



Faculty Details proforma for DU Web-site

Title	Dr.	First Name	Rani	Last Name	Gupta	Photograph
Designation		Professor				
Address		Department of Microbiology, University of Delhi, South Campus				
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Residence		-				
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Educational Qualifications						
Degree		Institution			Year	
Ph.D. (Botany)		University of Delhi			1983	
M. Phil		University of Delhi			1979	
M.Sc		University of Delhi			1978	
B.Sc		University of Delhi			1976	
Career Profile						
Organisation / Institution			Designation	Duration	Role	
Department of Microbiology, University of Delhi South Campus, New Delhi.			Professor	1988-till date	Research & Teaching	
Various colleges of University of Delhi.			Assistant Professor	1983- 88	Research & Teaching	
Department of Biochemical Engineering and Biotechnology, I.I.T., New Delhi. Senior			Senior Associate	1997-1998	Research	
Administrative Assignments						
<ul style="list-style-type: none"> • External expert for Institutional Biosafety Committee (IBSC) at IIT, Delhi • Member Governing Committee of University colleges • Chairperson of Governing Committee, Geetanjali Hostel, UDSC 						
Areas of Interest / Specialization						
<ul style="list-style-type: none"> • Microbial enzymes of industrial applications: Developing process for cost effective fermentation and downstream processing • Cloning and expression of industrially useful enzymes • Protein engineering for improving biocatalytic properties of enzymes 						

- Immobilization of enzymes and their use in biotransformations

Subjects Taught

Microbial Physiology and Metabolism, Prokaryotic and eukaryotic diversity, Environmental Microbiology, Practical aspects of techniques used in biochemistry and enzymology, Physiology and Environmental Microbiology

Research Guidance

Supervision of awarded Doctoral Thesis: 18

Supervision of Doctoral Thesis, under progress: 3

Publication Profile (last 5 years)

1. Dua, A., Faridi, S., Kashyap, A., & Gupta, R. (2018). Characterization of a novel thiol activated phospholipase TAPLB1 from *Trichosporon asahii* MSR 54. *International journal of biological macromolecules*, 120, 537-546. doi.org/10.1016/j.ijbiomac.2018.08.120
2. Bindal, S. Dagar, V.K. Saini, M. Khasa, Y.P. & Gupta, R. (2018) High level extracellular production of recombinant γ -glutamyl transpeptidase from *Bacillus licheniformis* in Escherichia coli fed-batch culture, 116, 23-32. doi: 10.1016/j.enzmictec.2018.05.004
3. Dua, A., & Gupta, R. (2017). Functional characterization of hormone sensitive-like lipase from *Bacillus halodurans*: synthesis and recovery of pNP-laurate with high yields. *Extremophiles*, 21(5), 871-889. doi: 10.1007/s00792-017-0949-8.
4. Syal, P., Verma, V.V., Gupta, R. (2017). Targeted mutations and MD simulations of a methanol-stable lipase YLIP9 from *Yarrowia lipolytica* MSR80 to develop a biodiesel enzyme. *International Journal of Biological Macromolecules*, 104(Part A): 78-88. doi: 10.1016/j.ijbiomac.2017.06.003
5. Kumari, S., Pal, R.K., Gupta, R., Goel, M. (2017). High Resolution X-ray Diffraction Dataset for *Bacillus licheniformis* Gamma Glutamyl Transpeptidase-acivicin complex: SUMO-Tag Renders High Expression and Solubility. *The Protein Journal*, 36(1), 7-16. doi: 10.1007/s10930-017-9693-2
6. Bindal, S., Sharma, S., Singh, T.P., Gupta R. (2017). Evolving transpeptidase and hydrolytic variants of γ -glutamyl transpeptidase from *Bacillus licheniformis* by targeted mutations of conserved residue Arg109 and their biotechnological relevance. *Journal of Biotechnology*, 249, 82-90. doi: 10.1016/j.jbiotec.2017.03.034
7. Bindal, S., Gupta, R. (2017). Hyperproduction of γ -glutamyl transpeptidase from *Bacillus licheniformis* ER15 in the presence of high salt concentration. *Preparative Biochemistry and Biotechnology*, 47(2), 163-172. doi: 10.1080/10826068.2016.1188314
8. Saini, M., Bindal, S., Gupta, R. (2017). Heterologous expression of γ -glutamyl transpeptidase from *Bacillus atrophaeus* GS-16 and its application in the synthesis of γ -D-glutamyl-L-tryptophan, a known immunomodulatory peptide. *Enzyme Microbiology and Technology*, 99, 67-76. doi: 10.1016/j.enzmictec.2017.01.003
9. Syal, P., Gupta, R. (2017). Heterologous expression of lipases YLIP4, YLIP5, YLIP7, YLIP13 and YLIP15 from *Yarrowia lipolytica* MSR80 in *E. coli*: Substrate specificity, kinetic comparison and enantioselectivity. *Biotechnology and Applied Biochemistry*. doi:10.1002/bab.1542
10. Bindal, S., Gupta, R. (2016). Thermo- and salt-tolerant chitosan cross-linked γ -glutamyl

- transpeptidase from *Bacillus licheniformis* ER15. *International Journal of Biological Macromolecules*, 91, 544-553. doi: 10.1016/j.ijbiomac.2016.05.106
11. Singh, Y., Gupta, N., Verma, V.V., Goel, M., Gupta, R. (2016). Selective disruption of disulphide bonds lowered activation energy and improved catalytic efficiency in TALipB from *Trichosporon asahii* MSR54: MD simulations revealed flexible lid and extended substrate binding area in the mutant. *Biochemical and Biophysical Research Communications*, 472(1), 223-30. doi: 10.1016/j.bbrc.2016.01.189
 12. Singh, Y., Gupta, R. (2015). Novel S-enantioselective lipase TALipB from *Trichosporon asahii* MSR54: Heterologous expression, characterization, conformational stability and homology modelling. *Enzyme and Microbial Technology*, 83, 29-39. doi: 10.1016/j.enzmictec.2015.11.003
 13. Syal, P., Gupta, R. (2015). Cloning, Expression, and Biochemical Characterization of an Enantioselective Lipase, YLIP9, from *Yarrowia lipolytica* MSR80. *Applied Biochemistry and Biotechnology*, 176(1), 110-124. doi: 10.1007/s12010-015-1561-y
 14. Gupta, R., Kumari, A., Syal, P., Singh, Y. (2015). Molecular and functional diversity of yeast and fungal lipases: Their role in biotechnology and cellular physiology. *Progress in Lipid Research*, 57, 40-54. doi: 10.1016/j.plipres.2014.12.001
 15. Arti, A., Baronian, K., Kunze, G., Gupta, R. (2015). Extracellular expression of YLip11 with a native signal peptide from *Yarrowia lipolytica* MSR80 in three different yeast hosts. *Protein expression and purification*, 110, 138-14. doi: 10.1016/j.pep.2015.02.016
 16. Verma, V.V., Gupta, R., Goel, M. (2015). Phylogenetic and evolutionary analysis of functional divergence among Gamma glutamyl transpeptidase (GGT) subfamilies. *Biology Direct*, 14, 10:49. doi: 10.1186/s13062-015-0080-7.
 17. Kumari, A., Gupta, R. (2014). Functional characterisation of novel enantioselective lipase TALipA from *Trichosporon asahii* MSR54: sequence comparison revealed new signature sequence AXSXG among yeast lipases. *Applied Biochemistry and Biotechnology*, 175(1), 360-71. doi: 10.1007/s12010-014-1268-5
 18. Bindal, S., Gupta, R. (2014). L-Theanine synthesis using γ -glutamyl transpeptidase from *Bacillus licheniformis* ER-15. *Journal of Agricultural and Food Chemistry*, 62(37), 9151–9159. doi: 10.1021/jf5022913
 19. Kumari, A., Gupta, R. (2014). Functional characterization of a novel aspartic acid rich lipase, TALipC, from *Trichosporon asahii* MSR54: Solvent-dependent enantio inversion during esterification of 1-phenylethanol. *Biotechnology Letters*, 37(1), 121-130. doi: 10.1007/s10529-014-1648-5
 20. Kumari, A., Gupta, R. (2014). Novel strategy of using methyl esters as slow release methanol source during lipase expression by mut+ *Pichia pastoris* X33. *PLoS ONE*, 9(8), e104272. doi:10.1371/journal.pone.010 427

Conference Organization/ Presentations (in the last three years)

- Association of Microbiologists of India, Lucknow, November 16-19, 2017
- Association of Microbiologists of India, Guwahati, November 24-27, 2016
- OMICS International 7th Indo-Global Summit and Expo on Food & Beverages, New Delhi, October 2015

- Bioworld 2014: Protein Structure and Function, IIT Delhi, 12-14th December 2014
- National Conference on Application of the derivatives of chitin and chitosan, Gandhigram, Tamil Nadu, August 22nd-23rd, 2014

Research Projects (Major Grants)

Name of Project: Process development for enzymatic synthesis of L-theanine, a nutraceutical using gamma-glutamyl transpeptidase from *Bacillus licheniformis*

Period: 2018-2021

Funding Agency: DRDO

Grant: 33.14 lakhs

Name of Project: Engineering *Pichia pastoris* platform to address catabolite repression and methanol usage for AOX1-guided expression: Strain development for efficient utilization of methanol substitutes in a glycerol-independent system

Period: 2017-2020

Funding Agency: DBT

Grant: 45.5 lakhs