

Curriculum Vitae

KALIDAS SHETTY



Current Position

Professor of **Food Biotechnology**
Department of Food Science
University of Massachusetts
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Education

1989 - **Ph.D.** - **Microbiology**, University of Idaho, Moscow, ID, **USA**.
1985 - **M.S.** - **Bacteriology**, University of Idaho, Moscow, ID, **USA**.
1983 - **B.S.** - **Agricultural Science**, University of Agricultural Sciences,
Bangalore, **INDIA**.
(Major: **Microbiology**; Minor: **Plant Physiology**)

Professional Experience

2004-Current Professor, Department of **Food Science**, University of
Massachusetts, Amherst, MA, **USA**
1999-2004 Associate Professor (tenured), Dept. of **Food Science**,
University of Massachusetts, Amherst, MA, **USA**
1993-1999 Assistant Professor, Dept. of **Food Science**, University of
Massachusetts, Amherst, MA, **USA**.
1992-1993 Post-doctoral Scientist, **Plant Biology**, Univ. of Guelph,
CANADA.
1990-1991 Post-doctoral Scientist, **Plant Cell and Molecular Biology**,
National Inst. of Agrobiological Sciences, Tsukuba Science
City, **JAPAN**.
1989 Research Scientist, **Biochemical Engineering**, University of
Idaho, Moscow, ID, **USA**.
1986-1988 Research Assistant, **Plant Cell Physiology/Microbial
Physiology**, Univ. of Idaho, Moscow, ID, **USA**.
1984-1985 Research Assistant, **Microbial Physiology**, Univ. of Idaho,
Moscow, ID, **USA**.

Affiliate Faculty

- 1) Breast Cancer Research Cluster, Bay State Health System, Springfield, MA
- 2) Molecular and Cellular Biology, UMASS
- 3) Plant Biology, UMASS

Teaching Interests:

Food Biology & Biochemistry, Food Biotechnology, Functional Foods, Metabolic Biology of Foods and World Food Habits & Chronic Disease Challenges

i) Food Science 102: World Food Habits (3 CR) This course is designated to meet the Global Education requirement of College of Social and Behavioral Sciences at UMASS.

ii) Food Science 261: Introduction to Food Science and Biotechnology (3 CR)

iii) Food Science 722: Food Biotechnology (3 CR)

iv) Food Science Graduate Seminar:

Metabolic Biology of Functional Foods (2 CR)

Research Interests:

****Metabolic Biology of Functional Foods**

****Global Food Systems Biology concepts to combat Diet-linked Chronic Diseases and advancing Food Safety strategies.**

****Food Diversity and Indigenous Food Systems to Combat Diet-Linked Chronic Diseases.**

****Environmental Impact on Chronic Diseases & Nutritional Solutions using stress adapted food systems.**

Specifically my research interests focus on molecular and physiological regulation of phenolic metabolites and phenylpropanoid pathway by proline-linked pentose phosphate pathway and redox-regulated pathways in food plants, food-associated bacteria, fungi and mammalian systems.

This focus on phenolic-linked "Redox Biology" is contributing substantially to innovative research advances in the areas of **Ingredient biosynthesis, Food Safety, Nutrition, Functional Foods, Biofuels and Environmental adaptation of biological systems.**

a) Food Metabolic Biology:

- **Genetic and physiological regulation** of synthesis and mobilization of phenolic antioxidants, anti-microbial, anti-inflammatory, cancer chemopreventive metabolites, phyto-estrogens and flavors in **food plants** and by **Microbial-based solid state bio-processing** of cereals, grain legumes, fruits and vegetables with focus on phenolic metabolites and role of **proline-linked pentose phosphate pathway and Redox Biology in phenolic biosynthesis.**

- **Molecular and Biochemical Bioassay models** using bacterial, yeast, mammalian cell culture and mice models to screen antioxidants, anti-microbial, anti-cancer and immune modulating phenolic phytochemicals and role of **proline-linked pentose phosphate pathway and antioxidant enzyme response pathway.**

b) Food Systems Biology:

Using of metabolic critical control points of cellular energy pathways to design functional foods to combat diet-linked chronic diseases and food safety challenges. Integration of Proline-linked Redox Biology for understanding cellular protection and disease development using Traditional Diet and Food Diversity. Lignocellulose-based food and clean energy systems and role of Redox Biology.

Awards and Scholarships/Fellowships

- 1) Awarded **8 gold medals for academic excellence** at the University of Agricultural Sciences, Bangalore, India.
- 2) **Science and Technology Post-doctoral Fellowship** of Japan government (1990-1991).
- 3) University of Massachusetts, **Lilly Teaching Fellowship** to promote and encourage promising young faculty (1995-1996).
- 4) University of Massachusetts, College of Food and Natural Resources; **Outstanding Teacher Award** (1996-1997).
- 5) Asia-Pacific Clinical Nutrition Society **Award** (1998-1999)
- 6) University of Massachusetts - College of Food and Natural Resources; **Certificate of Achievement for Outstanding Outreach Contributions**, 2001
- 7) **Jefferson Science Fellow** at the US State Department (2004-2005)
- 8) University of Massachusetts, Award for **Outstanding Accomplishments in Research and Creative Activity**, 2005

Professional Memberships

Institute of Food Technologists
 Asia Pacific Clinical Nutrition Society
 American Society of Microbiology
 American Chemical Society
 American Association for Advancement of Sciences
 American Society of Plant Biologists

Publications (Peer-Reviewed Journals)

1. Shetty, K., Crawford, D. L. and Pometto, A. L. (1986). Production of L-phenylalanine from starch by analog resistant mutants of *Bacillus polymyxa*. **Appl. Environ. Microbiol.**, 52:637-643.
2. Shetty, K., Crawford, D. L., Korus, R. A., and Pometto, A. L. (1988). Amylase activity and L-phenylalanine overproduction from starch by analog resistant mutant of *Bacillus polymyxa*. **Appl. Biochem. Biotechnol.**, 17:347-355.
3. Shetty, K., Korus, R. A. and Crawford, D. L. (1989). Growth kinetics and phenolics production in *Glycine max* cell suspension cultures. **Appl. Biochem. Biotechnol.**, 20/21:825-843.
4. Shetty, K., Bothra, D., Crawford, D. L. and Korus, R. A. (1990). Extracellular peroxidase as an indicator of growth in plant cell suspension cultures. **Appl. Biochem. Biotechnol.**, 24/25:213-221.
5. Suh, H. W., Crawford, D. L., Korus, R. A. and Shetty, K. (1991). Production of antifungal metabolites by the ectomycorrhizal fungus *Pisolithus tinctorius* strain SMF. **J. Industrial Microbiol.**, 8:29-36.
6. Chein, C. T., Shetty, K., Mortimer, M. and Orser, C. S. (1991). Calcium-induced salt tolerance in *Rhizobium leguminosarum* biovar viciae strain C1204b. **FEMS Microbiol. Lett.**, 83:219-224.
7. Shetty, K. and Asano, Y. (1991). The influence of organic nitrogen sources on the induction of embryogenic callus in *Agrostis alba* L. **J. Plant Physiol.**, 139:82-85.

8. Shetty, K. and Asano, Y. (1991). Specific selection of embryogenic cell lines in *Agrostis alba* L using the proline analog thioproline. **Plant Science**, 79:259-263.
9. Shetty, K., Asano, Y. and Oosawa, K. (1992). Stimulation of *in vitro* shoot organogenesis in *Glycine max* (Merrill) by allantoin and amides. **Plant Science**, 81:245-251.
10. Shetty, K., Shetty, G. A., Ezura, H. and Oosawa, K. (1992). Stimulation of benzyladenine-induced *in vitro* shoot organogenesis from cotyledons of *Cucumis sativa* L by proline and abscisic acid. **Plant Tissue Culture Lett.**, 9:104-108
11. Shetty, K., Shetty, G. A., Nakazaki, Y., Yoshioka, K., Asano, Y. and Oosawa, K. (1992). Stimulation of benzyladenine-induced *in vitro* shoot organogenesis in *Cucumis melo* L by proline, salicylic acid and aspirin. **Plant Science**, 84:193-199.
12. Shetty, K. and McKersie, B. D. (1993). Proline, thioproline and potassium mediated stimulation of somatic embryogenesis in alfalfa (*Medicago sativa* L). **Plant Science**, 88:185-193.

--Since joining the University of Massachusetts--

13. Shetty, K., Curtis, O.F., Levin, R.E., Witkowsky, R. and Ang, W. (1995). Prevention of vitrification associated with *in vitro* shoot culture of oregano (*Origanum vulgare*) by *Pseudomonas* spp. **J. Plant Physiol.**, 147:447-451.
14. Curtis, O.F., Shetty, K., Cassagnol, G. and Peleg, M. (1996). Comparison of the inhibitory and lethal effects of plant metabolites (anethole, carvacrol, eugenol and thymol) on a food spoilage yeast (*Debaromyces hansenii*). **Food Biotechnology**, 10: 55-73.
15. Shetty, K., Curtis, O.F. and Levin, R.E. (1996). Specific interaction of mucoid strains of *Pseudomonas* spp. with oregano (*Origanum vulgare*) clones and the relationship to prevention of hyperhydricity in tissue culture. **J. Plant Physiol.**, 149: 605-611.
16. Shetty, K., Carpenter, T.L., Kwok, D., Curtis, O.F. and Potter, T.L. (1996). Selection of high phenolics-containing clones of thyme (*Thymus vulgaris* L.) using *Pseudomonas* spp. **J. Agric. Food Chem.**, 44:3408-3411.
17. Shetty, K., Carpenter, T., Curtis, O.F. and Potter, T.L. (1996). Reduction of hyperhydricity in tissue cultures of oregano (*Origanum vulgare*) by extracellular polysaccharide isolated from *Pseudomonas* spp. **Plant Science**, 120:175-183.
18. Eguchi, Y., Curtis, O.F. and Shetty, K. (1996). Interaction of hyperhydricity-preventing *Pseudomonas* spp. with oregano (*Origanum vulgare*) and selection of high rosmarinic acid-producing clones. **Food Biotechnology**, 10:191-202.
19. Kwok, D. and Shetty, K. (1996). *Pseudomonas* spp-mediated regulation of total phenolics and rosmarinic acid in thyme (*Thymus vulgaris*) clonal lines. **J. Food Biochemistry**, 20:365-377.
20. Ueno, K. and Shetty, K. (1997). Effect of selected polysaccharide-producing soil bacteria on hyperhydricity control in oregano tissue cultures. **Applied Environmental Microbiol.**, 63:767-770.

21. Shetty, K., Ohshima, M., Murakami, T., Oosawa, K. and Ohashi, Y. (1997). Transgenic melon (*Cucumis melo* L.) and potential for expression of novel proteins important to food industry. **Food Biotechnology**, 11:111-128.
22. Yang, R., Curtis, O.F. and Shetty, K. (1997). Selection of high rosmarinic acid-producing clonal lines of rosemary (*Rosmarinus officinalis*) via tissue culture using *Pseudomonas* sp. **Food Biotechnology**, 11:73-88.
23. Eguchi, Y., Bela, J.S. and Shetty, K. (1997). Stimulation of somatic embryogenesis in anise (*Pimpinella anisum*) by fish protein hydrolysates in combination with proline. **J. Herbs, Spices and Medicinal Plants**, 5:61-68.
24. Zheng, Z. and Shetty, K. (1998). Cranberry processing waste for solid-state fungal inoculant production. **Process Biochemistry**, 33:323-329.
25. Kwok, D. and Shetty, K. (1998). Effect of proline and proline analogs on total phenolic and rosmarinic acid levels in shoot clones of thyme (*Thymus vulgaris* L.). **J. Food Biochemistry**, 22:37-51.
26. Zheng, Z. and Shetty, K. (1998). Solid state production of beneficial fungi on apple processing waste using glucosamine as the indicator of growth. **J. Agric. Food Chem.**, 46:783-787.
27. Ueno, K., Cheplick, S. and Shetty, K. (1998) Reduced hyperhydricity and enhanced growth of tissue culture-generated raspberry (*Rubus* sp.) clonal lines by *Pseudomonas* sp. isolated from oregano. **Process Biochemistry**, 33:229-238.
28. Komali, A.S. and Shetty, K. (1998). Comparison of the growth pattern and rosmarinic acid production in rosemary (*Rosmarinus officinalis*) shoots and genetically transformed callus cultures. **Food Biotechnology**, 12:27-41.
29. Milazzo, M.C., Kellet, G., Haynesworth, K. and Shetty, K. (1998) Regulation of benzyladenine-induced *in vitro* shoot organogenesis and endogenous proline in melon (*Cucumis melo* L.) by exogenous proline, ornithine and proline analogs. **J. Agric. Food Chem.**, 46:2402-2406.
30. Yang, R. and Shetty, K. (1998) Stimulation of rosmarinic acid in shoot cultures of oregano (*Origanum vulgare*) clonal line in response to proline, proline analog and proline precursors. **J. Agric. Food Chem.**, 46:2888-2893.
31. Ueno, K. and Shetty, K. (1998) Prevention of hyperhydricity in oregano shoot cultures is sustained through multiple subcultures by selected polysaccharide-producing soil bacteria without re-inoculation. **Appl. Microbiol. Biotechnology**, 50:119-124.
32. Komali, A.S., Peleg, M., Gerhards, C. and Shetty, K. (1998) A study of the cell wall mechanical properties in unhyperhydrated shoots of oregano (*Origanum vulgare*) inoculated with *Pseudomonas* sp. by load deformation analysis. **Food Biotechnology**, 12:209-220.
33. Zheng, Z., Pinkham, J.L. and Shetty, K. (1998) Identification of polymeric dye-tolerant oregano (*Origanum vulgare*) clonal lines by quantifying total phenolics and peroxidase activity. **J. Agric. Food Chem.**, 46:4441-4446.
34. Bela, J., Ueno, K. and Shetty, K. (1998). Control of hyperhydricity in anise (*Pimpinella anisum*) tissue cultures by *Pseudomonas* spp. **J. Herbs, Spices and Medicinal Plants**, 6:47-57.

Post-Tenure (University of Massachusetts)

35. Bela, J. and Shetty, K. (1999) Somatic embryogenesis in anise (*Pimpinella anisum* L.) : The effect of proline on embryogenic callus formation and ABA on advanced embryo development. **J. Food Biochemistry**, 23:17-32.
36. Zheng, Z., Levin, R.E., Pinkham, J.L. and Shetty, K. (1999) Decolorization of polymeric dyes by a novel *Penicillium* isolate . **Process Biochemistry**, 34:31-37.
37. Milazzo, M.C., Zheng, Z., Kellet, G., Haynesworth, K., and Shetty, K., (1999) Stimulation of benzyladenine-induced in vitro shoot organogenesis and endogenous proline in melon (*Cucumis melo* L) by fish protein hydrolysates in combination with proline analogs. **J. Agric. Food Chem.**, 47:1771-1775.
38. Andarwulan, N., and Shetty, K. (1999) Phenolic synthesis in differentiated tissue cultures of untransformed and *Agrobacterium*-transformed roots of anise (*Pimpinella anisum* L.). **J. Agric. Food Chem.**, 47:1776-1780.
39. Zheng, Z. and Shetty, K. (1999) Effect of apple pomace-based *Trichoderma* inoculants on seedling vigor in pea (*Pisum sativum*) germinated in potting soil. **Process Biochemistry**, 34:731-735.
40. Perry, P., Ueno, K. and Shetty, K. (1999) Reversion to hyperhydration by addition of antibiotics to remove *Pseudomonas* in unhyperhydrated oregano tissue cultures. **Process Biochemistry**, 34:717-723.
41. Perry, P.L. and Shetty, K. (1999) A model for involvement of proline during *Pseudomonas*-mediated stimulation of rosmarinic acid. **Food Biotechnology**, 13:137-154.
42. Komali, A.S., Zheng, Z. and Shetty, K. (1999) A mathematical model for the growth kinetics and total phenolics synthesis in *Pseudomonas* species inoculated shoot cultures of oregano (*Origanum vulgare*) **Process Biochemistry**, 35:227-235.
43. Al-Amier, H., Mansour, B.M.M., Toaima, N., Korus, R.A. and Shetty, K. (1999) Tissue culture-based screening for selection of high biomass and phenolic-producing clonal lines of Lavender using *Pseudomonas* and azetidine-2--carboxylate. **J. Agric. Food Chem.**, 47:2937-2943.
44. Andarwulan, N. and Shetty, K. (1999) Antioxidant activity associated with lipid and total phenolic mobilization during seed germination of *Pangium edule* Reinw. **J. Agric. Food.Chem.**, 47:3158-3163.
45. Andarwulan, N., Fardiaz, S., Apriyantono, A., Hariyadi, P. and Shetty, K. (1999) Mobilization of primary metabolites and phenolics during natural fermentation in seeds of *Pangium edule* Reinw. **Process Biochemistry**, 35:197-204.
46. Andarwulan, N. and Shetty, K. (1999) Improvement of pea (*Pisum sativum*) seed vigor by fish protein hydrolysates in combination with acetyl salicylic acid. **Process Biochemistry**, 35:159-165.
47. Eguchi, Y., Milazzo, M.C., Ueno, K. and Shetty, K. (1999) Partial improvement of vitrification and acclimation of oregano (*Origanum vulgare*) tissue cultures by fish protein hydrolysates. **J. Herbs, Spices and Medicinal Plants**, 6:29-38.

48. Andarwulan, N. and Shetty, K. (1999) Influence of fish protein hydrolysates in combination with acetyl salicylic acid on hyperhydricity reduction and phenolic synthesis in oregano (*Origanum vulgare*) tissue cultures. **J. Food Biochemistry**, 23:619-635.
49. Duval, B., Shetty, K. and Thomas, W.H. (1999) Phenolic compounds and antioxidant properties in the snow alga *Chlamydomonas nivalis* after exposure to UV light. **J. Applied Phycology**, 11:559-566.
50. Al-Amier, H., Mansour, B.M.M., Toaima, N. Korus, R.A and Shetty, K. (1999) Screening of high biomass and phenolic-producing clonal lines of Spearmint in tissue culture using *Pseudomonas* and azetidine-2-carboxylate. **Food Biotechnology**, 13:227-253.
51. McCue, P., Zheng, Z., Pinkham, J.L. and Shetty, K. (2000) A model for enhanced pea seedling vigor following low pH and salicylic acid treatments. **Process Biochemistry**, 35:603-613.
52. Zheng, Z. and Shetty, K. (2000) Azo dye-mediated regulation of total phenolics and peroxidase activity in thyme (*Thymus vulgaris* L.) and rosemary (*Rosmarinus officinalis* L.) clonal lines. **J. Agric. Food Chem.**, 48:932-937.
53. Zheng, Z. and Shetty, K. (2000) Solid-state bioconversion of phenolics from cranberry pomace and role of *Lentinus edodes* beta-glucosidase **J. Agric. Food Chem.**, 48:895-900.
54. Zheng, Z. and Shetty, K. (2000) Solid-state production of polygalacturonase by *Lentinus edodes* using fruit processing wastes. **Process Biochemistry**, 35:825-830.
55. Andarwulan, N. and Shetty, K. (2000) Stimulation of novel phenolic metabolite, epoxy-Pseudoisoeugenol-(2-Methylbutyrate) [EPB], in transformed anise (*Pimpinella anisum* L.) root cultures by fish protein hydrolysates. **Food Biotechnology**, 14:1-20.
56. Zheng, Z. and Shetty, K. (2000) Enhancement of pea (*Pisum sativum*) seedling vigor and associated phenolic content by extracts of apple pomace fermented with *Trichoderma* spp. **Process Biochemistry**, 36:79-84.
57. Zheng, Z., Sheth, U., Nadiga, M., Pinkham, J.L. and Shetty, K. (2001) A model for the role of proline-linked phenolic synthesis and peroxidase activity associated with polymeric dye tolerance in oregano. **Process Biochemistry**, 36:941-946.
58. Al Ameir, H.A., Mansour, B.M.M., Toaima, N., Craker, L. and Shetty, K. (2001) Tissue culture for phenolics and rosmarinic acid in thyme **J. Herbs, Spices and Medicinal Plants**, 8:31-42.
59. Shetty, P., Atallah, M.T. and Shetty, K. (2001) Enhancement of total phenolic, L-DOPA and proline contents in germinating fava bean (*Vicia faba*) in response to bacterial elicitors. **Food Biotechnology**, 15:47-67.
60. Duval, B. and Shetty K. (2001) The stimulation of phenolics and antioxidant activity in pea (*Pisum sativum*) elicited by genetically transformed anise root extract. **J. Food Biochemistry**, 25:361-377
61. Kaspera, R., McCue, P. and Shetty, K. (2001) Partial purification of a basic guaiaciol peroxidase from fava bean (*Vicia faba* L.): Characterization of enzyme stability following elicitor treatment. **Food Biotechnology**, 15: 99-111.
62. McCue, P. and Shetty, K. (2002) Clonal herbal extracts as elicitors of phenolic synthesis in dark-germinated mungbeans for improving

- nutritional value with implications for food safety. **J. Food Biochemistry**, 26: 209-232.
63. Strycharz, S. and Shetty, K. (2002) Peroxidase activity and phenolic content in elite clonal lines of *Mentha pulegium* in response to polymeric dye R-478 and *Agrobacterium rhizogenes*. **Process Biochemistry**, 37: 805-812
 64. Shetty, P., Atallah, M.T. and Shetty, K. (2002) Effects of UV treatment on the proline-linked pentose phosphate pathway for phenolics and L-DOPA synthesis in dark germinated *Vicia faba*. **Process Biochemistry**, 37: 1285-1295.
 65. Randhir, R., Shetty, P. and Shetty, K. (2002) L-DOPA and total phenolic stimulation in dark germinated fava bean in response to peptide and phytochemical elicitors. **Process Biochemistry**, 37:1247-1256.
 66. McCue, P. and Shetty, K. (2002) A biochemical analysis of mungbean (*Vigna radiata*) response to microbial polysaccharides and potential phenolic-enhancing effects for nutraceutical applications. **Food Biotechnology**, 16:57-79.
 67. Strycharz, S. and Shetty, K. (2002) Response of oregano (*Origanum vulgare*) clonal lines to *Pseudomonas* sp. Z strain and polydye R-478 and implications for hyperhydricity prevention in tissue culture. **Process Biochemistry**, 38:343-350.
 68. Strycharz, S. and Shetty, K. (2002) Effect of *Agrobacterium rhizogenes* on phenolic content of *Mentha pulegium* elite clonal line for phytoremediation applications. **Process Biochemistry**, 38:287-293.
 69. Vatterem, D.A. and Shetty, K. (2002) Solid-state production of phenolic antioxidants from cranberry pomace by *Rhizopus oligosporus*. **Food Biotechnology**, 16:189-210.
 70. Randhir, R. and Shetty, K. (2003) Light-mediated fava bean (*Vicia faba*) response to phytochemical and protein elicitors and consequences on nutraceutical enhancement and seed vigor. **Process Biochemistry**, 38: 945-952.
 71. Shetty, P., Atallah, M.T. and Shetty, K. (2003) Stimulation of total phenolics, L-DOPA and antioxidant activity through proline-linked pentose phosphate pathway in response to proline and its analog in germinating fava beans (*Vicia faba*) **Process Biochemistry**, 38: 1707-1717.
 72. McCue, P. and Shetty, K. (2003) Role of carbohydrate-cleaving enzymes in phenolic antioxidant mobilization from whole soybean fermented with *Rhizopus oligosporus*. **Food Biotechnology**, 17:27-37.
 73. Seaberg, A., Labbe, R.L. and Shetty, K. (2003) Inhibition of *Listeria monocytogenes* by elite clonal extracts of oregano (*Origanum vulgare*). **Food Biotechnology**, 17: 129-149.
 74. Vatterem, D.A. and Shetty, K. (2003) Acrylamide in food: Probable mechanisms of formation and its reduction. **Innovative Food Science and Emerging Technologies**, 4: 331-338.
 75. McCue, D.A., Horii, A and Shetty, K. (2003) Solid-state bioconversion of phenolic antioxidants from defatted powdered soybean by *Rhizopus oligosporus*: Role of carbohydrate cleaving enzymes. **J. Food Biochemistry**, 27: 501-514.

76. Vатtem, D.A. and Shetty, K. (2003) Ellagic acid production and phenolic antioxidant activity in cranberry pomace mediated by *Lentinus edodes* using solid-state system. **Process Biochemistry**, 39: 367-379.
77. Randhir, R., Lin, Y-T. and Shetty, K. (2004) Stimulation of phenolics, Antioxidant and antimicrobial activities in dark germinated mung bean (*Vigna radiata*) sprouts in response to peptide and phytochemical elicitors. **Process Biochemistry**, 39: 637-646.
78. Vатtem, D.A., Lin, Y.T., Labbe, R.G. and Shetty, K. (2004) Phenolic antioxidant mobilization in cranberry pomace by solid-state bioprocessing using food grade fungus *Lentinus edodes* and effect on antimicrobial activity against select food-borne pathogens. **Innovative Food Science and Emerging Technologies**, 5: 81-91.
79. McCue, P., and Shetty, K. (2004). Inhibitory effects of rosmarinic acid extracts on porcine pancreatic amylase and implications for health. **Asia Pacific Journal of Clinical Nutrition**, 13: 101-106.
80. Randhir, R., Vатtem, D. and Shetty, K. (2004) Solid-state bioconversion of fava bean by *Rhizopus oligosporus* for enrichment of phenolic antioxidants and L-DOPA. **Innovative Food Science and Emerging Technologies**, 5: 235-244.
81. Randhir, R. and Shetty, K. (2004) Microwave-induced stimulation of L-DOPA, phenolics and antioxidant activity in fava bean (*Vicia faba*) for Parkinson's diet. **Process Biochemistry**, 39: 1775-1784.
82. McCue, P. and Shetty, K. (2004) A role for amylase and peroxidase-linked polymerization in phenolic antioxidant mobilization in dark-germinated soybean and implications for health. **Process Biochemistry**, 39: 1785-1791.
83. McCue P., Lin Y-T., Labbe, R.G. and Shetty, K. (2004) Sprouting and solid-state bioprocessing by *Rhizopus oligosporus* increase the *in vitro* antibacterial activity of aqueous soybean extracts against *Helicobacter pylori*. **Food Biotechnology**, 18: 229-249.
84. Vатtem, D.A., Lin, Y.T., Labbe, R.G. and Shetty, K. (2004) Antimicrobial activity against select food-borne pathogens by phenolic antioxidants enriched cranberry pomace by solid-state bioprocessing using food-grade fungus *Rhizopus oligosporus*. **Process Biochemistry**, 39: 1939-1946.
85. Correia, R.T.P., McCue, P., Margarida, M.A.M., Macedo, G.R. and Shetty, K (2004) Production of phenolic antioxidants by solid-state bioconversion of pineapple waste mixed with soy flour using *Rhizopus oligosporus*. **Process Biochemistry**, 39: 2167-2172.
86. Lin. Y-T., Labbe, R.G. and Shetty, K. (2004) Inhibition of *Listeria monocytogenes* in fish and meat systems using oregano and cranberry synergies. **Applied and Environmental Microbiology**, 70: 5672-5678.
87. McCue. P., Horii, A. and Shetty, K. (2004) Mobilization of phenolic antioxidants from defatted soybean powders by *Lentinus edodes* during solid-state fermentation is associated with enhanced production of laccase. **Innovative Food Science and Emerging Technologies**, 5: 385-392.
88. Randhir, R., Lin, Y-T. and Shetty, K. (2004) Phenolics, antioxidant and antimicrobial activity in dark germinated fenugreek sprouts in response to peptide and phytochemical elicitors. **Asia Pacific Journal of Clinical Nutrition**, 13: 295-307.
89. Correia, R.T.P., McCue, P., Margarida, M.A.M., Macedo, G.R. and Shetty, K (2004) Solid-state bioconversion of guava waste mixed with soy flour

- using *Rhizopus oligosporus* to enhance phenolic antioxidants. **J. Food Biochemistry**, 28: 404-418.
90. Correia, R.T.P., McCue, P., Vатtem, D.A., Margarida, M.A.M., Macedo, G.R. and Shetty, K (2004) Amylase and *Helicobacter pylori* inhibition by phenolic extracts of pineapple wastes bioprocessed by *Rhizopus oligosporus*. **J. Food Biochemistry**, 28: 419-434.
 91. McCue, P., Vатtem, D.A. and Shetty, K. (2004) Inhibitory effect of clonal oregano extracts against porcine pancreatic amylase *in vitro*. **Asia Pacific Journal of Clinical Nutrition**, 13: 401-408.
 92. Chun, S-S., Vатtem, D.A., Lin, Y-T. and Shetty, K. (2005) Phenolic antioxidants from clonal oregano (*Origanum vulgare*) with antimicrobial activity against *Helicobacter pylori*. **Process Biochemistry**, 40: 809-816.
 93. McCue, P. and Shetty, K. (2005) A Model for the Involvement of Lignin Degradation Enzymes in Phenolic Antioxidant Mobilization from Whole Soybean During Solid-state Bioprocessing by *Lentinus edodes*. **Process Biochemistry**, 40: 1143-1150.
 94. Vатtem, D.A., Lin, Y-T., Ghaedian, R. and Shetty, K. (2005) Cranberry synergies for dietary management of *Helicobacter pylori* infections. **Process Biochemistry**, 40: 1583-1592.
 95. McCue, P. and Shetty, K. (2005) Phenolic antioxidant mobilization during yogurt production from soymilk. **Process Biochemistry**, 40: 1791-1797.
 96. Vатtem, D.A., Randhir, R. and Shetty, K. (2005) Cranberry phenolics-mediated elicitation of antioxidant enzyme response in fava bean (*Vicia faba*) sprouts. **J. Food Biochemistry**, 29: 41-70.
 97. Randhir, R. and Shetty, K. (2005) Developmental stimulation of total phenolics and related antioxidant activity in light and dark-germinated corn by natural elicitors. **Process Biochemistry**, 40: 1721-1732.
 98. Lin, Y-T., Vатtem, D.A., Labbe, R.G. and Shetty, K. (2005) Enhancement of antioxidant activity and inhibition of *Helicobacter pylori* by phenolic phytochemical enriched alcoholic beverages. **Process Biochemistry**, 40: 2059-2065.
 99. Randhir, R., Vатtem, D.A. and Shetty, K. (2005) Antioxidant enzyme response studies in H₂O₂-stressed porcine muscle tissue following treatment with Oregano phenolic extracts. **Process Biochemistry**, 40: 2123-2134.
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Concept, Hypothesis and Review Papers

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3. Shetty, K and McCue, P. (2003). Phenolic antioxidant biosynthesis in plants for functional food application: Integration of Systems Biology and Biotechnological Approaches. **Food Biotechnology**, 17:67-97.
4. Shetty, K. (2004) Role of proline-linked pentose phosphate pathway in biosynthesis of plant phenolics for functional food and environmental applications; A review. **Process Biochemistry**, 39:789-804.
5. Shetty, K and Wahlqvist, M.L. (2004) A model for the role of proline-linked pentose phosphate pathway in phenolic phytochemical biosynthesis and mechanism of action for human health and environmental applications; A Review. **Asia Pacific J. Clinical Nutrition**, 13: 1-24.
6. McCue, P. and Shetty, K. (2004) A hypothetical model for the action of soybean isoflavonoids against cancer involving a shift to proline-linked energy metabolism through activation of the pentose phosphate pathway. **Food Biotechnology**, 18: 19-37.
7. McCue, P. and Shetty, K. (2004) Health benefits of Soy Isoflavonoids and Strategies for Enhancement: A Review. **Critical Reviews in Food Science and Nutrition**, 44: 1-7.
8. Vatter, D.A., Ghaedian, R. and Shetty, K. (2005) Enhancing health benefits of cranberry through phenolic antioxidant enrichment. **Asia Pacific J. Clinical Nutrition**, 14: 120-130.
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Book Chapters

1. Shetty, K. (1999) Phytochemicals: Biotechnology of phenolic phytochemicals for food preservatives and functional food applications. In: Wiley Encyclopedia of Food Science and Technology, 2nd Edition, Edited by F.J.Francis, Wiley Publishers, NY. pgs.1901-1909.
2. Zheng, Z. and Shetty, K. (1999) Solid-state fermentation and value-added utilization of fruit and vegetable processing by-products. In: Wiley Encyclopedia of Food Science and Technology, 2nd Edition, Edited by F.J.Francis, Wiley Publishers, NY. pgs.2165-2174.
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4. McCue, P. and Shetty, K. (2005) Principles of Biochemistry and Molecular Biology. In: **Food Biotechnology, 2nd Edition** [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 19-32.
5. McCue, P. and Shetty, K. (2005) Potential Health Benefits of Soybean Isoflavonoids and Related Phenolic Antioxidants. In: **Food Biotechnology, 2nd Edition** [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 771-787 & In: **Functional Foods & Biotechnology (2006)** (Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 133-149.
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 8. Randhir, R. and Shetty, K. (2005) Biotechnology of Non-nutritive sweeteners. **In: Food Biotechnology, 2nd Edition** [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. Marcel Dekker and CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 915-932 & **In: Functional Foods & Biotechnology (2006)** (Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)). CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 327-344.
 9. Smith-Schneider, S. Roberts, L.A. and Shetty, K. (2005) Phytochemicals and Breast Cancer Chemoprevention. **In: Food Biotechnology, 2nd Edition** [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. Marcel Dekker and CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 867-897 & **In: Functional Foods & Biotechnology (2006)** (Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)). CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 253-283.
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14. Shetty, K. (2005) Solid-state bioprocessing for functional food ingredients and food waste remediation. In: **Food Biotechnology, 2nd Edition** [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. Marcel Dekker and CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 1691-1704 & In: **Functional Foods & Biotechnology (2006)** (Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL. Pages 611-624.
15. Bhowmick, P.C., Shetty, K. and Sarkar, D. (2007) Cold Stress Response of Cool Season Turf Grass: Antioxidant Mechanisms. In: Turf Grass Management and Physiology, (Pessarakli, M. (ed). CRC Press, Boca Raton, FL. Pages 507-530.
16. Ray, R.C., Shetty, K. and Ward, O.P. (2008), Solid State Fermentation and Value-Added Utilization of Horticultural Processing Wastes. In: Microbial Biotechnology in Horticulture, Volume 3, Eds. R.C. Ray and O.P. Ward, Science Publishers, Inc, NH, USA, pp.231-272.

Manuscripts in Conference Proceedings (All UMASS work)

1. Shetty, K. and Curtis, O.F. (1995). The biotechnology of plant secondary metabolites and their applications in food. In: Proceedings of Indonesian Workshop on "Benefits of Traditional Food", Jakarta, June 9-11, 1995. Indonesia.
2. Bela, J. S. and Shetty, K. (1996). *In vitro* developmental response of anise to growth regulators and establishment of a clonal propagation system. *Acta Horticulturae*, 426:483-487.
3. Curtis, O. F. and Shetty, K. (1996). Growth medium effects on vitrification, total phenolics, chlorophyll and water content of *in vitro* propagated oregano clones. *Acta Horticulturae*, 426:489-503.
4. Kellet, G., Reid, J. and Shetty, K. (1996). Bacterial-mediated stimulation of phenolics and control of vitrification in clonal line of oregano. *Acta Horticulturae*, 426:505-509.
5. Shetty, K., Nadiga, M., Zheng, Z. and Lanza, G. (1997). Phytoremediation of aromatic pollutants and selection of elite clones. Proceedings of Tsukuba Advanced Research Alliance Symposium; Feb. 21, 1997, Tsukuba University, Japan.
6. Shetty, K., Nadiga, M., Zheng, Z. and Lanza, G. (1997). Phytoremediation of aromatic pollutants and selection of elite clones. Proceedings of Microbial-Based Technologies for Pollution Abatement of Laguna DeBay, Manila. Sponsored by University of the Philippines and Japanese Society for Promotion of Science; Feb. 25-27, 1997, Makato City, Philippines.
7. Shetty, K., Kwok, D. and Labbe, R.G. (1997). Antioxidants and antimicrobials from elite thyme clones. In: Proceedings of Herb '97 - International Herb Conference, Danvers, July 10-14, 1997, MA.
8. Shetty, K. and Labbe, R.G. (1998). Food borne pathogens, health and role of dietary phytochemicals. In: Proceedings of 2nd Asia-Pacific Clinical Nutrition Society Conference, Mar, 1998, Kuching, Malaysia. In: Asia Pacific J. Clinical Nutrition, Vol: 7: 270-276.
9. Shetty, K. (2000). A rationale integrated approach to scientific and commercial development of botanical nutraceuticals. In: Proceeding of the Vitafoods International Conference, May, 2000, Geneva, Switzerland.
10. Shetty, K. (2002). "Botanical Ingredients as Nutraceuticals".

In:Proceedings of Vitafoods International Conference, Geneva, Switzerland, May, 2002.

11. Shetty, K., Lin, Y-T., McCue, P., Labbe, R.G., Randhir, R. and Ho, C-H. (2003) Low microbial load sprouts with enhanced antioxidants for Astronaut diet. In Proceeding of International Conference On Environmental Systems, Vancouver, BC; Canada, July, 2003.
12. Shetty, K. (2007) Estrategias de Comercializacion en Biotecnologia y Ciencias de la vida: Desafios. In Proceedings (Textos) Gestion-Innovacion y Comercializacion en Biotecnologia (Gil, L and Adonis, M. (eds)). Editorial Universitaria (University of Chile, Santiago).

Patents (All from UMASS work)

1. Shetty, K. (1999). Plant Clones Containing Elevated Secondary Metabolite Levels "U.S. Patent" # 5,869,340.
2. Shetty, K., Zheng, Z. and Levin, R. (1999). *Penicillium* strain for Bioremediation "U.S. Patent" # 5,877,014.
3. Shetty, K. (1999). Fruit Pomace Compositions and Uses Thereof "U.S. Patent" # 5,882,641.
4. Shetty, K. (1999). Plant Propagation Compositions and Methods "U.S. Patent" # 5, 906,941.

Invited Lectures and Seminars

1. Givaudan Roure, Clifton, NJ; June 1994. Biotechnological applications for flavor production in plants.
2. Mannheimer, Inc., New York; Oct. 1994. Development of natural flavors from plants and microbes using biotechnology.
3. Ocean Spray, Middleboro, Massachusetts, Oct, 1994; Solid-state fermentation of cranberry wastes to produce value-added metabolites.
4. Bogor Agricultural University, Bogor, Indonesia, June 1995. Biotechnological approaches to harness the potential of secondary metabolite-producing plants.
5. Indonesian National Workshop on Benefits of Traditional Food, June , 1995, Jakarta, Indonesia. "Biotechnology of Plant Secondary Metabolites for Food Applications".
6. National Institute of Agrobiological Resources, Tsukuba, Japan, June 1995. Biotechnology of plant secondary metabolites for food and pharmaceutical applications.
7. Chiba University, Matsudo, Japan, Apr, 1996. Biotechnology of Plant Phenolics; Role in food applications and plant development.
8. National Institute of Agrobiological Resources, Tsukuba, Japan, April 1996. Use of PR-GUS Fusions in transgenic tobacco to select antiinflammatory metabolites in elite clones of oregano and thyme.
9. Goodman-Fielder Medical Oration, Dec, 1996, Monash University, Melbourne, Australia. "Biotechnology to Harness the Benefits of Dietary Phenolics: Focus on Lamiaceae".

10. Department of Medicine, Monash Medical Center; Monash University, Melbourne, Australia, Dec, 1996. Health benefits of phenolics from fermented legumes.
11. Department of Nutrition, University of Agricultural Sciences, Bangalore, India, Jan, 1997. Health benefits of dietary phytochemicals.
12. Tsukuba Advanced Research Alliance, University of Tsukuba, Japan, Feb, 1997. Phytoremediation of aromatic pollutants and selection of elite clones.
13. University of the Philippines and Japanese Society for Promotion of Science, Makato City, Philippines, Feb. 1997. Phytoremediation of aromatic pollutants and pollution abatement in Laguna DeBay using plants.
14. Inter-Mountain Institute of Food Technology Meeting, Mar, 1997, Sun Valley, Idaho. "Trends in Food Biotechnology: Market Opportunities for Idaho and Western States in the Asia-Pacific Region".
15. Department of Microbiology and Biochemistry, University of Idaho, April 1997. Regulation of phenolic synthesis in plants by microorganisms for food, pharmaceutical and environmental applications.
16. International Herb Conference, Herb '97, July, 1997, Danvers, MA. "Antioxidants and Antimicrobials from Elite Thyme Clones".
17. Faculty of Biological Sciences, University of de Nuevo Leon, San Nicolas, Mexico, Sept, 1997. Plant biotechnology and phytoremediation of aromatic pollutants.
18. Department of Biology and Biotechnology, Worcester Polytechnique Institute, Worcester, MA, Nov 1997. Regulation of phenylpropanoid pathway metabolites by proline-linked pentose phosphate pathway.
19. Asia-Pacific Clinical Nutrition Society, Kuching, Malaysia, Mar, 1998. "Food borne pathogens, health and role of dietary phytochemicals".
20. Ist Latin American Conference on Soil and Water Contamination, Organised by International School for Environmental Technology, USAID and World Bank, in Quito, ECUADOR, May, 1998. "Strategies for Phytoremediation of Aromatic Pollutants".
21. Seminar on 'Microbial Interaction Strategies for Phytochemicals and Functional Foods' to New England Society of Industrial Microbiology, Oct, 1998. Groton, CT.
22. Symposium on "Antioxidants and Oxidative Process in Health and Foods." Sponsored by the UMASS, Department of Food Science, Nov, 1998, Amherst, MA.
23. Danish Agricultural Research Institute, Arsløv., Denmark, Apr, 1999. "Phytochemicals and Functional Foods: Non-transgenic Biotechnology Strategies".
24. Norris Ltd., at Icelandic Fisheries Institute, Reykjavik, Iceland, July, 1999. Value-added products from fishery byproducts for food, nutraceutical and agricultural applications.
25. Hershey Foods, PA, USA. July, 1999. Non-transgenic Biotechnology for production of plant-based functional food ingredients for health and food preservation.

26. Decas Cranberry, MA, USA Aug, 1999. Nutraceutical value added products from processed cranberry
27. Novartis Nutrition, MN, USA. Sept, 1999. Integrated approach to the development of Nutraceuticals and Functional Foods.
28. Eastern Institute of Food Technology Conference, Hershey, PA, Oct, 1999. Emerging perspectives in Food Biotechnology: Non-transgenic approaches for plant-based functional ingredients for nutraceuticals and functional foods.
29. National University of Singapore, Department of Biological Sciences, Jan, 2000. " Emerging perspectives for the scientific development of nutraceuticals".
30. Bristol Myers Squibb, Wallingford, CT, Natural Products Group, Mar, 2000. "Technological innovations for consistency of botanical profiles for pharma applications".
31. Vitafoods International Conference, 2000, Geneva, Switzerland, May, 2000. Session on Natural and Herbal Products and Medicine: "A rationale integrated approach to scientific and commercial development of botanical nutraceuticals".
32. Ceres Listeria Round Table, Nov 2000, Georgetown University. "Elite herb extracts to control *Listeria*".
33. ETH-Zurich, Switzerland, Institute of Food Science, Dec 2000, "Biotechnology Strategies for development of Functional Foods".
34. Food Safety symposium, Clemson University, April, 2001. " Phytochemical extracts for control of food-borne pathogens.
35. Listeria Symposium, American Meat Institute Foundation, Dallas, Dec, 2001. " Elite clonal herb extracts and pH interaction on Listeria control in meats".
36. Vitafoods International Conference, 2002, Geneva, Switzerland, May, 2002. "Botanical Ingredients as Nutraceuticals".
37. Strategic Research Alliance, Department of Food Science, UMASS, Amherst, MA, May 2003. "Phytochemicals and Health a Systems Biology Approach".
38. International Conference on Environmental Systems, Vancouver, BC; Canada, July 2003 " Low microbial load sprouts with enhanced antioxidants for Astronaut diet".
39. Iowa State University and NASA Food Technology Commercial Space Center, Ames IA, October, 2003 "Metabolic Biology of Phytochemicals for Functional Food.
40. NE Society of Industrial Microbiology, Boston, MA, October, 2003", Plant-Microbe Interaction for functional food developments"
41. Central Food Technological Research Institute, Mysore, India, Jan 2004, " Systems and Metabolic Biology of Phytochemicals for Chemoprevention".
42. International Union of Biological Sciences, General Assembly, Cairo, Egypt, Jan 2004, Workshop Presentation " Systems Biology of Plants for Environmental Health.
43. Faculty of Biological Sciences, University of de Nuevo Leon, San Nicolas, Mexico, September, 2004. "Systems Biology and Biotechnology for Development of Functional Foods and Food Safety".

44. International Agri-Biotechnology Conference, University of Agricultural Sciences, Bangalore, India, December, 2004. " Integration of Systems Biology and Biotechnology for Improvement of Horticultural Crops".
45. Faculty of Sciences, St. Aloysius College, Mangalore, India, December, 2004. " Biotechnology strategies for improvement of functional foods and food safety".
46. Department of Food Science and Nutrition, Hannam University, Deajeon, South Korea, January, 2005. " Biotechnology Strategies for Design of Functional Foods".
47. Faculty of Life Sciences, Cheju National University, Cheju, South Korea, January, 2005 " Next Generation Food Biotechnology for Management of Human Health".
48. Department of Food Science, Seoul National University, Seoul, South Korea, January, 2005 " Next Generation Food Biotechnology for Design of Functional Foods".
49. Asia Biotech Forum, Kuala Lumpur, Malaysia, February, 2005 "Next Generation Food Biotechnology and University-led IP Development".
50. Biotechnology and Food Science Program, University Putra Malaysia, Selangor, Malaysia, February, 2005 "Next Generation Food Biotechnology for Management of Human Health".
51. Faculty of Horticulture, Chiba University, Matsudo, Japan, February, 2005 " Next Generation Food Biotechnology for Management of Human Health".
52. Universidad Autonómica Coahuila, Saltillo, Mexico; Biotechnology Program, February, 2005 " Next Generation Food Biotechnology for the Management of Human Health".
53. Purdue University, West Lafayette, IN; Department of Horticulture, March, 2005 "Strategies for Design of Horticultural Crops for Functional Food Applications".
54. National Institute of Health-NCI, March, 2005 " Role of proline-linked pentose phosphate pathway for phenolic synthesis in plants and relevance to human health".
55. Bose Institute and Kolkatta University, Kolkatta, India, April, 2005 " Next Generation Food Biotechnology to Manage Human Health".
56. University of Burdwan, Burdwan, West Bengal, India, April, 2005 " Next Generation Food Biotechnology to Manage Human Health".
57. Bangalore Bio, 2005; Bangalore, India; April 2005 " Biotechnology Strategies to Develop Functional Foods and Nutraceuticals".
58. Bangalore Bio, 2005; Bangalore, India; April 2005 " India and the Knowledge Economy: Biotechnology Potential of India". Address to Indo-German Business Group.
59. MARDI-Malaysian Agricultural Research and Development Institute, Kuala Lumpur, Malaysia; April 2005 "Next Generation Food Biotechnology to Manage Human Health".
60. BioMalaysia, 2005; Putra Jaya, Malaysia; April 2005 "Next Generation Food Biotechnology and Global Challenges".

61. American Center Library & University National Autonomous of Mexico, Mexico City; May, 2005 "Next Generation Food Biotechnology to Manage Human Health".
62. University Autonomous at Chappingo; Chappingo, Mexico; May 2005 "Next Generation Food Biotechnology to Manage Human Health".
63. CIATEJ-Center for Research and Assistance in Technology and Design (Food Technology) and Rural Development Secretariat; Guadalajara, Mexico; May 2005 "Biotechnology Strategies for Functional Foods and Food Safety".
64. Weizmann Institute of Science, Rehovot; Israel; May 2005 " Design of Functional Foods to Manage Human Health".
65. Volcani Research Institute, Bet Dagan; Israel; May 2005 " Biotechnology Strategies to Design Functional Foods".
66. Bio-Tech Israel; 2005, Tel Aviv; Israel; May 2005 " Biosynthesis of Dietary Phenolic Antioxidants for Metabolic Disorders".
67. Hebrew University; Revohot; Israel; May 2005 " Design of Functional Foods to Manage Human Health".
68. Taiwan Agricultural Research Institute, Taichung, Taiwan; June 2005; "Regulatory Policy Issues in GM Food and Environmental Safety".
69. American Corner, Taichung, Taiwan; June 2005; "Next Generation Food Biotechnology to Manage Human Health".
70. Department of Health, Taiwan; June 2005; " Microbial and GM Food Safety Challenges and Regulatory Issues".
71. American Institute of Taiwan and Taiwan Biotechnology Association, Taiwan; June 2005; " Commercialization of Biotechnology: The Challenges".
72. American Institute of Taiwan and Taiwan Biotechnology Association, Taiwan; June 2005; " University-Led Commercialization and IP Development: The Role of Bayh-Dole Act".
72. American Chamber of Commerce, Taipei, Taiwan; June 2005; " Commercialization of Biotechnology: The Challenges".
73. Taipei International Food Show, Taipei, Taiwan; June 2005; " Next Generation Food Biotechnology to Manage Human Health".
74. Karolinska Institute, Department of Medical Nutrition, Stockholm; Sweden; June, 2005; "Novel Regulation of Cellular Antioxidant Response for Chemoprevention of Diseases".
75. Danish Chamber of Commerce and US Embassy, Copenhagen, Denmark; June 2005; "Next Generation Food Biotechnology to Manage Human Health".
76. Royal Veterinary and Agricultural University, Fredricksberg, Denmark; June 2005; "Next Generation Food Biotechnology to Manage Human Health".
77. University of Life Sciences, As, Norway; June 2005; "Next Generation Food Biotechnology to Manage Human Health".
78. University of Sao Paulo; Sao Paulo, Brazil; July 2005; "Biotechnology Strategies to Design Functional Foods".
79. University of Campinas; Campinas, Brazil; July 2005; " Next Generation Food Biotechnology to Manage Human Health".

80. University of Londrina, Parana, Brazil; July 2005; " Next Generation Food Biotechnology to Manage Human Health".
81. University of Chile, Santiago, Chile; July 2005; "Biotechnology Strategies to Design Functional Foods".
82. Cheju National University, Jeju Island, South Korea; August, 2005; Workshop on "Biotechnology Strategies to Design Functional Foods".
83. International Seminar "Experiences de Empresas Biologicas de America Latina y el Caribe"; Bogota, Columbia; October 2005;"Commercialization Strategies in Life Sciences and Biotechnology: The Challenges".
84. International Seminar on Innovations and Commercialization in Biotechnology in Latin America; Santiago, Chile; December 2005 "Commercialization Strategies in Life Sciences and Biotechnology: The Challenges".
85. National Symposium on Biotechnology- "Bridging the Industry-Academia Gap", Organized by St. Aloysius College, Mangalore, India, January, 2006 " Current Developments in Food Biotechnology".
86. International Conference on Biotechnology Approaches for Alleviating Malnutrition and Human Health, Organized by University of Agricultural Sciences, Bangalore, Purdue University and USAID in Bangalore, India, January, 2006 " Advances in Molecular Nutrition: Integration of Phytochemicals and Antioxidant Response Pathways".
87. National Research Foundation of Greece, Athens, Greece; March, 2006, "Food Biotechnology: Design of Functional Foods to Manage Human Health."
88. Aristotelian University of Thessaloniki, Greece; March 2006 "Preventive Management of Disease and Phytochemicals: A New Perspective".
89. Food Chemistry and Plant Research International, Wageningen, Netherlands (Holland); April 2006 "Phytochemicals and Functional Food Applications".
90. Animal Sciences Group, Wageningen UR at Lelystad, Netherlands (Holland); April 2006 "Phytochemicals for Functional Foods and Animal Health".
91. Symposium on "Development of Industrial Materials with High Value from Natural Resources" at Daegu University and Sang-Ju National University, S. Korea; May 2006 "Biochemical Strategies to Design Functional Foods to Manage Human Health"
92. *In vitro* Biology Meeting, Minneapolis, MN, USA; June, 2006 "Advances in Molecular Nutrition: Role of phytochemicals and antioxidant response pathways"
93. University of Londrina, Parana State, Brazil; June, 2006 Food Biotechnology, Lecture series on "Emerging Concepts in Functional Foods and Food Safety".
94. University of Sao Paulo, Brazil; June, 2006 Food Biotechnology, Lecture series on "Emerging Concepts in Functional Foods and Food Safety".
95. Hokkaido University, Sapporo, Japan; International Symposium on Sustainable Development, August, 2006 "Sustainable Food Production: Integration of Emerging Global Food, Health and Environmental Challenges".

96. VI International Congress of Food Safety, Guadalajara, Mexico; Organized by CIATEJ and CONACYT, August, 2006 "Microbial Food Safety Challenges in an Era of Diet-Related Disease Problems and Global Trade".
97. Cheju National University; Jeju Island, South Korea; October 2006; Seminar series on "Recent Advances in Functional Ingredient Design & Applications".
98. Iowa State University, Ames, IA, USA; November 2006: Role of Proline-Linked Redox Pathways for Food, Feed and BioFuel Applications".
99. Indigenous Farming and Food Conference, White Earth, MN, USA; February 2007: "Benefits of Indigenous and Traditional Foods for Human Health".
100. MATFORSK (Norwegian Food Research Center) & UMASS Workshop, Aas, Norway; March 2007: "Global Food Diversity to Combat Diet-Linked Chronic Diseases and Better Health" and "Optimization of Phenolic Antioxidants in Diverse Food Systems for Better Health".
101. Institute of Food Technology, Annual Meeting Chicago, IL; July 2007: "Value-added biochemical strategies in Indian subcontinent diet design for disease prevention" Session: "Foods from the Indian subcontinent that Inherently Promote Wellness and Reduce Disease Risk".
102. Kemin Industries, Inc., Des Moines, IA, USA: August 2007: "Metabolic Biology of Phenolic Phytochemicals from Lamiaceae for Functional Ingredients".
103. Pioneer Valley Life Science Institute, Springfield, MA, USA: September 2007: "Redox Pathways for Diet Design to Manage Type 2 Diabetes".
104. Proline Symposium: Proline Metabolism in Health & Disease, NCI-Frederick, MD, USA: September 2007: "Functional Food Design via Proline-Linked Redox Pathways to Counter Diet-Linked Chronic Disease Challenges".

Grants

Total from 1993-2006 as PI: \$ 878,965

Total as Co-PI from 1993-2006: \$ 2,891,734

Total as PI and Co-PI from 1993-2007: \$ 3,377,699

Editorship

- 1) Editor-in Chief, "Food Biotechnology"- Taylor and Francis, UK/USA

Editorial Boards

- 1) Editorial Board of "Journal of Food Biochemistry"-Blackwell Publishers, USA
- 2) Editorial Board of "Innovative Food Science and Emerging Technologies"-Elsevier
- 3) Editorial Board of "Journal of Food Science & Technology" (AFSTI-India)

4) Inaugural Editorial Board of "Annual Reviews of Food Science and Technology", Annual Reviews Series, CA, USA

Book Editor

Food Biotechnology, 2nd Edition [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL.

Functional Foods and Biotechnology [Shetty, K., Paliyath, G., Pometto, A.L. III and Levin, R.E. (eds)]. CRC Press (Taylor and Francis Co), Boca Raton, FL.