**CURRICULUM VITAE**
**GAUTAM SARATH**

## I. PERSONAL DATA

Present Assignment: Research Molecular Biologist, USDA –ARS, Grain, Forage and Bioenergy Research Unit, Lincoln, NE. 332 Keim Hall, East Campus, Lincoln, NE 68583-0939.
Phone: 402-472-4204. FAX: 402-472-4020. E-mail: Gautam.Sarath@ars.usda.gov
Adjunct Professor: Entomology, Agronomy and Horticulture, and Biochemistry Departments, University of Nebraska-Lincoln.

## II. EDUCATION

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|---|---|
| Ph.D. 1984 | University of California-Davis |
| M.Sc. 1976 | Botany. University of Delhi, Delhi, India |
| B.Sc (Honors) 1974 | Botany. University of Delhi, Delhi, India |

## III. ACADEMIC AWARDS AND HONORS

2004: Appointed as Adjunct Professor, University of Nebraska-Lincoln

1996: Promoted to Associate Professor and Fellow of the Graduate College, University of Nebraska-Lincoln.

1990: Promoted to Assistant Professor, University of Nebraska-Lincoln.

1987: Full travel and registration award to attend and present research at the Tenth Annual Symposium in Plant Physiology at the University of California-Riverside, January 8-10.

1983: DuPont Travel Award, Department of Agronomy and Range Science, University of California-Davis.

1976-1978: Doctoral Fellowship, Council of Scientific and Industrial Research, India.

1974-1976: Merit Fellowship, Indian Council of Agricultural Research.

## IV. POSITIONS HELD

2003-Present: Research Molecular Biologist, USDA-ARS
Grain, Forage and Bioenergy Research Unit, Lincoln, NE
& Adjunct Professor of Agronomy, Horticulture and Entomology
University of Nebraska-Lincoln, Lincoln, NE 68583

1996-2003: Associate Professor, Center for Biotechnology & Department of Biochemistry,

University of Nebraska-Lincoln, Lincoln, NE 68583-0718.

1989-1995: Assistant Professor, Center for Biotechnology & Department of Biochemistry
University of Nebraska-Lincoln, Lincoln, NE 68583-0718.

1984-1989: Research Associate, Department of Biochemistry
University of Nebraska-Lincoln, Lincoln, NE 68583-0718.

1980-1984: Research Assistant, Department of Agronomy and Range Science
University of California-Davis, Davis, CA 95616.

1979-1980: Post-Graduate Research Assistant, Department of Botany
University of California-Davis, Davis, CA 95616.

1976-1978: Research Fellow, Department of Botany, University of Delhi
Delhi, India.

1974-1976 : Junior Research Fellow, Department of Botany, University of Delhi
Delhi, India.

## V. ACADEMIC/SUPERVISORY RESPONSIBILITIES

Served on several hiring committees as a member or chair.

- Graduated 6 PhD students, 4 MS student and several undergraduate students (Honors Theses).
- Co-advised 6 PhD students and 5 MS students
- Serve on 6 MS and 6 PhD supervisory committees.

## VI. GRANTS

CURRENT GRANTS

2014-2019: "Exploiting natural diversity to identify alleles and mechanisms of cold adaption in switchgrass". USDA-DOE Feedstock Genomics Program, Co-PI. NIFA Award Number: 2014-67009-22310. GS-$109,999

2016-2020: "Genetics and Genomics of Pathogen Resistance in Switchgrass". USDA-DOE Feedstock Genomics Program, Co-PI. DOE Award Number: DE-SC0016108. $1,019,326

PENDING GRANTS

2020-2025: “Systems Level Understanding of Switchgrass Cold Hardiness and Microbiome for Sustainable Biomass Yields”. DOE-BER. Co-PI.

PREVIOUS GRANTS AWARDED

1990-1991: "Soybean root nodule proteins", University of Nebraska-Lincoln Research Council.

1991-1992: "Design and synthesis of peptidase substrates", University of Nebraska-Lincoln Research Council.

1992-1993: "Molecular cloning and site-directed mutagenesis of a leghemoglobin gene, Lba, from soybean root nodules@, Center for Biotechnology, University of Nebraska-Lincoln. 1 of 4 PIs.

1992-1993: "Protein phosphatase substrates", Center for Biotechnology, University of Nebraska-Lincoln. 1 of 2 PIs.

1992-1994: "The role of acetylcholine in plant signal transduction pathways: An interdisciplinary investigation", Center for Biotechnology, University of Nebraska-Lincoln. 1 of 3 PIs.

1995-1996: Development of wheat gluten binders for textile print pastes, IANR-ARD-Dean=s Office. 1 of 2 PIs.

1993-1996: Chloroplast Protein Phosphatase, NSF. 1 of 2 PIs.

1995-1996: Acquisition of the PerSeptive Instruments BioCAD Workstation, USDA-NRICGP. 1of 2 PIs.

1995-1998: Enzymes influencing leghemoglobin in legumes, USDA-NRICGP. 1 of 2 PIs.

1998-2000. Soy protein allergens, Pioneer Hibred International. 1 of 3 PIs.

1999-2004. NSF-EPSCOR, Bioinformatics, 1 of several PIs

1999-2003. NIH-BRIN, Functional Genomics, 1 of several PIs.

2003: NIH-COBRE, Establish Redox Biology Center (Collaborator)

2004-2007: NIH: Vitamin-dependent modification of histones. Co-PI

Mentor: NIH-BRIN: Nebraska Research Network in Functional Genomics. July 1, 2004 through June 30 2009.

2011-2012 "Micro/nanomechanical studies of switchgrass composition and cellulose breakdown kinetics" funded through the UNL-Energy Sciences Research, Co-PI.

2009-2013: "The hunt for green every April: Factors affecting fitness in switchgrass". DOE-USDA Feedstocks Genomics Program. US Department of Energy Grant Number DE-AI02-09ER64829PI.

2011-2016: "Mitigating insect herbivory of warm-season bioenergy grasses - getting ahead of the curve". USDA-NIFA Competitive Grants Program, PI. NIFA Award Number: 2011-67009-30096. $997,741

## VII. RESEARCH INTERESTS

My research interests lie in the general domain of plant biology and biofuels. I have focused on understanding the molecular, physiological and biochemical aspects of plant development, cell function, senescence and response to environmental stress. Additionally, I have collaborations with other scientists encompassing a variety of disciplines.

## VIII. TEACHING INTERESTS

Plant biochemistry & physiology; Nitrogen fixation; General botany; Plant development; Biomass crops genomics and utilization.

## IX. RESEARCH EXPERTISE

Extensive experience in biochemistry, molecular biology, analytical methodology and plant developmental physiology including, protein purification, enzymology, mutagenesis, cloning, and expression of recombinant proteins and peptides. Biology of energy crops and their utilization. Enjoy collaborative work.

## X. TEACHING EXPERIENCE

I have taught an Introductory Biochemistry course for non-majors.

I have developed and taught a course entitled: Research Techniques in Biochemistry. This was a joint upper level undergraduate/beginning graduate student laboratory/lecture course. The course focused on developing skills associated with analyzing and characterizing proteins. It exposed students to several aspects of protein analyses, such as spectrophotometry, enzyme kinetics, gel electrophoresis, immunoblotting techniques and protein purification.

I have taught courses in Plant Physiology and Plant development as a Teaching Assistant during my Ph. D. Program. I have guest –lectured in several classes since 2003.

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## XI. PUBLICATIONS

Chapters in Books

G. Sarath, and F.W. Wagner. (1989) Immunodetection of Nitrogenase, In: Modern Method of Plant Analysis. Springer-Verlag, Heidelberg. 9, 227-239.

G. Sarath, R.S. de la Motte, and F.W. Wagner. (1989) Assay of Proteases, In: Proteolytic Enzymes-A Practical Approach. IRL Press, London. pp 25-55.

G. Sarath, M.G. Zeece, and A.R. Penheiter. (2001) Assay of Proteases, In: Proteolytic Enzymes-A Practical Approach. IRL Press, London.

G. Sarath, and S.D. Schwartzbach. (2001) Use of GFP as a reporter for the analysis of sequence-specific proteases (Unit 21.14). Current Protocols in Protein Science.

G. Camporeale, N. Kothapalli, G. Sarath, and J. Zempleni (2005) Roles for biotinylation of histones in chromatin structure, In: Nutrients and Cell Signaling, J. Zempleni and K. Dakshinamurti (eds.). Taylor and Francis Group. Boca Raton, FL. pp: 277-296.

M. Zeece, J. Markwell, G. Sarath and X. Gu (2006) Proteomic assessment of allergens in foods, In: Detecting allergens in foods, S.F. Koppelman and S.L. Hefle (eds.). CRC Press. Boca Raton, FL. pp: 144-157.

K.P. Vogel, G. Sarath, A.J. Saathoff, and R.B. Mitchell (2011) Switchgrass. p. 341-380. In: N.G. Halford and A.Karp (Eds.) Energy Crops. The Royal Society of Chemistry, Cambridge, UK.

L.E. Bartley, Y.Wu, A.J, Saathoff and G. Sarath (2013) Switchgrass genetics and breeding challenges. In: Bioenergy Feedtsocks. Breeding and Genetics. M.C. Saha, H. Bhandari, and J. Bouton (Eds.). Wiley and Sons. New York

Symposium Proceedings

F.W. Wagner, G. Sarath (1987) Biochemical changes in stressed and senescent soybean root nodules. In. Plant Senescence: Its Biochemistry and Physiology. The American Society of Plant Physiologists. pp 190-197.

Journal Articles

1. L.M. Baird, G.Sarath, B.D. Webster (1983) Effects of prevention of flowering on the growth of bean plants inoculated with an ineffective strain of Rhizobium phaseoli. Bot. Gaz. 144: 225-230.

2. G. Sarath, H.C. Cohen, F.W. Wagner (1986) High-performance liquid chromatographic

separation of leghemoglobins form soybean root nodules. Anal. Biochem. 154: 224-231.

3. G. Sarath, N.E. Pfeiffer, C.S. Sodhi, F.W. Wagner (1986) Bacteroids are stable during dark-induced senescence of soybean root nodules. Plant Physiol. 82: 346-350.

4. H.C. Cohen, G. Sarath, K. Lee, F.W. Wagner (1986) Soybean root nodule ultrastructure during dark-induced stress and recovery. Protoplasma. 132: 69-75.

5. J.M. Couton, G. Sarath and F.W. Wagner. (1991) Purification of an aminopeptidase from soybean cotyledons. Plant Sci. 75: 9-17.

6. C. Lin, G. Sarath, J.A. Frank and R.J. Krueger. (1991) Bivalent ACTH antagonists: Influence of peptide and spacer component on potency enhancement. Biochem Pharmacol. 41: 789-795.

7. Y-H. Wang, S.M.G. Duff, L. Lepiniec, C. Cretin, G.Sarath, S.A. Condon, J.Vidal, P. Gadal, and R.Chollet. (1992) Site-directed mutagenesis of the phosphorylatable serine (ser8) in C4 phosphoenolpyruvate carboxylase from sorghum. J. Biol. Chem. 267: 16759-16762.

8. S.M.G. Duff, L. Lepiniec, C. Crétin, C.S. Andreo, S.A. Condon, G. Sarath, J. Vidal, P. Gadal, and R. Chollet (1993). An engineered change in the L-malate sensitivity of a site-directed mutant of sorghum phosphoenolpyruvate carboxylase: The effect of sequential mutagenesis and S-carboxylmethylation at position 8. Arch. Biochem. Biophys. 306: 272-276.

9. D.A. Dalton, L.M. Baird, L. Langeberg, C. Taugher, W.R. Anyan, C.P. Vance and G. Sarath. (1993) Subcellular localization of oxygen defense enzymes in soybean (Glycine max [L]. Merr) root nodules. Plant Physiology. 102: 481-487.

10. Sun G., G. Sarath and J.P. Markwell. (1993) Phosphopeptides as substrates for thylakoid protein phosphatase activity. Arch. Biochem. Biophys. 304: 490-495.

11. H-K. Jun, G. Sarath, J.F. Moran, M. Becana, R.V. Klucas and F.W. Wagner (1994) Characteristics of modified leghemoglobins isolated from soybean root nodules. Plant Physiol. 104: 1231-1236.

12. S.M.G. Duff, G. Sarath and W.C. Plaxton (1994) The role of acid phosphatases in plant phosphorous metabolism. Physiol Plant. 90: 791-800.

13. L. Ji, M. Becana, G. Sarath and R.V. Klucas (1994) Cloning and sequence analysis of a cDNA encoding ferric leghemoglobin reductase from soybean nodules. Plant Physiol. 104: 453-459.

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14. H-K. Jun, G. Sarath and F.W. Wagner (1994) Detection and purification of modified leghemoglobins from soybean root nodules. Plant Sci. 100: 31-40.

15. L. Ji, M. Becana, G. Sarath, L. Shearman and R.V. Klucas (1994) Over-expression in Escherichia coli and characterization of a soybean ferric leghemoglobin reductase. Plant Physiol. 106: 203-209.

16. C.M. Smith, G. Sarath, and R. Chollet (1994) A simple, single-tube radioisotopic assay for the phosphorylating/inactivating activity of the pyruvate,orthophosphate dikinase regulatory protein. Photosynth. Res. 40: 295-301.

17. V.K. Pedibhotla, J.R. Sauer, G. Sarath and D.W. Stanley-Samuelson (1994). Prostaglandin biosynthesis and subcellular localization of PGH synthase activity in lone star tick, Amblyomma americanum. Insect Biochem. Mol. Biol. 25: 1027-1039.

18. S. Madhavan, G. Sarath, and P.L. Herman. (1995). Acetylcholine esterase activity in plants. The Proceedings of the Fifth International Cholineesterase Conference. Plenum Publishing Corp. New York. pp: 291-292.

19. J.M. Uscian, J.S. Miller, G.Sarath and D.W. Stanley-Samuelson. (1995). A digestive phospholipase A2 in the tiger beetle Cicindella circumpicta. J. Insect Physiol. 41: 135-141.

20. S.M.G. Duff, C.S. Andreo, V.Pacquit, L. Lepiniec, G.Sarath, S.A. Condon, J. Vidal, P. Gadal, and R. Chollet. (1995). Kinetic analysis of the non-phosphorylated, in-vitro phosphorylated and phosphorylation-site mutant (Asp-8) forms of intact recombinant C4 phosphoenolpyruvate carboxylase from sorghum. Eur. J. Biochem. 228: 92-95.

21. M.F. Hammer, G. Sarath, J.C. Osterman, and J. Markwell. (1995). Assessing modulation of stromal and thylakoid light-harvesting complex-II phosphatase activities with phosphopeptide substrates. Photsynth. Res. 44: 107-115.

22. R. Arredondo-Peter, A. Bonic, G. Sarath, and R.V. Klucas. (1995). Rapid PCR-based detection of inserts from cDNA libraries using phage pools or direct phage plaques and lambda primers. Plant. Mol. Biol. Rep. 13: 138-146.

23. S. Madhavan, G. Sarath, B.H. Lee, R.S. Pegden. (1995). Guard cell protoplasts contain acetylcholinesterase activity. Plant Sci. 109: 119-127.

24. N.R. Hegde, S.A. Ellis, R.M. Gaddum, C.A. Tregaskes, G. Sarath, S. Srikumaran. (1995). Peptide motif of bovine MHC class I antigen, BoLA-A11. Immunogenetics. 42: 302-303.

25. M.F. Hammer, G.Sarath, J. Markwell. (1995). Dephosphorylation of the thylakoid

membrane light-harvesting complex-II by a stromal protein phosphatase. Photosynth Res. 45: 195-201.

26. M.F. Hammer, J. Markwell, G. Sarath. (1997) Purification of a protein phosphatase from chloroplast stroma capable of dephosphorylating the light-harvesting complex-II. Plant Physiol. 113: 227-233.

27. M.S. Hargrove, J.K. Barry, E.A. Brucker, M.B. Berry, G.N. Phillips Jr., J.S. Olson, R. Arredondo-Peter, J.M. Dean, R.V. Klucas, G.Sarath. (1997). Characterization of recombinant soybean leghemoglobin a and apolar distal histidine mutants. J. Mol Biol. 267: 1032-1042.

28. R. Arredondo-Peter, J.F. Moran, G. Sarath, P. Luan, and R. Klucas. (1997). Molecular cloning of the cowpea (Vigna unguiculata) leghemoglobin II gene and expression of its cDNA in Escherichia coli; Purification and characterization of the recombinant protein. Plant Physiol. 114: 493-500

29. B. Li, V. Pacquit, J-A. Jiao, S.M.G. Duff, G.B. Maralihari, G. Sarath, S.A. Condon, J. Vidal, R. Chollet. (1997). Structural requirements for phosphorylation of C4-leaf phosphoenolpyruvate carboxylase by its highly regulated protein serine kinase. A comparative study with synthetic peptide substrates and native, mutant target proteins. Aust. J. Plant Physiol. 24: 443-449.

30. A.R. Penheiter, S.M.G. Duff, G. Sarath (1997). Soybean root nodule acid phosphatase. Plant Physiol. 114: 597-604.

31. R. Arredondo-Peter, M.S. Hargrove, G. Sarath, J. Lohrman, J.F. Moran, J. Olson and R. Klucas. (1997). Rice hemoglobins. Plant Physiol. 115: 1259-1266

32. R.L. Rana, G. Sarath and D.W. Stanley. (1998). A digestive phospholipase A2 in midguts of tobacco hornworms. J. Insect. Physiol. 44: 297-303

33. R. Arredondo-Peter, J.F. Moran, G. Sarath and R. Klucas (1997). Analysis of cowpea (Vigna unguiculata) leghemoglobin genes. Brazilian Journal of Plant Physiology. 9: 143-149.

34. R. Arredondo-Peter, M.S. Hargrove, J.F. Moran, G. Sarath and R. V. Klucas. (1998). Plant hemoglobins. Plant Physiol. 118: 1121-1125

35. A.R. Penheiter, R.V. Klucas and G. Sarath. (1998). Purification and characterization of a soybean root nodule phosphatase expressed in Pichia pastoris. Protein. Expr. Purif. 14: 125-130

36. M.G. Zeece, T.A. Beardslee, J.P. Markwell and G. Sarath. (1998). Identification of IgE-binding region in soybean acidic glycinin G1. J. Food. Agric. Immunol. 11: 83-90.

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37. J. C. Pehrson, A.Weatherman, J. Markwell, G. Sarath and S. D. Schwartzbach. (1999). The use of GFP as a reporter for the facile analysis of sequence specific proteases. Biotechniques. 27: 28-32.

38. X-Q. Zhang, A. L. Lund, G. Sarath, R. L. Cerny, D. M. Roberts and R. Chollet. (1999). Soybean nodule sucrose synthase (Nodulin 100): Further analysis of its phosphorylation using recombinant and authentic root nodule enzymes. Arch. Biochem. Biophys. 371:70-82.

39. C.J. Chastain, M. Botschner, G.E. Harrington, B.J. Thompson, S.E.Mills, G. Sarath, and R. Chollet. (1999). Further analysis of maize C-4-pyruvate, orthophosphate dikinase regulatory phosphorylation by its bifunctional regulatory protein using selective substitution of the regulatory Thr/456 and catalytic His/458 residues. Arch. Biochem. Biophys. 375: 165-170.

40. L. Peng, E. Arechaga-Ocampo, G. Sarath, R. Arredondo-Peter R, and R. Klucas. (2000). Analysis of a ferric leghemoglobin reductase from cowpea (Vigna unguiculata) root nodules. Plant Sci. 154: 161-170.

41. R. M. Barata, A. Chapparo, S.M. Chabregas, R. González, C.A. Laabate, A. Azevedo, G. Sarath, P.J. Lea, and M.C. Silva-Filho. (2000). Targeting of the soybean leghemoglobin to tobacco chloroplasts: effects on aerobic metabolism in transgenic plants. Plant Sci. 155: 193-202.

42. R. Arredondo-Peter, M. Ramírez, G. Sarath, and R.V. Klucas. (2000). Sequence analysis of an ancient hemoglobin cDNA isolated from the moss Physcomitrella patens (Accession No. AF218049). Plant Physiol. Plant Gene Register.

43. K. Lira-Ruan, G. Sarath, R.V. Klucas, and R. Arredondo-Peter. (2000). Characterization of leghemoglobin from a mimosoid legume, Leucaena esculenta, root nodules. Brazilian Journal of Plant Physiology. 12: 37-44.

44. D. A. McMillen, W.M. Old, J.L. Bleibaum, C. M. Nicolet, K.R. Resing, G. Sarath, and S.P. Yadav. (2000). Job compensation in the biotechnology core laboratory. Nature Biotechnol. 18: 686-689.

45. M. S. Hargrove, E. A. Brucker, B. Stec, G. Sarath, R. Arredondo-Peter, R. Klucas, , J.S. Olson, and G.N. Phillips, Jr. (1999). Crystal Structure of a Non-symbiotic Plant Hemoglobin. Structure Des Fold. 8:1005B1014.

46. B.-T. Oh, G. Sarath, P.J. Shea, R.A. Drijber, and S.D. Comfort (2000). Rapid spectrophotometric determination of 2,4,6-trinitrotoluene and application in enzyme studies. J. Microbiol. Meth. 2: 149-158

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47. B.-T. Oh, G. Sarath, and P.J. Shea. (2001). TNT nitroreductase from a Pseudomonas aeruginosa strain isolated from TNT-contaminated soil. Soil. Biol. Biochem. 33: 875-881

48. T.A. Beardslee, M.G. Zeece, G. Sarath, and J.P. Markwell. (2000). Soybean Glycinin G1 Acidic Chain Shares IgE Epitopes with Peanut Allergen Ara h 3. 123: 299-307.

49. Z. Zhang, G.Y. Yuen, G. Sarath, and A.R. Penheiter. (2001). Chitinases from the plant disease biocontrol agent, Stenotrophomonas maltophila C3. Phytopathology. 91: 204-211.

50. X. Ni, S.S. Quisenberry, T. Heng-Moss, J. Markwell, G. Sarath, R. Klucas and F. Baxendale (2001) Oxidative Responses of Resistant and Susceptible Cereal Leaves to Symptomatic and Non-Symptomatic Cereal Aphid (Hemiptera: Aphididae) Feeding. J. Econ. Entomol 94:743-751.

51. Gu, X, T. Beardslee, M. Zeece, G. Sarath, and J. Markwell (2001). Identification of IgE-binding proteins in soy lecithins. Int. Arch. Allergy Immunol. 126: 218-225.

52. Lira-Ruan V, Sarath G, Klucas RV, and Arredondo-Peter R (2001) Synthesis of hemoglobins in rice (Oryza sativa var. Jackson) plants growing in normal and stress conditions. Plant Sci. 161: 279-287.

53. Ross EJH, Shearman L, Mathiesen M, Zhou YJ, Arredondo-Peter R, Sarath G, and Klucas RV (2001) Non-symbiotic hemoglobins in rice are synthesized during germination and in differentiating cell types. Protoplasma. 218: 125-133.

54. Aréchaga-Ocampo E, J. Saenz-Rivera, G. Sarath, R.V. Klucas, and R. Arredondo-Peter. (2001). Cloning and expression analysis of hemoglobin genes from maize (Zea mays ssp. mays) and teosinte (Zea mays ssp. parviglumis). Biochim. Biophys. Acta. 1522: 1-8.

55. Lira-Ruan V, Ross, EJH, Sarath G, Klucas RV, Hargrove MS, Arredondo-Peter R (2002) Mapping and analysis of a hemoglobin gene family from rice (Oryza sativa). Plant Physiol Biochem. 40: 199-202.

56. Moran JF, Sun Z, Sarath G, Arredondo-Peter R, Becana M, Klucas R. (2002). Molecular cloning, sequencing and over-expression in Escherichia coli of a novel ferric leghemoglobin reductase isozyme from soybean (Glycine max) root nodules. Plant Physiol. 123: 300-313.

57. Zhang H, Jacobi SK, Toombs CF, Cianflone KH, Nersesian N, Sarath G, Miner JL (2002) Purification and Characterization of Acylation Stimulating Protein from Porcine Serum. Protein Expr Purific. 348-352.

58. Ross EJH, Lira-Ruan, Arredondo-Peter R, Klucas RV, Sarath G (2002) Recent Insights Into Plant Hemoglobins. Rev Plant Biochem Biotechnol. 1: 173-189.

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59. Komina O, Zhou Y, Sarath G, Chollet R (2002) In vivo and in viro phosphorylation of membrane and soluble forms of soybean nodule sucrose synthase. Plant Physiol. 129: 1664-1773.

60. Feng Z, Caceres NE, Sarath G, Barletta R (2002) Mycobacterium smegmatis L-alanine dehydrogenase (Ald) is required for proficient utilization of alanine as a sole nitrogen source and sustained anaerobic growth. J Bacteriol. 184: 5001-5010.

61. Xiang P, Beardslee T, Zeece M, Markwell J, Sarath G (2002) Identification and analysis of a conserved IgE-binding epitope in soybean G1a, G2a and peanut AraH3 glycinins. Arch Biochem Biophys. 408: 51-57.

62. Chastain CJ, Fries JP, Vogel JA, Randklev CL, Vossen AP, Dittmer SK, Watkins EE, Fiedler LJ, Wacker SA, Meinhover KC, Sarath G, Chollet R. (2002) Pyruvate, Orthophosphate dikinase in leaves and chloroplasts of c(3) plants undergoes light /dark-induced reversible phosphorylation. Plant Physiol. 128: 1368-1378.

63. Roychaudhuri R, Sarath G, Zeece M, Markwell J (2003) Reversible denaturation of the soybean Kunitz trypsin inhibitor. Arch Biochem Biophys. 412: 20-26.

64. Oh B-T, Shea PJ, Drijber RA, Vasilyeva GK, Sarath G (2003) TNT Biotransformation and Detoxification by *a Pseudomonas aeruginosa* Strain. Biodeg. 14: 309-319.

65. Hansen KK, Kittok RJ, Sarath G, Toombs CF, Caceres N, Beck MM (2003) Estrogen receptor-α populations change with age in commercial laying hens. Poultry Sci. 82: 1624-1629.

66. Moran JF, James EK, Rubio MC, Sarath G, Klucas RV, Becana M (2003) Functional characterization, expression, and subcellular localization of a novel iron-superoxide dismutase from cowpea *(Vigna unguiculata)* root nodules. Plant Physiol. 133: 773-782.

67. Lira-Ruan V, Sarath G, Klucas RV, Arredondo-Peter R (2003) In silico analysis of a flavohemoglobin from Sinorhizobium meliloti strain 1021. Microbiol Res. 158: 215-227.

68. Zhou X, Scharf ME, Sarath G, Meinke LJ, Chandler LD, Siegfried BD (2003) Partial purification and characterization of a general esterase associated with methyl-parathion resistance in Diabrotica virgifera virgifera (Cleoptera:Chrysomelidae). Pesticide Biochem Physiol. 78: 144-125.

69. Dassanayake RP, Caceres NE, Sarath G, Duhamel GE (2004) Biochemical properties of membrane-associated proteases of *Brachyspira pilosicoli* isolated from humans with intestinal disorders. J Med Microbiol. 53: 319-323

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70. Heng-Moss T, Sarath G, Baxendale F, Novak D, Bose S, Ni X, Quisenberry S (2004) Characterization of protein changes in buffalograsses challenged by *Blissus occiduus*. J Econ Entomol. 97: 1086-1095

71. Roychaudhuri R, Sarath G, Zeece M, Markwell J (2004) Stability of the allergenic soybean Kunitz trypsin inhibitor. Biochim Biophys Acta. 699: 207-212

72. Ross EJH, Elowsky C, Stone J, Arredondo-Peter R, Klucas RV, Sarath G (2004) Rice nonsymbiotic hemoglobin-2 promoter is activated by the cytokinin-regulated transcription factor, ARR1. J Exp Bot. 55: 1721-1731.

73. Xiang P, Haas E, Zeece M, Markwell J, Sarath G (2004) C-terminal 23 kD polypeptide of soybean Gly m Bd 28K is a potential allergen. Planta. 220: 56-63

74. Camporeale G, Schubert EE, Sarath G, Cerny R, Zempleni J (2004) Lysine-8 and lysine-12 are biotinylated in human histone H4. Eur J Biochem. 271: 2257-2263

75. Kundu S, Blouin GC, Premer SA, Sarath G, Olson JS, Hargrove MS (2004) TyrB10 Prevents Stabilization of Bound Oxygen in Soybean Leghemoglobin. Biochemistry. 43: 6241-6252

76. Sáenz-Rivera J, Sarath G, Arredondo-Peter R (2004) Modeling the tertiary structure of a maize (Zea mays ssp. mays) non-symbiotic hemoglobin. Plant Physiol Biochem. 42: 891-897

77. Leelaporn O, Sarath G, Staswick P (2004) A single amino acid substitution in soybean VSP-alpha increases its acid phosphatase activity nearly 20-fold. Planta. 219: 1071-1079

78. Oommen AM, Griffin JB, Sarath G, Zempleni J (2005) Roles for nutrients in epigenetic events can be characterized by using a combination of chromatin immunoprecipitation assays and DNA microarrays. J Nutr Biochem. 16: 74-77

79. Dassanayake R, Sarath G, Duhamel GE (2005) Penicillin-binding proteins in the pathogenic intestinal spirochete *Brachyspira pilosicoli*. Antimicrob Agents Chemother. 4:1561-1563

80. Rodriguez-Melendez R, Griffin JB, Sarath G, Zempleni J (2005) High-throughput Immunoblotting Identifies Biotin-dependent Signaling Proteins in HepG2 Hepatocarcinoma Cells. J Nutr 135: 1659-1666.

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cv. *Gautam Sarath*

aphid (*Melanaphis sacchari*). Frontiers in Plant Science10: 145. doi: 10.3389/fpls.2019.00145. Log No. 357615.

199. Gupta AK, Scully ED, Palmer NA, Geib SM, Sarath G, Hein GL Satyanarayana T (2018) Wheat streak mosaic virus alters transcriptome of its vector, wheat curl mite (*Aceria tosichella* Keifer), to enhance mite development and population expansion. Journal of General Virology 100: 889-910. doi: 10.1099/jgv.0.001256. Log No. 357,669. FY19.

200. Graybosch RG, Bai G, St. Amand P, Sarath G (2019) On the persistence of rye (*Secale cereale* L.) chromosome arm 1RS in wheat (*Triticum aestivum* L.) breeding programs of the Great Plains of North America. Genetic Resources and Crop Improvement 66: 941-950. Doi: 10.1007/s10722-019-00742-4. Log No. 359002. FY19.

201. Palmer NA, Basu S, Heng-Moss T, Bradshaw JD, Sarath G, Louis J (2019) Fall army worm (*Spodoptera frugiperda* Smith) feeding elicits differential defense responses in upland and lowland switchgrass. PLoS One 14: e0218532. doi: 10.1371/journal.pone.0218352. Log No 362931. FY19.

202. Palmer NA, Reddy C, Muhle A, Yuen G, Edmé SJ, Tatineni S, Mitchell RB Sarath G (2019) Transcriptome divergence during leaf development in two contrasting switchgrass (*Panicum virgatum* L.) cultivars. PLoS One 4: e0222080. doi: 10.1371/journal.pone.0222080. Log No 363224. FY19.

203. Tetreault HM, Gries TL, Palmer NA, Funnell-Harris DL, Sarath G, Sato, S, Clemente TE, Sattler SE (2020) Overexpression of ferulate 5-hydroxylase increases syringyl units in *Sorghum bicolor*. Plant Molecular Biology 103: 269-285. doi: 10.1007/s11103-020-00991-3.

203. Chanbusarakum L, Cheng P, Aucar S, Sarath G, Palmer NA, Edmé SG, Tobias CM (2020) Responsiveness of related tetraploid and neo-octoploid switchgrass family lines to water deficit stress and recovery. BioEnergy Research 13: 63–78. doi.org/10.1007/s12155-020-10092-0. Log No. 365375. FY19.

204. Souza D, Jiménez AV, Sarath G, Meinke LJ, Miller NJ, Siegfried BD (2020) Enhanced metabolism and selection of pyrethroid-resistant western corn rootworms (*Diabrotica virgifera virgifera* LeConte). Pesticide Biochemistry & Physiology 164:165-172. doi: 10.1016/j.pestbp.2020.01.009. Log No. FY19.

205. Becana M, Yruela I, Sarath G, Catalán P, Hargrove MS (2020) Plant hemoglobins, a journey from unicellular green algae to angiosperms. Invited Tansley Review. New Phytologist 2020 Jan 21. Doi: 10.1111/nph.16444. Log No. 369862. FY20.

206. Koch KG, Palmer NA, Donze-Reiner T, Scully ED, Seravalli J, Amundsen K, Twigg P,

cv. *Gautam Sarath*

Louis J, Bradshaw JD, Heng-Moss T, Sarath G (2020) Aphid-responsive defense networks in hybrid switchgrass. Submitted April 17, 2020 to Frontiers in Plant Science (in-review). Log No. 370762. FY20.

207. Zogli PK, Alavrez S, Naldrett M, Palmer NA, Pingault L, Koch KG, Heng-Moss T, Bradshaw JB, Louis J, Sarath G (2020) Greenbug (*Schizaphis graminum*) herbivory significantly alters switchgrass (*Panicum virgatum*) proteome. Scientific Reports (in-review). Log. No. 373110. FY20.

208. Pingault L, Palmer NA, Koch KG, Zogli PK, Heng-Moss T, Bradshaw JB, Seravalli J, Twigg P, Louis J, Sarath G (2020) Differential defense responses of upland and lowland switchgrass cultivars to a cereal aphid pest. (in-preparation). FY20

PUBLISHED ABSTRACTS: ~230 Until June 2019

**XII**. INVITED PRESENTATIONS: (since 2005)

"Switchgrass seed dormancy". 5th Annual Native Seed Quality Workshop, 25 February, 2005, Omaha, NE.

"Application of functional genomic tools for exploring switchgrass feedstocks improved through divergent selection". 27th Symposium on Biotechnology for Fuels and Chemicals, April 29-May 1, 2005, Denver, CO.

"Modification of herbaceous biomass composition to enhance ethanol yields in a biorefinery". Agricultural Biotechnology: Today and Tomorrow, Gordon Research Conference. March 11-March 16, (2007), Ventura, CA.

"Fuels from herbaceous feedstocks: A switchgrass-centric perspective". National American Chemical Society Meetings. March 22-March 28, (2007). Chicago, IL.

"Cell wall composition and accessibility to hydrolytic enzymes is differentially altered in divergently bred switchgrass (Panicum virgatum L.) genotypes," 29th Symposium on Biotechnology for Fuels and Chemicals, April 29-May 1, 2007, Denver, CO.

"Switchgrass and sorghum for biofuels". Invited seminar at Coe College, Cedar Rapids, IA, March 8, 2008.

"Switchgrass for biofuels: Insights through microscopy. Annual Meetings of the Microscopy Society of America, August 3-7, 2008, Albuquerque, NM

"Switchgrass, lignin, enzymes and ethanol". 30th Symposium on Biotechnology for Fuels and Chemicals, May 2 – May 5, 2008, New Orleans, LA.

"Sustainable herbaceous biofuel production: Implications and impact". Second UNU-GIST symposium. October 19-21 2008, Gwangju, Korea.

"Genetic modification of switchgrass for increased ethanol production". Annual Meeting of the Korean Society of Applied Biochemistry. October 22, 2008. Daegu, Korea.

"Switchgrass for biofuels – if this aint chemistry what is?" Invited seminar, Creighton University, Omaha, NE. September 17, 2009

"Switchgrass a cool warm-season grass". Invited seminar. Department of Agronomy, University of Nebraska-Lincoln, NE. February 12, 2010

"Discovering traits controlling winter-hardiness and spring regrowth in diverse switchgrass germplasm". 32nd Symposium on Biotechnology for Fuels and Chemicals, April 19-22, 2010, Clearwater Beach, FL.

"The Hunt for Green Every April: phenotypic and metabolomic analysis of nutrient remobilization in Switchgrass". XIX Plant and Animal Genome Conference, January 15-19 2011, San Diego, CA.

"Switchgrass for Biofuels". National Center for Biological Research, Bengaluru, India, February 17, 2011.

"Switchgrass and Biofuels". Indian Institute of Technology, Gandhinagar, India, March 1, 2011.

"Switchgrass for biology – so cool for a hot field". Graduate Seminar, University of Nebraska at Omaha, March 9, 2011.

"Using basic tools to understand switchgrass development". Seminar at South Dakota State University. October 14, 2011.

"Sustainable Perennial Feedstocks for Second and Third Generation Conversion Platforms". Talk within the Fuels Panel, at the Heartlands Transatlantic Conference on Food and Fuels, October 16-18, 2011, Lincoln, NE

"ARS Biomass Research Centers, establishment, goals, future needs and partnerships. Talk at the Biofuels symposium at the Annual Meetings of the Entomological Society of America, November 13, 2011 – cancelled due to family illness.

"Switchgrass Molecular Biology 101". Seminar for Center for Grassland Studies, University of Nebraska at Lincoln, November 28, 2011.

"Building improved crown and rhizome transcriptomes to evaluate seasonal changes in switchgrass populations with divergent winter survival". Talk at the Annual DOE Feedstocks Genomics Meeting, San Diego, January 14, 2012

"Crown and rhizome transcriptomes from upland and lowland tetraploid switchgrasses". Talk at the 34th Symposium on Biotechnology for Fuels and Chemicals, April 30-May 3, 2012, New Orleans, LA.

"Switchgrass, cell walls and pyrolysis" at the 35th Symposium on Biotechnology for Fuels and Chemicals, Portland, OR, 2013.

"Genetic resources for the improvement of switchgrass (*Panicum virgatum* L.) for biomass and forage" at the XXIII International Grass Congress, New Delhi, India, 2015.

"Switchgrass metabolism", Department of Agronomy and Horticulture, University of Nebraska, Lincoln, NE, 2017.

"Molecular genetics of host plant resistance in switchgrass", Department of Entomology, Kansas State University, Manhattan, KS, 2018.