141>
9. Rupal Joshi, Vikram Raval, Hitarth Bhatt and **S. P. Singh**, 2022 “Phenotypic characteristics, phylogenetic analysis and characterization of alkaline proteases of marine bacteria *Geomicrobium halophilum*, *Oceanobacillus oncorhynchi*, and *Oceanobacillus khimchii*”, **BIOLOGIA (IF 1.34)**, Accepted 05 April 2022, Published on-line, [10.1007/s11756-022-01095-7](https://doi.org/10.1007/s11756-022-01095-7)
10. Vikram Raval, Dalip Singh Rathore and **S. P. Singh**, 2022 “Comparative studies of the characteristics of two alkaline proteases from *Haloalkaliphilic bacterium* D-15-9 and *Oceanobacillus onchorhynchii* Mi-10-54”, **APPLIED BIOCHEMISTRY AND MICROBIOLOGY (IF 0.95) (Springer)** Accepted April 2022, Published on-line
11. Bhatt, H.B. and **Singh S.P.** 2022, Diversity of cultivable bacteria in a saline desert of Little Rann of Kutch, India: a phylogenetic perspective , **Frontiers in Marine Science (IF 4.90)**, doi: 10.3389/fmars.2022.769043

12. Dwivedi, Purna, Sharma, A. K. and Singh, S.P. 2021. Biochemical properties and repression studies of an alkaline serine protease from a haloalkaliphilic actinomycete, *Nocardiopsis dassonvillei* subsp. *albirubida* OK-14. **Biocatalysis and Agricultural Biotechnology**, 35:1-7 (Elsevier; **IF: 0.90**), DOI: <https://doi.org/10.1016/j.bcab.2021.102059>
13. Kikani, B.A. and Singh, S.P. 2021. Amylases from thermophilic bacteria: Structure and Function Relationship. **Critical Reviews in Biotechnology**, DOI: [10.1080/07388551.2021.1940089](https://doi.org/10.1080/07388551.2021.1940089) (Taylor & Francis; **IF: 8.102**)
14. Rathore, D. R., Sheikh, M., Gohel G.D, and Singh, S.P. 2021. Genetic and phenotypic heterogeneity of the *Nocardiopsis alba* strains of sea water. **Current Microbiology**, 78: 1377-1387 (Springer; **IF: 1.75**). DOI: [10.1007/s00284-021-02420-0](https://doi.org/10.1007/s00284-021-02420-0)
15. Chauhan, J.V., Mathukiya, R. Singh, S.P. and Gohel, S.D. 2021. Two steps purification, biochemical characterization, thermodynamics and structure elucidation of thermostable alkaline serine protease from *Nocardiopsis alba* strain OM-5. **International Journal of Biological Macromolecules (IJBIOMAC)**, 169: 39-50 (Elsevier; **IF: 5.16**), <https://doi.org/10.1016/j.ijbiomac.2020.12.061> , Available On-Line 12 Dec 2020.
16. Rathore, D R and Singh, S.P. 2020. Kinetics of growth and co-production of amylase and protease in novel marine actinomycete, *Streptomyces lopnurensis* KaM5. **Folia Microbiologica (Springer; IF: 1.70)**, Accepted 07 Dec 2020 and available on line. <https://doi.org/10.1007/s12223-020-00843-z>
17. Sharma, A.K. Kikani, B.A. and Singh S.P. 2020, Diversity and Phylogeny of Actinomycetes of Arabian Sea along the Gujarat Coast. **Geomicrobiology Journal** (Taylor & Francis, **IF 1.90**), DOI: [10.1080/01490451.2020.1860165](https://doi.org/10.1080/01490451.2020.1860165)
18. Raiyani, Nirali and Singh S.P. 2020, Extraction of environmental DNA, construction of metagenomic libraries and functional screening of enzymes from salt pan soil, **Indian Journal of Geo-Marine Sciences**, Accepted (NISCARE, CSIR, **IF 0.50**),
19. Raiyani, Nirali and Singh S.P. 2020, Taxonomic and functional profiling of the microbial communities of Arabian Sea: A Metagenomics approach **Journal: Genomics (Elsevier, IF 6.20)**, 112:4361- 4369 <https://doi.org/10.1016/j.ygeno.2020.07.024>
20. Bhatt, H.B. and Singh S.P. 2020, Cloning, Expression and structural elucidation of a biotechnologically potential alkaline serine protease from a newly isolated Haloalkaliphilic *Bacillus lehensis* JO-26, **Frontiers in Microbiology (IF 4.25)**, 11:1-16, <https://doi.org/10.3389/fmicb.2020.00941>
21. Sharma, A.K. Kikani, B.A. and Singh S.P. 2020. Biochemical, thermodynamic and structural characteristics of a biotechnologically compatible alkaline protease from a haloalkaliphilic, *Nocardiopsis dassonvillei* OK-18 **International Journal of Biological Macromolecules (IJBIOMAC)**, DOI: [10.1016/j.ijbiomac.2020.03.006](https://doi.org/10.1016/j.ijbiomac.2020.03.006), **In Press (IF 4.78)**
22. Thakrar, F.J. and Singh S.P. 2019. Catalytic, thermodynamic and structural properties of an immobilized and highly thermostable alkaline protease from a haloalkaliphilic actinobacteria, *Nocardiopsis alba* Tata-5. **Bioresource Technology**, 278:150-158 (**IF 5.802**)
23. Sheikh, M., Rathore, D.S., Gohel, S.D. and Singh S.P. 2019. Cultivation and characteristics of the Marine Actinobacterial from the Sea water of Alang, Bhavnagar. **Indian Journal of Geo-Marine Sciences (CSIR-NISCARE)**, 48(12), 1896-1901 (**IF 0.4**).
24. Gohel, S. D. and Singh S.P. 2018. Thermodynamics of a Ca²⁺ dependent, highly thermostable and detergent compatible purified alkaline serine protease from *Nocardiopsis xinjiangensis* strain OM-6. **International Journal of Biological Macromolecules (IJBIOMAC)**, <https://doi.org/10.1016/j.ijbiomac.2018.02.157>, 113:565-574 (**IF 4.78**)
25. Gohel, S. D. and Singh S.P. 2018. Molecular phylogeny and diversity of the salt-tolerant alkaliphilic actinobacteria inhabiting Coastal Gujarat, India. **Geomicrobiology Journal**, DOI: [10.1080/01490451.2018.1471107](https://doi.org/10.1080/01490451.2018.1471107), 35:9, 775-789 (**IF 1.5**)
26. Thakrar, F.J., Kikani, B.A., Sharma, A.K. and Singh S.P. 2018. Stability of alkaline proteases from haloalkaliphilic actinobacteria probed by circular dichroism spectroscopy. **Applied Biochemistry and Microbiology (Russia)**, 54(6),1-12 (**IF 0.68**)
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Conference/Seminar Presentations

135 Research papers presented in 15 National (India) and 12 International conferences held in France, Australia, Japan, Philippines, USA, Germany, South Africa and India

Key conferences attended and presented papers

- **Invited Talk: “Microorganisms and their Functioning in Changing Environment”** Presented on 05 January 2024 in “Internship Certificate Program” December 2023-January 2024, GEER Foundation, Gandhinagar, Gujarat, India
- **Invited Talk: “Extreme Habitats and Microbial Diversity: Changing Scenario of Nutrient Cycling and Climate Change”** Presented in a National Conference “Water and Environment: Challenges and Opportunities for Sustainable Development” 18-20 December 2023, Gujarat Institute of Desert Ecology at the National Forensic Sciences University, Gandhinagar, Gujarat, India

- **Invited Talk: “Extremophiles: Biocatalytic Potential”** Presented On-Line in 5th International Summer School on Bioeconomy and Sustainable Development, 26 July 2023, Organized by: Centre for Training and Lifelong Learning of National and Kapodistrian University of Athens., Greece (24-27 July 2023)
- **Participation: ‘mRNA Structure & Function: Role of modifying enzymes’**, GEN Webinars, 28 March, 2023.
- **Participation: ‘Plasmid Manufacturing for Biomedical Applications’**, GEN Webinars, 10 March, 2023.
- **Participation: ‘No Longer PerPLEXed: True Spatial Multiomics Is Here’**, GEN Webinars, 17 February, 2023.
- **Participation: FEMS Microbiology Ecology Webinar on Microbial Life Strategies**, 17 November, 2022.
- **Invited Talk: “Metagenomics of the Saline Habitats of Coastal Gujarat, India: Diversity and Enzymatic Aspects”** Presented On-Line in the “2nd International Meet on Biotechnology and Bioengineering (BIOTECHMEET2022), Dubai, UAE, 24 – 26 October, 2022.
- **Invited Talk: “Life in Extremity: Exploration and Evolution”** Presented in the UGC Sponsored Refresher Course held in HRDC at the Guru Ghasi Das Viswavidyalaya (A Central University), Bilaspur, 24 August 2022
- **Invited Talk: “Changing Scenario in Life Sciences: From Single Gene to Microbiome”** Presented in the UGC Sponsored Refresher Course held in HRDC at the Guru Ghasi Das Viswavidyalaya (A Central University), Bilaspur, 23 August 2022
- **Invited Key Note Talk: “Bacterial Diversity and Biocatalytic Potential of Sea Water and Related Saline Habitats: A Perspective from the Gujarat Coast, India”** Presented in the “International Conference and Expo on Applied Microbiology " on 17 June 2022.
- **Invited Talk: “Genetic Diversity, Expression and Characteristics of Protease Genes of Haloalkaliphilic Bacteria from the saline habitats”** Presented in the “9th International Webinar on Biotechnology Research" on 25 February 2022
- **Key Note Talk: “Plant-Microbes Interaction and Salinity Stress: Rhizobacterial dynamics and Microbiome Engineering”** Presented in “National Symposium -CUM-Workshop: Biodiversity and its Utilization & Conservation in Central India” held at the Guru Ghasi Das Viswavidyalaya (A Central University), Bilaspur, 21 February 2022
- **Invited Talk: “Regulation of Gene Expression in Prokaryotes”** Presented at Gujarat University, Ahmedabad in “Webinar –Ara of the Molecular Biology”, on 17 February 2022
- **Invited Talk: “Changing Spectrum of Teaching and Research in Biosciences: From Watson-Crick to Biomes”** at UGC Sponsored Refresher Course held in HRDC, JNV University, Jodhpur, Rajasthan, India, 17 January 2022
- **Invited Talk: “Scientific Research: Planning, Methodology and Quality Assessment- Intricacies of Research Methodology”** Presented at Atmiya University & Shree M N Virani College of Science, Rajkot on 14 October 2021
- **Invited Talk: “Exploration of diversity and biocatalytic potential of microorganisms from the saline habitats: Approaches and dimensions”** Presented at Gujarat University, Ahmedabad in “the SKILL (Scientific Knowledge and Intelligent Logic Laboratory Practices) –Workshop" on 14 September 2021

- **Invited Talk: “Quality Evaluation and Ethics in Research and Publications”**
Presented at V N South Gujarat University, Surat in Pre-PhD Registration Course Work held on 27 August 2021
- **Invited Talk: “Attributes of Plant Growth Promoting Rhizobacteria in biocontrol and combating salinity stress”** Presented in an International Virtual Conference, held at M L Sukhadia University, Udaipur, Rajasthan, India on ‘Advances in Plant Sciences’ held on 02 July 2021
- **Invited Talk: “Preparation of Research Proposals and Assessment of the Research output”** Presented in B K N M University, Junagadh, A Workshop for PhD students’ held on 22 January 2021
- **Invited Talk: “Actinobacteria from Extreme Environment: Diversity and Biocatalytic Potential”** Presented in a GSBTM- Sponsored National Conference, on ‘Novel Trends and Advances in Pure & Applied Biological Sciences’ at **N V Patel College of Pure & Applied Science, Vidya Nagar, Gujarat**” 26 February 2020
- **Invited Talk: “Amazing World of Microorganisms in Extreme Environment”**
Presented in a National Conference on ‘Panorama of Life Sciences-2020’ at **M K S Bhavnagar University, Bhavnagar, Gujarat**” 28 January 2020
- **Invited Talk: “Basic Science VS Applied Sciences & Career Opportunities in Sciences”** **Christ College, Rajkot, 06 July 2019**
- **Invited Talk: “Dimensions of Research on Extremophiles”** **Christ College, Rajkot, 06 July 2019**
- **Invited Talk: “Career Opportunities in Sciences and Importance of Communication Skill”** Presented in DST (Govt. of India) Sponsored -INSPIR Internship Programme for School Students, **BKNM University, Junagadh**” 21 June 2019
- **Invited Talk: “Biochemical Characteristics and Gene Profiling of the extracellular proteases of Haloalkaliphilic bacteria”** Presented in a UGC-GUJCOAST Sponsored National Conference, on ‘Recent and Emerging Issues in Microbiology and Pharmaceutical Biotechnology’ at **Gujarat University, Ahmadabad**” 15 March 2019
- **Invited** as Resource Person/Judge in UGC-SAP Sponsored National Conference on ‘Biological Tools for Sustainable Environment’, **Veer Narmad University of South Gujarat, Surat, 02 March 2019**
- **Invited Talk “Gene Shuffling & Molecular Evolution”** at **UGC Sponsored Refresher Course held in HRDC, Sardar Patel University, V V Nagar, India, 15 February 2019**
- **Invited Talk “Microorganisms of Extreme Environment: Diversity & Potential”** at **UGC Sponsored Refresher Course held in HRDC, Sardar Patel University, V V Nagar, India, 15 February 2019**
- **Invited Talk: “Directed Evolution & Gene Shuffling: The Concept and Techniques ”** Presented in MHRD Sponsored Faculty Development Programme (FDP), **Gujarat University, Ahmadabad**” 26 October 2018
- **Invited Talk: “Directed Evolution & Gene Shuffling ”** Presented in **Christ College, Rajkot**” 09 March 2018
- **Invited Talk: “Extremophiles and Biocatalytic Potential ”** Presented in National Conference on ‘Contemporary Developments at Biotech-Bioinformatics Interface’ held at **H N University of North Gujarat, Patan, 26 March 2017**
- **Invited Talk “A Perspective of the Current Biology”** at **Jawahar Navodaya Vidyalaya, Aliavada, Jamnagar, India, 21 September 2016**

- Extremophile-2016, **Kyoto, Japan**, 12-16 September 2016; Two research papers presented
- Attended Workshop on “ Deep Sea Microbiology”, **Kyoto University, Kyoto, Japan**, 10-11 September 2016
- **Invited Talk** “A General View of the Microorganisms from Extreme Environment” at **Shree H. N. Shukla College, Saurashtra University, Rajkot, India**, 03 August 2016
- **Invited Talk** “Extreme Environment and Microbes” at **UGC Sponsored Refresher Course held in HRDC, Saurashtra University, Rajkot, India**, 08 June 2016
- **Invited Talk** “Environmental Management and Cleaning Pollutants involving Microorganisms” at **UGC Sponsored Refresher Course held in HRDC, Saurashtra University, Rajkot, India**, 10 June 2016
- **Invited Talk:** “Characteristics of Extracellular Proteases of Haloalkaliphilic Bacteria and Actinobacteria” Presented in **National Conference on ‘Recent Advances in Biological Sciences, Biotechnology & Sustainable Development’ held at M. L. Sukhadia University, Udaipur**, 18-19 March 2016
- **Invited Talk:** “Diversity and enzymatic potential of Haloalkaliphilic and thermophilic actinobacteria” Presented in **National Conference on ‘Microbial Biotechnology: Clustering Research & Industrial Demand’ held at Gujarat University, Ahmedabad**, 20-21 February 2016
- **Invited Talk:** “Haloalkaliphilic bacteria and actinomycetes and their enzymatic potential” Presented in **International Conference on ‘Innovative Trends in Biological, Chemical and Physical Sciences (ITCPB-2016)’ held at Annasaheb Magar College, Pune University, Pune**, 9-10 February 2016
- **Invited Talk:** “Extremophiles and their Biotechnological potential” A talk presented in the Department of Botany & Microbiology- Biotechnology. For the MSc/PhD students at **Gujarat University, Ahmedabad**, 08 February 2016
- **Invited** as Judge in Science Excellence Competitive Conference, **Gujarat University, Ahmedabad**, 26 September 2015
- **Invited Talk** “Saline Habitats: Microbial Diversity and Biotechnology” at **UGC Sponsored Refresher Course held in HRDC, S.P. University, V. V. Nagar, India**, 21 September 2015
- **Invited Talk** “Environmental Pollution and Microorganisms” at **UGC Sponsored Refresher Course held in HRDC, S.P. University, V. V. Nagar, India**, 21 September 2015
- **Invited Talk** “Microbes of Extreme Environment” at **UGC Sponsored Refresher Course held in Gujarat University, Ahmedabad, India**, 12 June 2015
- **Invited Talk** “Role of microbes in Environmental Management” at **UGC Sponsored Refresher Course held in Gujarat University, Ahmedabad, India**, 12 June 2015
- **Invited Presentation:** “A Concept Paper on the Metagenomics of Saline Habitats of Coastal Gujarat” Presented in **DBT Sponsored Brain Storming Work shop on Metagenomics held at NEERI, Nagpur**, 11-12 October 2011
- **Invited Talk** “Basic Sciences as Career Options. DST-New Delhi Sponsored work shop “Innovation in Science Pursuits for Inspired Research (INSPIRE)- Summer Camp” at **University of North Gujarat, Patan, Gujarat, India**, 24 May, 2011
- **Invited Talk:** “Role of Microbes in Environmental Monitoring” at **UGC Sponsored Refresher Course held in Saurashtra University, Rajkot, India**, 10 March, 2011

- **Invited** as Judge in Science Excellence Competitive Conference, **Gujarat University, Ahmedabad**, 08 January 2011
- **Invited Talk** “Basic Sciences VS Applied Sciences: Career Options in Basic Sciences. DST, New Delhi Sponsored work shop “Innovation in Science Pursuits for Inspired Research (INSPIRE)- Summer Camp” at **Saurashtra University, Rajkot, India**, 06 May, 2010
- **Invited Talk** “Dimensions in Environmental Biotechnology” GSBTM Sponsored Work shop at **Juagadh Agricultural University, Junagadh, India**, 05 May, 2010
- **Invited Talk** “Diversity, Phylogeny and Metagenomics of Haloalkaliphilic bacteria from Coastal Gujarat” at **M.S. University, Baroda, India**, 29 March, 2010
- **Invited Talk** “Microbes in Extreme Environment” at **UGC Sponsored Refresher Course held in Saurashtra University, Rajkot, India**, 12 March, 2010
- **Invited Talk** “Role of microbes in cleaning the environment” at **UGC Sponsored Refresher Course held in Saurashtra University, Rajkot, India**, 12 March, 2010
- **Invited Talk** “Metagenomics of Saline habitats of Coastal Gujarat” in National Symposium at **Department of Biochemistry, Saurashtra University, Rajkot (India)**, 30 January 2010
- **Invited** as Judge in Science Excellence Competitive Conference, Gujarat University, Ahmedabad, India 09 January 2010
- **Invited Talk** “Bioremediation of Environment: A Multidisciplinary Approach” at **UGC Sponsored Refresher Course held in Gujarat University, Ahmedabad, India**, 04 December, 2009
- **Invited Talk** “Microbes from Extreme Environment: Opportunities and Avenues” at **UGC Sponsored Refresher Course held in Gujarat University, Ahmedabad, India**, 04 December, 2009
- **Invited Talk** “Monitoring and Remediation of Environment: A Necessity for Interdisciplinary Approach” at **UGC Sponsored Refresher Course held in Saurashtra University, Rjkot, India**, 09 March, 2009
- **Invited Talk** “Microbes from Extreme Environment: Huge Opportunities for Applications in Environment and Industries” at **UGC Sponsored Refresher Course held in Saurashtra University, Rajkot, India**, 09 March, 2009
- **Invited Talk** “Alkaline Proteases among Haloalkaliphilic Bacteria dwelling in saline habitats of Coastal Gujarat: Distribution, Biochemical Properties and Metagenomics” in National Symposium on “Recent Trend in Cellular Research” at **Department of Biochemistry, Saurashtra University, Rajkot (India)**, 09 March, 2009
- **Invited Talk.** “Biocatalytic Potential under Multitude of Extremities: Vast Opportunities for Industrial and Environmental Applications” in National Conference on “Microbial Technology on Sustainable Environment” at **Gujarat University Ahmedabad (India)**, 02-03 March, 2009
- **Invited** as Judge in Science Excellence Competitive Conference, Gujarat University, Ahmedabad, 09 January 2009
- Extremophile-2008, **Cape Town, South Africa**, 07-11 September 2008; four papers presented
- **Invited Talk.** “Haloalkaliphilic bacteria from coastal Gujarat: Diversity and Biocatalytic potential under multitude of extremities” in National Conference on “Recent advances in Molecular Biology” at **Nirma University of Science & Technology, Ahmedabad (India)**, 26 March, 2008
- UGC-DSA National Conference, Bioresources, utilization and conservation,

- Rajkot, **India**, 17-18 February 2006, 10 research papers presented by my group
- Thermophile: From evolution to Revolution, Gold Coast, **Australia**, 2005; Two papers presented.
 - **Invited Talk**. Microbes from Extreme environments: Molecular Biology and Biotechnological Perspective, Indore (**India**), 21-22 October, 2005
 - **Invited Talk**. Alkaline proteases from Haloalkaliphilic organisms. Regional Symposium on Microbial Biotechnology”, Ahmedabad (**India**), 22-23 January, 2005
 - **Invited Talk**. “Microbes from Extremities”, One Day Seminar, Christ College, Rajkot (**India**), 17 January 2005
 - **Invited Talk** Extracellular Alkaline protease from Haloalkaliphilic Bacteria: Diversity **International conference on Microbial Diversity. Delhi**, April 16-18, 2005
 - **92nd Indian Science Congress, Nirma University, Ahmedabad** 03-07 January 2005
 - Internal Quality Assurance Cell, Saurashtra University, Rajkot. Presented A paper on “Quality in Pure & Applied Science”, March 18-20 March 2005
 - **Invited Lecture**. Diversity of haloalkaliphilic bacteria from coastal Gujarat with respect to extracellular proteases and their properties”, National conference on sustainable development and microbial diversity, Ahmedabad (**India**), 1-2 March, 2003
 - **Invited Talk**. National Conference on Environmental protection”, Rajkot (**India**), 6-7 January, 2003
 - National conference on Environmental Biology, **17-18 October 2002, Rajkot (India)**.
 - **Invited Talk**. Structure & function relationship of β - glucosidase from *Cellvibrio gilvus* and *Agrobacterium tumefaciens*: Gene shuffling , over expression and protein solubilization. National Seminar on “Present status of Microbiology and challenges for sustainable development”, Sagar (**India**), 5-7, March, 2001.
 - Extracellular Protease among the Alkalophilic and Haloalkaliphilic Bacteria and Actinomycetes Isolated from the Coastal Gujrat of Western India. **The 3rd International Congress on Extremophiles. 3-7 September 2000, Hamburg, Germany.**
 - In-vivo and in-vitro solubilization of overexpressed proteins. International Conference on Probing in Biological Systems, **Mumbai, India, 7-11 February 2000**
 - The 26th Ann. Meeting of the US-Japan Cooperative Program in Natural Resources (UJNR) – Protein Resource Panel, December 14-19, 1997, **Tsukuba, Japan**
 - Construction and expression of chimeric β - glucosidase gene. Ann. Conf. of Japan Society of Bioscience , Biotechnology and Agrochemistry, **Tokyo 1997**
 - Construction, over expression and folding of two chimeric β - glucosidases. **25th Ann. FAOBMB Symposium, Manila, Phillipines, Dec 1997**
 - Importance of five amino acid residues at c-terminal region for the folding and stability of β - glucosidases. 25 th Ann. FAOBMB Symposium, **Maniala, Phillipines, Dec 1997**
 - Chimeric β -Glucosidases Constructed by Gene Shuffling: Overexpression and Folding. **4th Symposium on Protein Architecture, Mishima, Japan, 9-10 Dec, 1997.**
 - D-Mannitol-1-phosphate dehydrogenase from *Brochothrix thermosphacta*. **Aust. Biochem. 1985, Australia**

- Role of Pi in the regulation of sugar metabolism in *Brochothrix thermosphacta* (formerly *Microbacterium thermosphacta*). **Aust. Biochem. Soc.** 1985, **Australia**
- Association of Microbiologists of India, Annual Meetings: Attended and presented papers in **1988,1989,1991,1992,1995,2000** held at various places in **India**

Conferences/Workshops/Short-term Courses Organized

- ❖ **Organizing Committee Member:** One Day: Inaugural Event and First Symposium with the award ceremony of the ‘Web of Microbiologists (WoM)’ on 14th November, 2021
- ❖ **Organizing Chairman:** UGC-CAS One Day National Conference on ‘Innovations in Biological Sciences’ organized at the Department of Biosciences, Saurashtra University, Rajkot, 10 January 2020
- ❖ **Organizing Chairman:** UGC-CAS One Day National Conference on ‘New Horizons of Biological Sciences’ organized at the Department of Biosciences, Saurashtra University, Rajkot, 26 February 2019
- ❖ **Organizing Chairman:** DBT-Govt. of India Sponsored National Workshop on ‘Foldscope- Field Microscope’ organized at the Department of Biosciences, Saurashtra University, Rajkot, 18 September 2018
- ❖ **Organizing Chairman:** UGC-CAS Two Day National Conference on ‘Biodiversity and Bioresource Utilization’ organized at the Department of Biosciences, Saurashtra University, Rajkot, 09-10 March 2017
- ❖ **Organizing Chairman/Coordinator:** GIAN (Global Initiatives of Academic Network) Short-term course on ‘Metagenomics & Microbiomes’, 20-25 February 2017 in UGC-CAS Department of Biosciences, Saurashtra University, Rajkot
- ❖ **Organizing Chairman:** UGC-CAS Two Day National Conference on ‘Arid Zone Biology’ organized at the Department of Biosciences, Saurashtra University, Rajkot, 17-18 March 2015
- ❖ **Member Organizing Committee:** Two Day Symposium (ARS-2014) organized at Saurashtra University, Rajkot, January 2014
- ❖ **Member Organizing Committee:** Two Day Symposium (ARS-2013) organized at Saurashtra University, Rajkot, 17-18 January 2013
- ❖ **Member Organizing Committee:** One Day Symposium organized at Saurashtra University, Rajkot, 18 October 2011
- ❖ **Member Organizing Committee:** One Day Symposium organized at Saurashtra University, Rajkot, 11 January 2011
- ❖ **Organizing Chairman /Coordinator:** Two Day Symposium organized at Saurashtra University, Rajkot, 16-17 October 2010
- ❖ **Organizing Chairman /Coordinator:** One Day Symposium organized at Saurashtra University, Rajkot, 12 December 2009
- ❖ **Organizing Chairman /Coordinator:** One Day Symposium organized at Saurashtra University, Rajkot, 05 March 2008
- ❖ **Organizing Chairman:** UGC-DSA National Conference, Bioresources, Utilization and Conservation, Rajkot, India, 17-18 February 2006
- ❖ **Coordinator:** One Day Symposium organized at Saurashtra University, Rajkot, 2005 for BARC Scientists
- ❖ **Biology Session Coordinator:** XVIII Gujarat Science Congress, Saurashtra University, Rajkot.13 March, 2004
- ❖ **Symposium Coordinator (Microbiology):** National Conference on Environmental Biology, 17-18 October 2002, Saurashtra University, Rajkot

Research Projects

Ministry of Earth Sciences, Government of India (2014-2017)

- A Networking project (my component- Rs. 32 lacs) on the “Diversity of the marine actinomycetes from Sea water along the Gujarat Coast

DBT Project

- A Multi-Institutional Project (Rs. 95 lacs) involving myself, Dr. S.K. Khare (Department of Chemistry, IIT Delhi, New Delhi) and Dr. Sanjay Kapur, (University of South Delhi, New Delhi) sanctioned by DBT, Government of India New Delhi on the “Recombinant enzymes from of haloalkalophilic bacteria from Coastal Gujarat, began in August 2007 for 4 years

UGC Projects

- UGC BSR Faculty Fellow Project on “Diversity and biocatalytic potential of haloalkaliphilic bacteria from the saline habitats of Coastal Gujarat: Metagenomic and cultivation-based Approach”, INR 33 Lacs (INR 3.30 Million-Indian Rupees), Year 2020-2023
- Coordinator of UGC sponsored Center of Advanced Studies (UGC-CAS) of Rs. 136 Lacs (13.6 million Indian Rupees), (2013-2018).
- Coordinator of UGC sponsored COSIST Programme of Rs. 58 Lacs (5.8 Million Indian Rupees), (2001-2006).
- Coordinator of UGC sponsored DSA project of Rs. 36 Lacs (3.6 Million Indian Rupees), (2001-2006)
- Minor Project on “Production and Characterization of alkaline protease from haloalkalophilic bacteria”, Year 1998-99
- Minor project on “Biodiversity and enzymatic potential of halophilic and haloalkalophilic bacteria from Kachha and Div region, Year 2000-2001

DST Projects

- **Coordinator** of DST sponsored FIST project of Rs. 55 Lacs (5.5 Million Indian Rupees), (2007-2011)
- **Mentor** for the DST- Sponsored Women Scientist Project to Dr. Aparna Singh of Rs. 28 Lacs (2.8 Million Indian Rupees), (2015-2017).
- **Mentor** and Research Guide for the DST- Sponsored Women Scientist Project to Ms. Kruti Dangar of Rs. 20 Lacs (2.0 Million Indian Rupees), (2012-2015).
- **Mentor** for the DST- Sponsored Young Scientist Project to Dr. Vikram Raval (Rs. 40 Lacs (4.0 Million Indian Rupees), (2016-2018).

- **Mentor** for the SERB- National Post-Doctoral Fellow Dr. Kalpana Rakoholiya (Rs. 20 Lacs (2.0 Million Indian Rupees), (2016-2017).

GSBTM (Gujarat State Biotechnology Mission)

- GSBTM; 0.75 lac on proteins profiling of haloalkaliphilic bacteria, 2005-06

Project in Japan

Project undertaken at National Food Research Institute, Tsukuba Science City, Tsukuba, Japan, Year 1996-98, Yen- 3.0 Million (Rs. 10 lacs) Project on Structure & function analysis through gene shuffling, sponsored by Japan Research and Development Corporation.

ICAR Sponsored Projects: Following projects were undertaken at G. B. Pant University, Pantnagar, India as Assistant Professor **during 1988- 1992**

- Milk Clotting enzymes from Thermophilic mould, 2 years
- Alkaline protease from Alkalophilic bacteria, 2 years
- Beta-Galactosidase from Lactobacillus sp., 2 years
- Impact of Ni-rich effluent on soil fertility, 2years

Research Fellowships to my Ph.D. Students:

National

- DST Young Scientist: 01 (2012-15 and 2015-17)
- SERB- National Post-Doctoral Fellowship: 01 (2016)
- DST-INSPIRE Fellowship-2015
- MoES, Government of India- Junior Research Fellowships: 02 (2015-2017)
- CSIR- Research Associateship (Direct): 01 (2013-2014)
- DST Women Scientist-Project Fellowship: 02 (2012-15 and 2015-17)
- DBT-Research Associateship: 01 (2012)
- UGC-Meritorious Research Fellowship: 06 (2008-2014)
- UGC-Fellowship for OBC: 01 (2018-2021)
- UGC-Research Associateship: 02 (2006 and 2012)
- CSIR-Senior Research Fellowship (Direct): 03 (2010 and 2018)
- DBT-Junior Research Fellowship: 01 (2007-2010)
- DBT Senior Research Fellowship: 01 (2010-2011)
- UGC-DSA Junior Research Fellowship: 04 (2001-2012)
- Gujarat Government Ph.D. Fellowship: 02 (2001-2002)

International

- UNESCO Fellowship, Czech Republic: 02 (1996-97)
- Post-Doc Fellowship, USA and Canada:05 (2000-2012)

- FAOBMB/UNESCO Young Scientist Fellowship: 01 (2000)
- DST-Young Scientist International Travel Fellowship: 06 (2005-2014)
- CSIR- International Travel Fellowship: 03 (2005-2012)
- DBT- International Travel Fellowship: 02 (2005-2012)

Research Collaborations

- Doctoral work at the School of Science, **Griffith University, Brisbane (Australia)** with **Dr. P.J. Rogers** on the metabolic regulation in Gram-positive bacteria was continued (1982-1993)
- **National Food Research Institute, Tsukuba Science City, Japan 305**, with Dr. Kiyoshi Hayashi, Head, Molecular Enzymology Lab, on Protein Engineering (1996--onward)
- **Griffith University, Brisbane, Australia** with Dr. B. K. C. Patel on ,molecular Phylogeny (2003- onward)
- **Indian Institute of Technology, Delhi, India**, With Dr. S. K. Khare at the Department of Chemistry (2000- onward)
- **University of Delhi South Camps, Delhi, India**, With Dr. Sanjay Kapor at the Department of Plant Molecular Biology (2007- onward)
- **Central University of Hyderabad** with Prof. Ch. Ramana Rao (2015- onward)
- **Jawaharlal Nehru Technological University, Hyderabad**, with Prof. Ch. Sasikala (2015- onward)

Memberships of Professional Bodies

- Member, American Society of Microbiology (ASM) 2004, 2018.2019.2020, 2021, 2022, 2023
- International Society for Extremophiles : 2002-2003
- Biotechnology Research Society India (BRSI) : Life Member
- Society of Biological Chemists (SBC), India ; Life member
- Association of Microbiologists of India (AMI) ; Life member
- Biotechnological Society of India, India ; Life member
- Australian Biochemical Society (ABS) ; Ex- member
- Japan Society for Bioscience, Biotechnology and agrochemistry; Ex- Member

Profile of the Ph.D. Students

Ph.D. Students (Year of Ph. D.)	Current Status	Distinctions
Dr. Bharat Joshi (1995)	Research Faculty, University of British Columbia, Canada	<ul style="list-style-type: none"> ➤ UNESCO Fellowship, Czech Republic (1996) (Completed PhD from Czech Republic) ➤ Post-Doc Fellow, USA ➤ Post-Doc Fellow, Canada
Dr. Manish Bhatt (1996)	Scientist, Canada	<ul style="list-style-type: none"> ➤ UNESCO Fellowship, Czech Republic (1997), (Completed PhD from Czech Republic) ➤ Post-Doc Fellow, Germany ➤ Post-Doc Fellow, Canada
Dr. Rajesh K. Patel (2002)	Professor, Veer Narmad University of South Gujarat, Surat	<ul style="list-style-type: none"> ➤ FAOBMB/UNESCO Young Scientist Fellowship to present paper in China (2000); ➤ UNESCO Fellowship to attend a workshop on RNA Molecular Biology in China (2001);

		<ul style="list-style-type: none"> ➤ National University Singapore Fellowship to attend a workshop on Bioinformatics (2005) ➤ Research Publications: 04
Dr. Anju Mittal (2002)	Post-Doc Fellow and Scientist, USA	<ul style="list-style-type: none"> ➤ Senior Research Fellow, DBT (India) ➤ Scientist, USA
Dr. Mital S. Dodia (2005)	Scientist, R&D, Canada	<ul style="list-style-type: none"> ➤ Gujarat State Merit Fellowship (2001-2003); ➤ JRF (2003- 05, at Saurashtra University); ➤ Research Associate (November 2005-June 2006, at Saurashtra University; ➤ DBT International Travel Fellowship to present Paper in Australia, 2005); ➤ Young Scientist Fellowship (2006) (International Society of Extremophiles) ➤ CSIR International Travel Fellowship to present Paper in France, 2006) ➤ Research Publications: 04
Dr. Rupal H. Joshi (2006)	Scientist, R&D, and group leader, Zydus Research Centre, Ahmedabad	<ul style="list-style-type: none"> ➤ Gujarat State Merit Fellowship (2001-2003) ➤ Part-time lecturer, Biochemistry, Saurashtra University, Rajkot (2002-07) ➤ Post-doctoral Fellowships (2006-07) ➤ Lecturer, Biotechnology, Meerut Institute of Technology, Meerut (2007-08) ➤ Research Publications: 02
Dr. Jignasha. T. Thumar (2007)	Assistant Professor, Gouvernement Science College, Gandhinagar, Gujarat	<ul style="list-style-type: none"> ➤ DST International Travel Fellowship to present Paper in South Africa, 2008 ➤ UGC Young Scientist-Minor Research Project (2008-10) ➤ DBT Major Research Project, about 35 lacs, 2011
Dr. Chetna Rajyaguru (2008)	Associate Professor, M.V.M Science Collège, Rajkot	Associate Professor, M.V.M Science Collège, Rajkot
Dr. Geera Mankad (2009)	Associate Professor, M.V.M Science Collège, Rajkot	Associate Professor, M.V.M Science Collège, Rajkot
Dr. Himansu Bhimani (2011)	Associate Professor, Navsari Agriculture University, Navsari, Gujarat	<ul style="list-style-type: none"> ➤ Title of the thesis: Bacterial degradation of azo dyes and its derivatives ➤ Lecturer (05 Years- Continue): Girls College, Amreli ➤ Conference Presentation:02 ➤ Conferences Attended:02
Mr. Sandeep Pandey (2012)	R& D, Pfizer Pharmaceutical Industry, Aurangabad, Maharashtra Currently at: R & D. USV Pharmaceutical, Daman	<ul style="list-style-type: none"> ➤ Title of the thesis: Stability and activity of enzymes from Halophilic and Haloalkaliphilic bacteria in the presence of organic solvents. ➤ Fellowships: 04: DSA-JRF Fellowship (1 year); UGC Meritorious Fellowship (2 Years-continue); Research Scholar UMDNJ New Jersey (USA); Student non-Degree UMDNJ, New Jersey (USA) ➤ Research Publications: 02 ➤ Book Chapters:02 ➤ Conference Presentationss:07 ➤ Conferences Attended:04 ➤ Workshop/Training: 02 (BARC, Mumbai and IAR, Gandhinagar)
Dr. Sangeeta Gohel (2012)	Assistant Professor, Dept. of Biosciences, Saurashtra University, Rajkot	<ul style="list-style-type: none"> ➤ Title of the thesis: Molecular Diversity and biotechnological potential of halotolerant and haloalkaliphilic actinomycetes from saline habitats along the coastal Gujarat ➤ Fellowships: UGC-Meritorious Fellowship (3 Years), UGC-Research Fellowship (2012), CSIR-Research Associateship (2013) ➤ Research Publications: 05

		<ul style="list-style-type: none"> ➤ Book Chapters:02 ➤ Conferences Presentation:06 ➤ Conferences Attended: 06 ➤ Workshops/Training: 01 (IIAR, Gandhinagar)
Dr. Megha Purohit (2012)	DBT Research Associateship, V.N. University of South Gujarat, Surat, and Currently in Canada as a Scientist & Science Entrepreneur	<p>Title of the thesis: Cloning, Over-expression and Characterization of alkaline proteases from cultivable and non- cultivable Halophilic and/or Haloalkaliphilic bacteria isolated from saline habitats of Coastal Gujarat</p> <p>Lab Technician (01 Years): M.Sc. Biotechnology Programme, Saurashtra University, Rajkot</p> <p>Lecturer (03 Years): M.Sc. Biotechnology Programme, Saurashtra University, Rajkot</p> <p>Fellowships: CSIR-SRF (2010- 12), DBT-IISC Bangalore Research Associateship: from January 2012</p> <p>Research Publications: 08 in refereed Journal</p> <p>Book Chapters:05</p> <p>Conference Presentations:07</p> <p>Conferences Attended:07</p> <p>Workshops/Training: 02 (Delhi University South Campus; IIAR, Gandhinagar)</p>
Dr. Chirantan Rawal (2013)	Assistant Professor in Government College, Silvassa (UT)	<p>Title of the thesis: Cloning, Overexpression and characterization of alkaline protease from Halophilic/Haloalkaliphilic Bacteria</p> <p>Lab Technician (01 Years): M.Sc. Biotechnology Programme, Saurashtra University, Rajkot,</p> <p>Teaching Assistant (02 Years): M.Sc. Biotechnology Programme, Saurashtra University, Rajkot,</p> <p>CSIR-NET (June 2013)</p> <p>Lecturer (03 Years- Continue): Microbiology/Biotechnology, Christ College, Saurashtra University, Rajkot,</p> <p>Research Publications:05</p> <p>Book Chapters:02</p> <p>Conference Presentations:04</p> <p>Conferences Attended:04</p> <p>Workshops/Training: 01 (BARC, Mumbai)</p>
Dr. Vikram Raval (2013)	Assistant Professor, Department of Microbiology & Biotechnology, Gujarat University, Ahmedabad, Previously, DST-SERB Young Scientist at Saurashtra University, Rajkot	<p>Title of the thesis: Biochemical characterization and molecular studies on the alkaline proteases from haloalkaliphilic bacteria isolated from Gujarat Coasts.</p> <p>Fellowships: DBT-JRF (02 Years), DBT-SRF, DST-SERB Young Scientist</p> <p>Research Publications: 07</p> <p>Book Chapters:04</p> <p>Conferences Presentations: 04</p> <p>Conference Attended: 05</p> <p>Workshop/Training: 03 (IIAR, Gandhinagar; IIT Delhi; I.I.Sc. Bangalore)</p>
Dr. Bhavtosh A. Kikani (2013)	Assistant Professor CHARUSAT, Changa Gujarat	<p>Title of the thesis: Molecular Diversity and Biocatalytic Potential of Thermophilic and thermotolerant bacteria from a hot spring reservoir in Tulasi Shyam, Junagadh, (Gujarat)</p> <p>Lecturer (02 Years- continue): M.Sc. Biotechnology Program, Saurashtra University, Rajkot</p> <p>Fellowship: DST International Travel Award (02); CSIR International Travel Award, CSIR-SRF (2012- Continue)</p> <p>Research Publications: 04</p> <p>Book Chapters:02</p> <p>Conference Presentation:05</p> <p>Conference Attended: 05</p> <p>Workshop/Training: 01 (IIAR, Gandhinagar)</p>
Ms. Viral Akbari (2015)	Scientist in Pharmaceutical Company, UK	<p>Title of the thesis: Molecular Diversity, Biodegradation Efficiency and Bioremediation Strategies of Pyrene degrading bacteria</p> <p>Fellowship: UGC-Meritorious Fellowship</p>

		Research Publications: 03 Book Chapters: 01 Conference Presentation: 05 Conference Attended: 05 Workshop/Training:
Mr. Rushit Shukla (2016)	Assistant Professor Christ College, Rajkot	Title of the thesis: Diversity and Enzymatic potential of Thermophilic actinomycetes Fellowship: Research Publications: 03 Book Chapters: 02 Conferences Presentation: 05 Conferences Attended: 05 Workshop/Training: One Week-Workshop on Electron Microscopy at the Junagadh Agricultural University (2012)
Mr, Amit Sharma (2018)	Scientist, Zydus Research Centre, Ahmedabad	Title of the thesis: Diversity of Haloalkaliphilic actinomycetes from the seawater of Gujarat Coast Fellowship: 1. IQAC Dissertation Scholarship, Saurashtra University 2. UGC Meritorious-JRF (04 Years) Research Publications: 02 Book Chapters: 02 Conference Presentations: 03 Conferences Attended: 03 Workshop/Training: 01 (Training on the tools applied in the molecular diversity at CSMCRI, CSIR, Bhavnagar)
Ms. Kruti Dangar (2019)	Assistant Professor, Saurashtra University, Rajkot	Title of the thesis: Cultivable and non-cultivable actinomycetes from the saline habitats of Coastal Gujarat Fellowship: DST Women Scientist Project (2012-2014), UGC.DSA JRF Research Publications: 02 Book Chapters: 01 Conference Presentations: 04 Conferences Attended: 04 Workshops/Training: 01 (SICART, Vidyanagar, Gujarat, Training on NMR, EM, and other spectroscopic Techniques)
Mr. Atman Vaidya (2019)	Working in School as Biology Teacher, Rajkot Grades: 10-12	Title of the thesis: Stability of the enzymes from Extermophilic bacteria Fellowship: ----- Research Publications: 01 Book Chapters: Conference Presentation: 03 Conference Attended: 03 Workshop/Training:
Ms. Rupal D. Pandya (2020)	Working in USA	Title of the thesis: Molecular Diversity and Biocatalytic potential of Halophilic/Haloalkaliphilic Archaea from the saline habitats of arid /semi arid zones of Kutch, Gujarat, India CSIR-NET Cleared Fellowship: UGC Meritorious-JRF (04 Years) Research Publications: 01 Conferences Presentation: 04 Conferences Attended: 08
Ms. Foram Thakkar (2020)		Title of the thesis: Molecular studies on the alkaline proteases of the Haloalkaliphilic actinomycetes isolated from saline habitats of the Gujarat coast Fellowship: UGC Meritorious-JRF (05 Years) Research Publications: 04 Book Chapters: 02 Conference Presentations: 05 Conferences Attended: 05 Workshops/Training: 02

Mr. Hitarth Bahtt (2020)	Assistant Professor, Atmiya University, Rajkot	Title of the thesis: Molecular and enzymatic diversity of haloalkaliphilic/ haloalkalitolerant bacteria from the little Rann of Kutch, Gujarat Fellowships: UGC Meritorious-JRF (03 Years), CSIR-Direct SRF (2018-2019) Research Publications: 05 Book Chapters: 03 Conference Presentation: 06 Conference Attended: 07 Workshop/Training: 2
Mr. Daleep Singh Rathore (registered in 2018, No.18026)	Research Associate, Gujarat Biotechnology Research Institute, Gandhinagar, Gujarat	Title of the thesis: Diversity and Biocatalytic aspects of cultivable marine actinomycetes from the pristine Kachhigadhi along the Gujarat Coast. Fellowship: MoES Fellowship CSIR-NET, GSET, ICAR NET, GATE Research Publications: 05 Book Chapters: 02 Conference Presentations: 05 Conferences Attended: 05 Workshop/Training: 03
Ms. Nirali Raiyani (Registered in 2015, No. 15033) (Thesis Submitted on 19 December 2021, VIVA on 12.4.2022)	Assistant Professor, R K University	Title of the thesis: Culture independent diversity and biocatalytic potential of haloalkaliphilic bacteria in salt enriched soil and sea water of coastal Gujarat. Fellowship: DST INSPIRE Fellowship Research Publications: 03 Book Chapters: 01 Conference Presentation: 06 Conference Attended: 06 Workshop/Training: 03
Ms. Sheikh Mahejbin (Registered in 2016, No.16759) (Thesis Submitted on 05 January 2022, VIVA on 06 June 2022)	Visiting Faculty	Title of the thesis: Molecular diversity and enzymatic potential of Actinomycetes from the sea water of Alang near Bhavnagar coast. Fellowship: MoES Fellowship and UGC-Fellowship for OBC Research Publications: 03 Book Chapters: 01 Conference Presentations: 03 Conferences Attended: 03 Workshops/Training: 03

Ph.D. Students Currently Working

<i>Ph.D. Students (Year of Ph. D.)</i>	<i>Distinctions</i>
Ms. Ankita Dobariya (Registered in 01 December 2020, No. 21220)	Title of the thesis: Production, Characterization and application of amylase from Haloalkaliphilic actinomycetes of marine origin Fellowship: SHODH Fellowship Research Publications:01 Book Chapters: 01 Conference Presentations: 04 Conferences Attended: 04 Workshops/Training: 04
Ms. Hasti Ramavat (Registered, No. 22103, Dated 01 January 2022)	Title of the thesis: Cloning, expression and characterization of recombinant amylases from haloalkaliphilic bacteria/ actinomycetes Fellowship: SHODH Fellowship Research Publications: 01 Book Chapters: 01

Conference Presentations: 02 Conferences Attended: 03 Workshops/Training: 02
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RESEARCH HISTORY AND BRIEF SUMMARY

Structure and Function Relationship: Gene Shuffling

Construction, over expression and protein folding of chimeric β -glucosidase and cellobiose phosphorylase by shuffling varying regions of the structural genes involving mesophilic, thermophilic and hyperthermophilic bacteria followed by structure & function analysis of these enzymes.

With: Dr. Kiyoshi Hayashi, National Food Research Institute, Tsukuba, Japan; **1996-Continue**

Microbial diversity and Extracellular Enzymes among Extremophiles:

Organisms from halophilic, alkaliphilic and haloalkaliphilic groups, microbial heterogeneity; extracellular enzymes; production optimization; purification and characterization of the enzymes; *in-situ* production and extraction of enzymes employing aqueous 2-phase systems; protein renaturation/folding; Molecular diversity; cloning & expression of enzymes from halophilic bacteria. **1986- Continue**

Enzymology and plasmid profile in *Lactobacillus acidophilus*. 1986-1990

Metabolic regulation in Gram-positive bacteria:

Studies on a major component of spoilage microflora, *Brochothrix thermosphacta* (formerly *Microbacterium thermosphactum*) present on packaged meat products. In view of the economic importance, I took an analysis of the glucose transport and metabolism in this organism. The *in-vitro* enzymatic analyses coupled with *in-vivo* high field NMR studies were taken to elucidate the mechanisms of the sugar transport and nature and control of the competing fermentation pathways. Studies with both whole cells and membrane vesicles revealed the understanding of the membrane associated energy-yielding reactions.

At the School of Science, Griffith University, Brisbane (Australia) with Dr. P.J. Rogers. **1982-1995**

Biological Nitrogen Fixation:

Use of Rhizobia and blue green bacteria as biofertilizer. At N.D. University of Agriculture & Technology, Faizabad, India July 1980 - July 1981

Nitrogen fixation in non-legumes. At the School of Environmental Sciences, JNU, New Delhi, India. **July 1981 - March 1982.**

Methanogenesis:

On the effect of photosynthetic and cellulolytic bacteria on methane and hydrogen production. M.Sc. Thesis at G.B. Pant University, Pantnagar, India. **July 1977 - June 1980.**

AREAS

1. Protein Engineering Through Gene Shuffling

Structure & function analysis of β -glucosidases and Cellobiose phosphorylase from *Cellvibrio gilvus*, *Agrobacterium tumefaciens* & *Thermotoga maritima*

- Gene Shuffling
- Over Expression
- Protein Solubilization
- Enzyme Purification
- Enzyme Characterization

2. Microbes from Extreme Environments

Psychrotroph & Gram positive Facultative Anaerobe

Metabolic Regulation: Enzymatic & High Field NMR

Microbial Enzymes and their characterization from Thermophilic, Alkalophilic, Haloalkalophilic Bacteria & Actinomycetes

It is widely accepted that extremophilic microbes will provide a valuable resource not only for the exploitation in novel biotechnology process but also as a model for investigating new biomolecules and factors that stabilize them under extreme conditions. Since the member of extremophilic organisms currently in culture are limited, it is of great value to discover new organisms by developing suitable enrichment techniques from varied man-made and natural habitats. Diversity and biocatalytic potential of non-cultivable halophilic bacteria under the umbrella of the metagenomics is also being pursued. It's this theme in mind that we are currently investigating halophilic and haloalkalophilic bacteria and actinomycetes from the saline and hypersaline locations along the Coastal Gujarat in the Western India. This is in addition to my research work with Dr. Hayashi from National Food Research Institute (NFRI), Tsukuba, Japan on the structure and functional analysis of β -glucosidase from a moderate and highly thermophilic bacteria through gene shuffling.

Aspects under investigation include:

- **Structure and functional analysis of β -glucosidase from a moderate and a highly thermophilic bacteria through gene shuffling**
- **Exploration of the microbial diversity under extreme environments**
- **Enzymatic potential of halophilic and haloalkalophilic bacteria and actinomycetes isolated from saline and hypersaline locations**
- **Occurrence of extracellular protease and other enzymes among the microbial population**
- **Many proteases from the Haloalkalophilic bacteria and actinomycetes have been purified and characterized during the last several years for the enzyme catalysis, stability and Structure & Function relationship. Many unique features have been identified and are being further explored. Cloning and over-expression of the protease genes are being carried out. This work was sponsored by a multi-institutional project from DBT, Government of India (2007-2012) and is being further pursued under the umbrella of a multifaceted project from the University Grant Commission, New Delhi, India.**

- **Characterization of protease with particular reference to factors stabilizing these enzymes. Towards this end, protein folding under in-vitro conditions is also being investigated. The results indicate that the denatured proteases and other enzymes could be successfully refolded by the different methods of the dialysis**
- **Biochemical and molecular basis for the halophily and investigating strategies for adaptation**
- **Cloning, sequencing and over expression of the saline- tolerant proteases from the non-cultivable halophilic bacteria from the saline habitats of Coastal Gujarat in India under the umbrella of Metagenomics is also being pursued.**

Summary

Protein Engineering through Gene Shuffling

Structure & function analysis of β -glucosidases from *Cellvibrio gilvus* (CG), *Agrobacterium tumefaciens* (AT), and *Thermotoga maritima* (TM) was investigated through Gene Shuffling and PCR based random mutagenesis.

- 1. Over expression and Solubilization of β - Glucosidase from *Cellvibrio gilvus* (CG) and *Agrobacterium tumefaciens* (AT)**
- 2. Importance of C-terminal and C domain in enzyme stability and folding**
- 3. Genetic chimeras:** Various kinds of genetic chimeras based on gene shuffling were constructed and over produced in pET vector.
- 4. Inclusion Bodies:** The overexpressed proteins were trapped in inclusion bodies and while native enzymes were solubilized, the chimeric proteins were not solubilized by the coexpression of molecular **chaperons, Gro EL/ES.**
- 5. PCR based random mutagenesis (error prone PCR approach) was adapted.** Mutation in few amino acids induced solubilization of overexpressed chimeric β -glucosidase.
- 6. In-vitro Protein Renaturation:** Simple, slow & Resin bound dialysis and A FPLC based folding method was developed for in-vitro protein folding
- 7. Cellobiose phosphorylase gene from *Cellvibrio gilvus* was cloned, sequenced and overexpressed. The highly GC rich open reading frame codes for 818 amino acids. The Solubilization of overexpressed gene was successfully attempted by **low growth temperature and low induction****
- 8. Functional attributes of β -glucosidase from highly thermophilic bacteria, *Thermotoga maritima*. Genetic chimeras of β -glucosidase from *T. maritima* and *A. tumefaciens* were constructed by over-lapping PCR approach and over expressed in pET vector. The activity and folding depended on the extent of shuffling from C-terminal region**

Psychrotroph & Gram positive Facultative Anaerobe

Brochothrix thermosphacta (formerly *Microbacterium thermosphactum*) present on packaged meat products.

Analysis and Regulation of the glucose transport

Nature and control of the competing fermentation pathways. Membrane associated energy - yielding reactions.

Approaches

The in-vitro enzymatic analyses coupled with *in-vivo* high field NMR studies. Membrane Transport with radioactive probes, electron microscopy (SEM and freeze fractured techniques) towards establishing the orientation of isolated membranes

Research Summary

1. Homolactic fermentation with excess glucose.
Mixed acid Fermentation with glucose-limited slow growth
2. Oxygen sensitive PFL plays key role in fermentation switch
3. Glucose transported through PTS is under regulation of membrane potential (threshold PMF -50mV). Membrane potential dependent glycine transport
4. Glycolytic flux regulated by cytoplasmic pH & Adenylate charge: Pyruvate kinase key enzyme
5. Fr-6-P \Rightarrow Mno-1-P-by-Mno-1-P DH: Key role in Redox balance, at low pH and slow growth rate
6. Mannitol uptake by PEP-PTS and vectorial transphosphorylation of glucose by mannitol - 1- P

Thermophilic Fungi

***Malbranchea pulchella* var. *sulfurea*, a thermophilic mould**

- Isolation, Maintenance & Regeneration of Protoplast
- Production of Extracellular Polysachharases & Enzyme characterization
- Enzyme stability at 50-60C

Alkaliphilic Bacteria

- *Bacillus* sp. Isolated from alkaline soil and screened for Protease

- Optimisation of alkaline Protease for carbon, nitrogen other nutritional Factors. Corn steep liquor emerged as the best carbon as well as nitrogen source.
- **Nitrogen Repression** of Protease synthesis
- **Catabolic Repression** by Glucose Enzyme production decreased at higher Glucose level (> 0.1%)
- Inorganic phosphate and cations (Ca^{2+} , Mg^{2+} , and Mn^{2+}) stimulated both **enzyme production and catalysis**.
- **Thermal stability** was enhanced by these **Cations**.
- ***In situ* enzyme production** was investigated with **PEG-6000 and salt based aqueous two-phase systems**.
- **Enzyme Purification** by aqueous 2-phase system, gel permeation and affinity chromatography (**56-fold**). The apparent MW was **29,000** and appears to be a **monomer**
- The Temperature & pH optima 35C & 11. Enzyme was stable at pH 10-11 for 60 Min

Halophilic & Haloalkalophilic Bacteria & Actinomycetes

Alkalophilic, halophilic and haloalkalophilic bacterial and actinomycetes isolated from various regions of **Coastal Gujrat** were investigated for their ability to secrete **amylase, lipase and protease**. The enzymes were characterised with reference to temperature and pH optima, temperature stability. Studies on enzyme production, purification and characterisation are continued.

Research Summary

1. **Extracellular Protease** Production occurs widely among **halophilic and haloalkalophilic bacterial and actinomycetes**. **Amylase** is less frequently detected
2. **PH Effect:** Alkaline Protease from **Alkalophilic & haloalkalophilic bacterial and actinomycetes produce proteases optimally at 10 pH**
3. **Salt Effect:** Haloalkalophilic bacterial and actinomycetes produce proteases optimally at salt concentration above 10%
4. **Carbon sources:** Theses microbes have wide capacity to use range of carbon sources for growth as well as enzyme production
5. **Nitrogen Repression** of Protease synthesis with both inorganic & organic N-sources
6. **Amino acids as carbon & N-sources. Repression beyond a threshold limit**

7. ***In-vitro* protein folding, renaturation, of denatured enzymes** as affected by salt and other factors are under current investigation. Early indications are that salt tolerant and alkaliphilic proteases could be successfully folded by slow dialysis. This aspect carries significant biotechnological ramifications. **More recently, the work on protein denaturation has highlighted the existence of highly resistance enzymes against chemical denaturation**

8. **The studies on the enzymatic catalysis by the proteases and lipases** from haloalkalophilic organisms are being collaborated by our group and Dr. S.K. Khare from the Indian Institute of Technology, New Delhi, India.

Many proteases from the Haloalkaliphilic bacteria and actinomycetes have been purified and characterized during the last several years for the enzyme catalysis, stability and Structure & Function relationship. Many unique features have been identified and are being further explored. Many protease genes from Haloalkaliphilic bacteria and actinomycetes have been cloned, expressed and characterized. The work has been sponsored by a multi-institutional project from DBT, Government of India (2007-2012), UGC-CAS Program, MoES Networking Project and DST projects.