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**Research Interests: Mass spectrometry, chemical modification of proteins & chemical proteomics**

Our group's research activity involves developing mass spectrometric application for the proteomic research, as well as to understand the molecular mechanisms of biological process using proteomic approaches. Currently we are working on proteomics of diabetic complications where in we are trying to elucidate the role of glycated proteins and advanced glycation end products (AGEs) in developing diabetic complication. The long term goal of this project is to identify a diagnostic marker for diabetic complications, identify drug targets and develop intervention strategies. Additionally, we are working on identification of off- targets of drugs for repositioning in novel applications, as well as to understand the molecular mechanism of their toxicity, using combination of approaches involving chemical proteomics, two dimensional electrophoresis and mass spectrometry.

Education/Positions

- PhD, 2002, University of Agricultural Sciences, Bangalore.
- Scientist Consultant, 2001-02, Monsanto Research Center, Bangalore.
- Research Associate, 2002-03, CCMB, Hyderabad.
- Post-Doctoral Fellow, 2004, Genome Institute of Singapore, Singapore
- Scientist, 2004-to date, CSIR-National Chemical Laboratory, Pune.

Award:

- NCL Research Foundation - Scientist of the year 2010
- Elected as Young Associate of Maharashtra Academy of Sciences, 2007
- Executive council member of Proteomics Society, India from 2009

Publications (30):

1. 'Synergistic action of flavin containing NADH dependant azoreductase and cytochrome P450 monooxygenase in azoaromatics mineralization. Chetan C. Oturkar CC, Othman MA, Kulkarni MJ, Madamwar D, Gawai kR : RSC Advances (2013) (in press)
2. 'Zoom in' - A targeted database search for identification of glycation modifications analyzed by untargeted tandem mass spectrometry" Bhonsle HS, Korwar AM, Suresh KK, Bhosale SD Bansode SB, **Kulkarni MJ***. EJMS (2013) (accepted)
3. Glycated proteome: from reaction to intervention. **Kulkarni MJ***, Korwar AM, Mary S, Bhonsle HS, Giri AP. Proteomics Clinical Applications (in press)

4. Stress inducible proteinase inhibitor diversity in *Capsicum annuum*. Mishra M, Mahajan N, Tamhane VA, **Kulkarni MJ**, Baldwin IT, Gupta VS, Giri AP. *BMC Plant Biol.* 2012 Nov 16;12(1):217. [Epub ahead of print]
5. Proteomic analysis of protease resistant proteins in the diabetic rat kidney. Bansode SB, Chougale AD, Joshi RS, Giri AP, Bodhankar SL, Harsulkar AM, **Kulkarni MJ***, . *Mol Cell Proteomics.* 2012 Nov 1. [Epub ahead of print]
6. Proteomic profiling and interactome analysis of ER positive/ HER2/neu negative invasive ductal carcinoma of the breast: Towards proteomics biomarkers. Korwar AM, Bhonsle HS, Ghole VS, Gawai KR, Koppikar CB and **Kulkarni MJ***. *OMICS: An Integrative Biology* 2013 (in press)
7. Proteomic study reveals downregulation of apolipoprotein A1 in plasma of poorly controlled diabetes: A pilot study. Bhonsle HS, Korwar AM, Chougale AD Kote SS, Dhande NL, Shelgikar KM, **Kulkarni MJ***. *Molecular Medicine Reports* 2013 (in press)
8. Analysis of AGE modified proteins and RAGE expression in HER2/neu negative invasive ductal carcinoma. Korwar AM, Bhonsle HS, Chougale AD, Kote SS, Gawai KR, Ghole VS, Koppikar CB, **Kulkarni MJ***. *Biochem Biophys Res Commun.* 2012 Feb 14. [Epub ahead of print]
9. Low plasma albumin levels are associated with increased plasma protein glycation and HbA1c in diabetes. Bhonsle HS, Korwar AM, Kote SS, Golegaonkar SB, Chougale AD, Shaik ML, Dhande NL, Giri AP, Shelgikar KM, Boppana R, **Kulkarni MJ***. *J Proteome Res.* 2012 Feb 3;11(2):1391-6
10. Dynamic proteome in enigmatic preeclampsia: An account of molecular mechanisms and biomarker discovery. Sheon MS1, Patil GV, Kulkarni VA, **Kulkarni MJ***, Joshi SR, Mehendale SS, Giri AP (2012) *Proteomics Clinical Applications* (in press) (Invited review)
11. Effects of arsenite stress on growth and proteome of *Klebsiella pneumonia*. Daware V, Suresh KK, **Kulkarni MJ**, Gade WN. *Journal of Biotechnology* (2012) (in press)
12. Purification and characterization of an antioxidant protein (16 kDa) from *Terminalia chebula* fruit. Pratibha Srivastava, Hema N. Raut, Renuka S. Wagh, Hemalata M. Puntambekar, **Kulkarni MJ**. *Food Chemistry* 131 (2012) 141–148
13. Comparative and chemical proteomic approaches reveal gatifloxacin deregulates enzymes involved in glucose metabolism. Suresh KK, Bhosale SD, Thulasiram HV, **Kulkarni MJ***. *J Toxicol Sci.* 2011;36(6):787-96.
14. Proteomic Analysis of Glycated Proteins from Streptozotocin-Induced Diabetic Rat Kidney. Chougale AD, Bhat SP, Bhujbal SV, Zambare MR, Puntambekar S, Somani RS, Boppana R, Giri AP, **Kulkarni MJ***. *Mol Biotechnol.* 2012 Jan;50(1):28-38.

15. Interaction of recombinant CanPIs with *Helicoverpa armigera* gut proteases reveals their processing patterns, stability and efficiency. Mishra M, Tamhane VA, Khandelwal N, **Kulkarni MJ**, Gupta VS, Giri AP. *Proteomics*. 2010 Aug;10(15):2845-57.
16. Discovery of rifampicin as a new anti-glycating compound by matrix-assisted laser desorption / ionization mass spectrometry-based insulin glycation assay. Golegaonkar SB, Bhonsle HS, Boppana R, **Kulkarni MJ***. *Eur J Mass Spectrom (Chichester, Eng)*. 2010;16(2):221-6.
17. LC-UV and LC-MS evaluation of stress degradation behaviour of tenatoprazole. Mahadik MV, **Kulkarni MJ**, Dhaneshwar SR. *Journal of Pharmaceutical and Biomedical Analysis* 2009; 50: 787–793.
18. Column liquid chromatography-ultraviolet and column liquid chromatography/mass spectrometry evaluation of stress degradation behavior of escitalopram oxalate. Dhaneshwar SR, Mahadik MV, Kulkarni MJ. *J AOAC Int*. 2009 Jan-Feb;92(1):138-47.
19. Albumin competitively inhibits glycation of less abundant proteins. Bhonsle HS, Singh SK, Srivastava G, Boppana R, **Kulkarni MJ***. *Protein Pept Lett*. 2008;15(7):663-7
20. Study of papain-cystatin interaction by intensity fading MALDI-TOF-MS. Shabab M, **Kulkarni MJ***, Khan MI. *Protein J*. 2008 Jan;27(1):7-12.
21. Characterization of the proteins of bacterial strain isolated from contaminated site involved in heavy metal resistance--a proteomic approach. Bar C, Patil R, Doshi J, **Kulkarni MJ***, Gade WN. *J Biotechnol*. 2007 Feb 20;128(3):444-51. Epub 2006 Nov 24.
22. An attempt at taxonomical characterization of some Rhizobial species by intact cell MALDI mass spectrometry. Prabhu RR, **Kulkarni MJ***, Parshurami V, Santhakumari V, Paranjape S *World J Microbiol Biotechnology*. 2007; 23:177-185.
23. Intact cell matrix-assisted laser desorption/ionization mass spectrometry as a tool to screen drugs in vivo for regulation of protein expression. **Kulkarni MJ***, Vinod VP, Umasankar PK, Patole MS, Rao M. *Rapid Commun Mass Spectrom*. 2006;20(18):2769-72.
24. Differential protein expression in human gliomas and molecular insights. Chumbalkar VC, Subhashini C, Dhople VM, Sundaram CS, Jagannadham MV, Kumar KN, Srinivas PN, Mythili R, Rao MK, **Kulkarni MJ**, Hegde S, Hegde AS, Samuel C, Santosh V, Singh L, Sirdeshmukh R. *Proteomics*. 2005 Mar;5(4):1167-77.
25. Cytokinin oxidase activity and cytokinin content in roots of sunflower under water stress. Manju RV, **Kulkarni MJ**, Prasad TG, Sudarshana L, Sashidhar VR. *Indian J Exp Biol*. 2001 Aug;39(8):786-92.
26. A novel colorimetric assay and activity staining for cytokinin oxidase based on the copper amine oxidase property of the enzyme. **Kulkarni MJ**, Theerthaprasad D, Sudharshana L, Prasad TG, Sashidhar VR. *Phytochem Anal*. 2001 May-Jun;12(3):180-4.

27. Genotypic variation in 'early warning signals' from roots in drying soil : Intrinsic differences in ABA synthesizing capacity rather than root density determines total ABA 'message' in cowpea (*Vigna unguiculata* L.) in top dry zone. **Kulkarni MJ**, Prasad TG and Sashidhar VR *Annals of Applied Biology* (UK). (2000); 136: 267-272.
28. Should Plants keep their canopy 'cool' or allow it to grow 'warm' under stress: It's a Hobsons choice and plants survive by doing a balancing act. Sashidhar, VR., Ankegowda SJ., **Kulkarni MJ**, Srinivas MN., Prasad TG. and Devendra, R, *Current Science*(2000). 78: 786-789.
29. Biochemical and histological changes associated with downy mildew infection in sunflower. Prashanth Kumar BR., **Kulkarni MJ**, Veena Rao BN., Chandrika K, Balakrishna G. *Helia*,2000; 23: 1-18.
30. Slower-chemical or faster electrical signalling under stress in plants: Is it the hare and tortoise story of slower signal winning the race? Rekha G., Sudarshana L., Prasad TG, **Kulkarni MJ** and Sashidhar VR., *Current Science*. (1996). 71 : 284-289.

Patents

1. Methods of producing and developing cold temperature tolerant plants, seed and crops (co-author at Monsanto Research center Bangalore). WO 2007/ 112122 A2