Curriculum Vitae

SHIVENDRA V. SAHI, Ph.D.

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EDUCATION

Ph.D.	North Carolina State University, Raleigh, NC 1992
M.S.	Laurentian University, Sudbury, Canada 1983
M.Sc.	Agra University, Agra, India 1979
B.Sc.	Gorakhpur University, Gorakhpur, India 1975

PROFESSIONAL APPOINTMENTS

2006-	Assistant Director, Applied Research and Technology Program Western Kentucky University (WKU), Bowling Green, KY
2005-	Professor, Department of Biology Western Kentucky University, Bowling Green, KY
2000-2004	Director, Biotechnology Center Western Kentucky University, Bowling Green, KY
2000-2005	Associate Professor, Department of Biology Western Kentucky University, Bowling Green, KY
1998-2000	Assistant Professor, Department of Biology Western Kentucky University, Bowling Green, KY
1994 Summer	Visiting Assistant Professor, Department of Botany & Microbiology Auburn University, Auburn, AL
1992-1997	Assistant Professor, Department of Biology Alabama State University, Montgomery, AL
1989-1991	Research Assistant, Agricultural Biotechnology Research Unit CIBA-Geigy Corporation, Research Triangle Park, NC

HONORS and AWARDS

- 2015 Doctoral Thesis Examiner for Department of Biotechnology, Periyar University, Salem, India.
  - This honor is based upon the expertise in a particular research area by an international university.
- 2014 Associate Editor for the Journal of Plant Physiology & Biochemistry, Elsevier Publishing
  - Based upon scientific accomplishments I was invited to become Associate Editor by Elsevier Publishing.
- 2014 Member of the International Committee for Fifth International Conference on Plants & Environmental Pollution (ICPEP-5), India
  - Based upon my research focus I was nominated by peers to serve in this position.
- 2012 Associate Editor, International Journal of Environmental Science & Technology
  - Based upon my scientific publication I was invited by the Editorial Board members to serve in this position.
- 2010 Outstanding Researcher Award by Third Nanotechnology Symposium: Advances in Nanotechnology and Applications, Louisville, KY.
  - Selected for this honor by peers presented their research in this symposium.

- 2009 Career Professional Award by American Society of Agronomy Southern Branch, Atlanta, GA
  - Selected by the members this society, based upon my research accomplishments over years.
- 2008-2009 University Faculty Award for Research and Creativity, WKU
  - This honor is presented to an outstanding researcher in the university. Only one award is presented per year which carries a cash award and a silver plaque.
- 2008-2009 College of Science and Engineering Faculty Award for Research and Creativity, WKU.
  - This honor is presented to only outstanding researcher by the Dean of the Science College. Only one award is presented per year which carries a cash award.
- 2009 Doctoral Thesis Examiner for Faculty of Science, University of Hong Kong, Hong Kong.
  - This honor is based upon the expertise in a particular research area by an international university.
- 2008 Outstanding Research Paper Award by First Nanotechnology Symposium: Advances in Nanotechnology and Applications, Louisville, KY.
  - Selected for this honor by peers presented their research in this symposium.
- 2008 Doctoral Biochemistry Thesis Examiner for Banaras Hindu University, India.
  - This honor is based upon the expertise in a particular research area by an international university.
- 2008 Editorial Board – Journal of Plant Physiology and Biochemistry (Elsevier Publishing).
  - Based upon scientific publication I was invited to serve in the Editorial Board of this journal
- 2001-2002 College of Science and Engineering Faculty Award for Research and Creativity, WKU
  - This honor is presented to only outstanding researcher by the Dean of Sciences. Only one award is presented per year which carries a cash award.

PATENT

- US Patent No: US 8,257,670 B1 (Sept 4, 2012), Monodisperse Gold Nanoparticles and Facile, Environmentally Favorable Process for their Manufacture.
- US Patent No: US 8,569,063 B1 (Oct. 29, 2013), Green Engineering of Gold Nanoparticles of Desirable Geometries in Plants.
- Inhibition of Viral Entry into Host Cells by Plant Metabolites (pending).

RESEARCH EXPERIENCE

A) Research Interest

- Biogenic Synthesis of Nanoparticles and applications
- Gene expression in response to excess essential nutrients and cross talk between them
- Genetic Transformation of Plants to Improve Quality
- Medicinal Application of Plant Metabolites
- Environmental Management and gene expression in plants in response to pollutants

B) Research Publication (*undergraduate and **graduate students)

71) Shukla, D., S. Krishnamurthy, **S. Sahi.** Microarray analysis of Arabidopsis under gold exposure to identify putative genes involved in the synthesis of gold nanoparticles (AuNPs). Genomics Data 3, 100-102 (2015).

70) Venkatachalam Perumal, Sangeetha Palanivel, Geetha Natesan, **Shivendra V. Sahi**. Phytofabrication of bioactive molecules encapsulated metallic silver nanoparticles from Cucumis sativus L. and its enhanced wound healing potential in rat model. J. Nanomat. 2015, Article ID 753193, 9 pages, (2015). doi:10.1155/2015/753193.

69) Kalaiarasi, K., G. Prasannaraj, **S.V. Sahi**, P. Venkatachalam. Phytofabrication of biomolecule-coated metallic silver nanoparticles using leaf extracts of in vitro raised-bamboo species and its anticancer activity against human PC3 cell lines. Turk. J. Biol. 39, 11 pages (2015). Doi:10.3906/biy-1406-10.

68) Manikandan, R., **S.V. Sahi**, and P. Venkatachalam. Impact assessment of mercury accumulation and biochemical and molecular response of *Mentha arvensis*: A potential hyperaccumulator plant. The Scientific World J. Volume 2015, 10 pages (2015). Doi.org/10.1155/2015/715217

67) Shukla, D., S. Krishnamurthy, **S. Sahi**. Genome Wide Transcriptome Analysis reveals ABA mediated response in Arabidopsis during Gold (AuCl4-) treatment. Frontiers in Plant Sci. 5, 1-14 (2014). Doi:10.3389/fpls.2014.00652
66) Krishnamurthy, S., A. Esterle*, N. Sharma, **S. Sahi**. Yucca-derived synthesis of gold nanomaterial and their catalytic potential. Nanoscale Res. Lett. 9, 627 (2014).
65) Jain, A., B. Sinilal, D. Starnes**, R. Sanagala, S. Krishnamurthy, **S. Sahi**. Role of Fe-responsive genes in bioreduction and transport of ionic gold to roots of *Arabidopsis thaliana* during synthesis of gold nanoparticles. Plant Physiol. Biochem. 84, 189-196 (2014).
64) Athikkattuvalasu, K.S., A. Jain; V. K. Nagarajan; S. Bhaskaran; **S. V. Sahi**, Raghothama, K. G. *Arabidopsis thaliana* mutant *lpsi* reveals impairment in the root responses to local phosphate availability. Plant Physiol. Biochem. 77, 60-72 (2014).
63) Jie, H., J. Peralta-Videa, C. Rico, **S. Sahi**, M. Viveros, J. Bartonjo*, L. Zhao, J. Gardea-Torresdey, Evidence of translocation and physiological impacts of foliar applied CeO_2 nanoparticles on cucumber (*Cucumis sativus*) plants. Environ. Sci. Technol. *48*, 4376–4385 (2014).
62) Majumdar, S., J. Peralta-Videa, S. Bandyopadhyay, H. Castillo-Michel, J. Hernandez-Viezcas, **S. Sahi**, J. Gardea-Torresdey. Exposure of cerium oxide nanoparticles to kidney bean shows disturbance in plant defense mechanism. J. Hazard. Mat. 278:279–287. (2014).
61) Malar, S., R. Manikandan, Paulo J.C. Favas, **S. V. Sahi**, P. Venkatachalam. Effect of lead on phytotoxicity, growth, biochemical alterations and its role on genomic template stability in *Sesbania grandiflora*: A potential plant for phytoremediation. Ecotox. Environ. Safety 108, 249–257 (2014).
60) Malar, S., **Sahi S.**, Paulo JC Favas, Venkatachalam P. Lead heavy metal toxicity induced changes on growth and antioxidative enzymes level in water hyacinths [Eichhornia crassipes (Mart.)]. Botanical Studies 55:54 (2014).
59) Malar, S., **S.V. Sahi**, Favas, P.J.C. and P. Venkatachalam. Mercury heavy-metal-induced physiological changes and genotoxic alterations in water hyacinths [*Eichharnia crassipes* (Mart.)]. Environ. Sci. Pollut. Res. 12 pages (2014). Doi 10.1007/s11356-014-3576-2
58) Kumar, A., R.S. Sengar and **S.V. Sahi**. Acclimation and adaptation of plants to different abiotic stresses. In, Climate Change Effect on Crop Productivity, edited by, RS Sengar and K. Sengar, CRC Press, Boca raton, FL. Pp 329-356 (2014).
57) Jain, A., B. Sinilal, G. Dhandapani, R. Meagher, **S. V. Sahi**. Effects of deficiency and excess of zinc on morphological traits and spatiotemporal regulation of zinc-responsive genes reveal incidence of cross talk between micro- and macronutrients. Environ. Sci. Technol. 47, 5327-5335 (2013).
56) Padmanabhan, P., D. Starnes**, **S.V. Sahi**. Differential responses of Duo grass (*Lolium* x *Festuca*), a phosphorus hyperaccumulator to high phosphorus and poultry manure treatment. Afr. J. Biotechnol. 12, 3191-3195 (2013).
55) Sharma, N and **S. Sahi**. Gold nanoparticle synthesis by plants – controlling nanomaterials shapes and sizes. In, Advances in Nanotechnology & Applications, vol. 4, Eds. H.T. Tran & G.K. Pillai. CENTERA Publication, pp 94-104 (2012).
54) Sharma, N. and **S. Sahi**. Excess Soil Phosphorus – Accelerated P Transfer, Water Quality Deterioration and Sustainable Remediation Strategies. In, Improving Crop Resistance to Abiotic Stress, Wiley-Blackwell, Germany. pp 165-191 (2012).
53) Sharma, Nilesh, **S.V. Sahi**. Enhanced Organic Phosphorus Assimilation Promoting Biomass and Shoot P Hyperaccumulations in Lolium multiflorum Grown under Sterile Conditions. Environ Sci Technol, 45, 10531-10537 (2011).
52) Israr, M., A. Jewell*, D. Kumar, **S.V. Sahi**. Interactive effects of lead, copper, nickel and zinc on growth, metal uptake and antioxidative metabolism of *S. drummondii.* J Hazardous Mat 186, 1520-26, (2011).
51) Badwaik**, V., J. Bartonojo*, J. Evans*, **S. Sahi**, C. Willis*, D. Rajalingham. Completely 'Green' Single-step synthesis of Highly Dispersed, Spherical Gold Nanoparticles of 10-120 nm for applications in Chemistry and Biology. Langmuir 27, 5549-5554, (2011).

50) Padmanabhan, P., **S.V. Sahi**. Suppression subtractive hybridization reveals differential gene expression in sunflower grown in high P. Plant Physiol. Biochem. 49, 584-591 (2011).
49) Adams*, A, S. Kumar, M. Clauson, **S. Sahi**. The effects of Oregano (*Origanum vulgare*) oil on human pathogenic yeasts. Adv Biosci Biotechnol 2, 102-106, (2011).
48) Padmanabhan, P., P. Venkatachalam, **S. V Sahi**. Characterization of up-regulated genes associated with high phosphorus accumulation in cucumber. Physiologia Plant 143, 344-354, (2011).
47) Starnes**, D, A. Jain, **S. Sahi**. *In planta* engineering of gold nanoparticles of desirable geometries by modulating growth conditions: an environment-friendly approach. Environ Sci Technol 44, 7110-15 (2010).
46) Andra**, SS, Datta, R, Sarkar, D, Makris, KC, Mullens, CP, **Sahi, SV**, Bach, SBH. Synthesis of phytochelatins in vetiver grass upon lead exposure in the presence of phosphorus. Plant and Soil 326, 171-185 (2010).
45) Padmanabhan, P., **S. V. Sahi**. Phytoremedial Crops and Current Research (Chapter 22). In, Industrial Crops, Technology and Users, by B. Singh (ed.). CABI, UK, pp 470-486 (2010).
44) Sengar, R.S., R. Chaudhary, R. Sengar, S Gupta, D. Kumar and **S.V. Sahi**. "Sustainable Agriculture–A Call of the Day" (Chapter 21) in Stable Food Production & Sustainable Agriculture: A Challenge Ahead in 21st Century. Studium Press, USA, pp 389-436 (2010).
43) Venkatachalam, P., Srivastava** A., K. Raghothama and **S. V. Sahi**. Genes induced in response to mercury-ion-exposure in heavy metal hyperaccumulator *Sesbania drummondii.* Environ Sci Technol 43, 843-850 (2009)
42) Padmanabhan, P., **S. V. Sahi**. Development of an *Agrobacterium*-mediated genetic transformation method for the legume *Sesbania drummondii* using cotyledonary node explants. Plant Cell Rep 28, 31-40 (2009)
41) Elena Rodríguez, José R. Peralta-Videa, Mohd. Israr, **Shivendra Sahi**, Helvia Pelayo, Blanca Sánchez-Salcido, Jorge L. Gardea-Torresdey. Effect of mercury and gold on growth, nutrient uptake, and anatomical changes in *Chilopsis linearis*. Environ Exp Bot 65, 253-262 (2009)
40) Padmanabhan, P., **S. V. Sahi**. Influence of Phosphorus nutrition on growth and metabolism of Duo grass (*Duo festulolium*). Plant Physiol Biochem 47, 31-36 (2009)
39) Venkatachalam, P., A. Jain, **S. V. Sahi**, K. Raghothama. Molecular cloning and characterization of phosphate (Pi) responsive genes in Gulf ryegrass (*Lolium multiflorum* L.): a Pi hyperaccumulator. Plant Mol Biol 69, 1-21 (2009)
38) Andra SS, Datta R, Sarkar D, Makris KC, Mullens CP, **Sahi SV** and Bach SBH. Induction of Lead-Binding Phytochelatins in Vetiver Grass [*Vetiveria Zizanioides* (L.)]. J. Environ. Qual., *38*, 868-877 (2009).
37) Starnes*, D., Priya P, and **S. V. Sahi**. Effect of P sources on growth, P accumulation and activities of phytase and acid phosphatases in two cultivars of annual ryegrass (*Lolium multiflorum* L.) Plant Physiol. Biochem. 46, 580-589 (2008).
36) Israr, M., **S.V. Sahi**. Promising role of plant hormones in translocation of lead in *Sesbania drummondii* shoots. Environ. Pollut. 153, 29-36 (2008).
35) Sharma, N., **S. V. Sahi**, S. Nath, J. Parsons, J. Gardea-Torresdey and T. Pal. Synthesis of plant-mediated gold nanoparticles and catalytic role of biomatrix-embedded nanomaterials. Environ. Sci. Technol. 41, 5137-5142 (2007).
34) Srivastava** A., P. Venkatachalam, K. Raghothama and **S. V. Sahi**. Identification of lead-regulated genes by suppression subtractive hybridization (SSH) in the heavy metal accumulator plant *Sesbania drummondii.* Planta 225, 1353-1365 (2007).
33) Singh, S.R., V. Dennis, C. Carter, S. Pillai, A. Jeffereson, **S.V. Sahi**, E. Moore. Immunogenicity and efficacy of recombinant RSV-F vaccine in a mouse model. Vaccine 25, 6211-6223 (2007).
32) **Sahi, S.V.,** M. Israr, A. Srivastava**, J. Gardea-Torresdey, J. Parsons. Accumulation, speciation and cellular localization of copper in *Sesbania drummondii*. Chemosphere 67, 2257-2266 (2007).
31) Sharma, N., D. Starnes*, **S. V. Sahi**. Phytoextraction of excess soil phosphorus. Environ. Pollut. 146, 120-127 (2007).
30) Jain, A., M. Vasconcelos, K. Raghothama, **S. V. Sahi**. Molecular mechanisms of plant adaptation to phosphate deficiency. Plant Breeding Rev. 29, 359-419 (2007).

29) de la Rosa, G., J.R. Peralta-Videa, G. Cruz-Jimenez, M. Duarte-Gardea, A. Martinez-Martinez, I. Cano-Aguilera, N.C. Sharma, **S.V. Sahi**, J.L. Gardea-Torresdey. Role of Ethylenediaminetetraacetic acid on lead uptake and translocation by Tumbleweed (*Salsola kali*). Environ. Toxicol. Chem. 26, 1033-1039 (2007).
28) Ruley**, A.T., N. C. Sharma, **S. V. Sahi**, S. R. Singh, K. S. Sajwan. Effects of lead and chelators on growth, photosynthetic activity and Pb uptake in *Sesbania drummondii.* Environ. Pollut. 144, 11-14 (2006).
27) Israr, M. and **S.V. Sahi**. Antioxidative responses to mercury in the cell cultures of *Sesbania drummondii*. Plant Physiol. Biochem. 44, 590-595 (2006)
26) Israr, M., **S.V. Sahi**, D. Sarkar, R. Datta. Bioaccumulation and physiological effects of mercury in *Sesbania drummondii.* Chemosphere 65, 591-598 **(**2006)
25) Sajwan, K.S., S. Paramasivam, A.K. Alva, and **S. V. Sahi**. Fly Ash-Organic Byproduct Mixture as Soil Amendment. *In* Viable Methods of Soil and Water Pollution Monitoring, Protection and Remediation. In Irena Twardowska, Herbert E. Allen and Max H. Haggblom, NATO Science Series, Springer Publishers, Netherlands, pp 387-399 (2006).
24) Sharma, N. C. and **S. V. Sahi**. Physiology of lead accumulation and tolerance in a lead accumulating plant (*S. drummondii*), In: Trace Elements in the Environment: Biogeochemistry, Biotechnology and Bioremediation, eds. M.N.V. Prasad, R. Naidu, K. Sajwan, CRC Press, Boca Raton, FL. pp 425-438 (2006)
23) Sharma, N.C. and **S. V. Sahi**. Characterization of phosphate accumulation in *Lolium multiflorum* for remediation of phosphorus-enriched soils. Environ. Sci. Technol. 39, 5475-5480 (2005).
22) Sharma, N., **S. Sahi**, J. Jain. *Sesbania drummondii* cell cultures: ICP-MS determination of the accumulation of Pb and Cu. Microchem. J. 81, 163-169 (2005)
21) Ruley**, A. T., N. C. Sharma, **S. V. Sahi**. Antioxidant defense in a lead accumulating plant, *Sesbania drummondii*. Plant Physiol. Biochem. 42, 899-906 (2004)
20) Cheepala**, S., N. Sharma, **S.V. Sahi**. Rapid *in vitro* regeneration of *Sesbania drummondii*. Biol. Plant. 48(1): 13-18 (2004)
19) Sharma, N. C., **S. V. Sahi**, J. C. Jain, K. G. Raghothama. Enhanced accumulation of phosphate by *Lolium multiflorum* cultivars grown in phosphate-enriched medium. Environ. Sci. Technol. 38, 2443-2448 (2004)
18) Sharma, N. C., J. L. Gardea-Torresdey, J. Parsons, **S. V. Sahi**. Chemical speciation and cellular deposition of lead in *Sesbania drummondii*. Environ. Toxicol. Chem. 23(9), 134-139 (2004)
17) **Sahi, S.V.**, N.C. Sharma. Phytoremediation of Lead. Trace and Ultra-trace Elements in Plants and Soil. Ed. I. Shtangeeva – Advances in Ecological Sciences Series, WIT Press, UK, 209-222 (2004)
16) Ruley**, A. T., N. C. Sharma, **S. V. Sahi**. Transport and sequestration of lead by *Sesbania drummondii*. Proc. 7th International conference on the biogeochemistry of trace elements. editors: G. R. Gobran and N. Lepp, 1(I), 194-195 (2003).
15) Mohamalawari**, D., N. Sharma, P. Cristae, **S. V. Sahi**. Transformation of maize by 2,4-dihydroxy-7-methoxy-2H-1,4-benzoxazine-3(4H)-one resistant *Agrobacterium* strains. Biotechnol. Lett. 24, 197-203 (2002).
14) Boswell*, C., N.C. Sharma, **S. V. Sahi**. Copper-tolerance and–accumulation potential of *Chlamydomonas reinhardtii*. Bull. Environ. Contam. Toxicol. 69 (4), 546-553 (2002).
13) **S. V Sahi**, N. Bryant*, S. R. Singh and N. Sharma. Characterization of a lead hyperaccumulator shrub, *Sesbania drummondii*. Environ. Sci. Technol. 36, 4676-4680 (2002)
12) Sharma, N.C, J. Jain, **S. V. Sahi**. Evaluation of phosphate phytoremediation potential of ryegrass (*Lolium multiflorum*). Proc. 2nd International Congress on Balancing Food and Environmental Security - A continuing challenge, New Delhi, 2, 1009-1010 **(**2002).
11) Barlow, R**., N. Bryant*, J. Andersland and **S. V. Sahi**. Lead Hyperaccumulation be *Sesbania drummondii*. Proc. of the 2000 Conference on Hazardous Waste Research 112-114 (2001)
10) Fowler, R., L. Breeding*, J. Ovesen*, C. Groves, **S. V. Sahi**. A DNA fingerprinting technique to survey microbial diversity in caves. Proc. 15th Annual National Cave and Karst Management Symposium, Tucson. AZ 131-137 (2001)

9) Hutchinson, M.J., T. Senaratana, **S. V. Sahi** and P. K. Saxena. Light mediates endogenous plant growth substances in thidiazuron-induced somatic embryogenesis in geranium hypocotyl cultures. J. Plant Biochem. Biotechnol. 9, 1-6 (2000)
8) **Sahi, S. V**., V. Faison**, Natalie L. Bryant* and John Andersland. Accumulation of heavy metals by *Sesbania* species. Proc. 5th International Conference on the Biogeochemistry of Trace Elements. editors: W.W. Wenzel, D.C. Adriano, B. Alloway, H.E. Doner, C. Keller, N.W. Lepp, M. Mench, R. Naidu and G.M. Pierzynski. Vol. I, pp 582-583 (1999)
7) Chang, C.-C., R.D. Locy, R. Smeda, **S.V. Sahi** and N.K. Singh. Photoautotrophic tobacco cells adapted to grow at high salinity. Plant Cell Rep. 16, 495-502 (1997)
6) Faison**, V., **S. V. Sahi**, K. Manuel, S. Pavlostathis. Uptake of copper metal by *Crotalaria* sp. (Rattle Box). WERC/HSRC-97 Proceedings of Joint Conference on Environment, Albuquerque, NM, pp 519-523 (1997)
5) **Sahi, S. V.**, C.E. Anderson and W.S. Chilton. The corn wound metabolite DIMBOA causes cell death in tobacco and corn. Plant Sci. 108, 31-40 (1995)
4) **Sahi, S. V.**, R. Gagliardo, M.-D. Chilton, W.S. Chilton. A thin layer chromatographic technique for detecting inducers of *Agrobacterium* virulence genes in corn, wheat and rye. Plant Cell Rep 13, 489-492 (1994)
3) **Sahi, S.V.**, Mary-Del Chilton, W. Scott Chilton. Corn metabolites affect growth and virulence of *Agrobacterium tumefaciens*. Proc. Natl. Acad. Sci. USA 87, 3879-3883 (1990)
2) **Sahi, S.V.**, M.-D. Chilton and W.S. Chilton. Metabolites in maize which affect virulence induction of *Agrobacterium tumefaciens*. Plant Physiol. 89(4), 86 (1989)
1) **Sahi, S.V.,** P.K. Saxena, G.D. Abrams, J. King. Identification of the biochemical lesion in a pantothenic requiring auxotroph of *Datura innoxia* P. Mill. J. Plant Physiol. 133, 277-280 (1988)

C) <u>Research Presentation</u> (only listed since 2005) (>100 during 1989-2012) (*undergraduate and **graduate students)

43) Fleischman*, P., N. Sharma, <u>S. Sahi</u>. Effect of titanium dioxide nanoparticles on growth, photosynthetic efficiency and oxidative stress on food crops. American Society of Plant Biologist (Mid-Western Section) annual Conference, St. Louis, MO, March 2015.
42) <u>Sahi, S</u>., A sustainable eco-friendly approach for *in planta* green engineering of gold nanoparticles. International Conference on Recent Advances in Nanoscience and nanotechnology 2014, New Delhi, India, December 2014.
41) <u>Sahi, S</u>., B. Sinilal, A. Jain, D. Starnes**. Phytotechnology for Synthesis of Nanoparticles. 10th International Phytotechnology Conference, Syracuse, NY, Oct 2013.
40) Chandra, P**., N. Sharma, B. Sinilal, <u>S. Sahi</u>. Bioaccumulation and effects of gold nanoparticles after their prolonged administration in mice. 5th Nanotechnology and Nanomedicine Symposium, Sullivan University, Louisville, KY Sept 2012.
39) <u>Sahi S</u>, Jain A, Starnes D, Bhaskaran S. In planta synthesis of gold nanoparticles. International Conference on Plant Biotechnology for Food Security: New Frontiers. IARI, New Delhi, Feb 2012.
38) Sinilal B1, Ajay Jain2 and <u>Shivendra V Sahi</u>. In planta synthesis of gold nanoparticle: deciphering piggy back molecular transport mechanism and use of suspension cell cultures for scaling up the production. 4th Nanotechnology Symposium, Louisville, KY Sept 2011.
37) Jain, A., D. Starnes**, <u>S. Sahi</u>. Molecular responses during *in planta* synthesis of gold nanoparticles. 3rd Annual Nanotechnology Symposium, Louisville, KY. September 2010.
36) <u>Sahi, S</u>. Can crops be used for synthesis and engineering of variable shapes and sizes of nanoparticles? International Conference on Food & Agricultural Applications of Nanotechnologies (NanoAgri2010), Sao Pedro, Brazil. June 2010.
35) Kancharla, J.**, A. Jain, <u>S. Sahi</u>. Generation of transgenic *Medicago* overexpressing "*osmotin-chitinase*" gene chimera for conferring resistance towards stresses. Annual Meeting of Southern Association of Agricultural Scientists (American Society of Agronomy Southern Branch Meeting), Orlando, FL, February 2010.

34) Starnes, D**.A. Jain, S. Sahi. *In planta* "Green Engineering" of variable sizes and exotic shapes of Gold Nanoparticles: An integrative eco-friendly approach. Annual Meeting of Southern Association of Agricultural Scientists (American Society of Agronomy Southern Branch Meeting), Orlando, FL, February 2010.
33) Padmanabhan, P., K. Raghothama, S. Sahi. Identification of phosphate (Pi)-responsive genes in cucumber by suppression subtractive hybridization. Annual Meeting of American Society of Plant Biologists, Honolulu, HI, July 2009.
32) Mink, Jared*, Priya Padmanabhan, Shivendra Sahi. Transformation of *Medicago sativa* with *Agrobacteria* to Create Insecticidal Plants. 39th Annual Student Research Conference, Bowling Green, KY, February 2009
31) Starnes**, D., Sahi, S. Plants can produce Nanoparticles. 39th Annual Student Research Conference, Bowling Green, KY, February 2009
30) Shivendra Sahi, Daniel Starnes**. Nanoparticle synthesis in alfalfa. Annual Meeting of Southern Association of Agricultural Scientists (American Society of Agronomy Southern Branch Meeting), Atlanta, GA, February 2009.
29) Shivendra Sahi, Pradyut Paul**, Kenneth Sajwan. Assimilation of organic phosphorus in *Lolium multiflorum*. Annual Meeting of Southern Association of Agricultural Scientists (American Society of Agronomy Southern Branch Meeting), Atlanta, GA, February 2009.
28) Padmanabhan, P., K. Raghothama, S.V. Sahi. Isolation of phosphate (pi)-regulated genes in sunflower by suppression subtractive hybridization. Joint Annual Meeting of American Society of Agronomy. Houston, October 2008
27) Starnes, D**, S.V. Sahi. Plants can produce nanoparticles. Nanotechnology Symposium: Advances in Nanotechnology and Applications, Louisville, KY, October 2008.
26) Venkatachalam, P., P. Padmanabhan, K. Raghothama, S. Sahi. Identification and characterization of phosphate (Pi) responsive genes in gulf ryegrass (*Lolium multiflorum* L.) by suppression subtractive hybridization. Annual Meeting of American Society of Plant Biologists, Merida, Mexico. June 2008.
25) Sahi, S.V., J. Gardea-Torresdey, T. Pal. Plant-mediated synthesis of gold nanoparticles and their catalytic functions. nanoEco, Nanoparticles in the Environment: Implications and Applications, Ascona, Switzerland, March 2008.
24) Starnes, D., S. V. Sahi. Phytomining of gold and plant-mediated production of gold nanoparticles. KY Nanomat 2008, Louisville, KY, March 2008.
23) Padmanabhan, P., K. Sajwan, S. Sahi. Phosphorus acquisition by Duo grass (*Duo festulolium*) is enhanced in the presence of various P-sources in the growth media. Annual meeting of American Society of Agronomy (Southern Branch). Dallas, February 2008.
22) Patel, M., R. Datta, P. Punamiya, D. Sarkar, S. Sahi. Antioxidative response and arsenic localization in the arsenic-hyperaccumulator Chinese Brake Fern (*Pteris vittata* L.). Annual meeting of American Society of Agronomy (Southern Branch). Dallas, February 2008.
21) Patel, M., R. Datta, P. Punamiya, D. Sarkar, M. Israr, S. Sahi. Arsenic distribution and localization in the fronds of hyperaccumulator fern *Pteris vittata*. Annual meeting of American Society of Agronomy. New Orleans, November 2007.
20) Sahi, S., M. Israr. Phytoremediation, a novel method for removal of heavy metals from environment: biochemical and molecular mechanisms. Sudbury 2007: An International Conference, Mining and the Environment, Sudbury, Canada, October 2007.
19) Adams, A*, M. Israr, M. Clauson, S. Sahi. Antifungal activity of oregano (*Origanum vulgare*) oil against human pathogenic fungi. Annual meeting of American Society of Plant Biologists, Chicago, July 2007.
18) Hajara, M**, H. Johnson, L. Alice, S. Sahi. Conversion of traditional taxonomy-centered botany lab to case-based inquiry learning. Annual meeting of American Society of Plant Biologists, Chicago, July 2007.
17) Israr, M., A. Jewell*, S. Sahi. Combined effects of different heavy metals: lead, copper, nicket and zinc upon *Sesbania drummondii* metal accumulation and antioxidative system. Annual meeting of American Society of Plant Biologists, Chicago, July 2007.

16) Sahi, S., M. Israr, K. Sajwan. Enhanced lead accumulation in *Sesbania* shoots by plant growth regulators. ICOBTE, Beijing, China, July 2007.
15) Sahi, S., D. Starnes*, P. Paul**, P. Padmanabhan, N. Sharma, K. Sajwan. Can crops be used to remediate excess phosphorus? Southern Association of Agricultural Scientists, February, 2007.
14) Sahi, S., M. Israr, K. Sajwan. Influence of chelators on bioaccumulation of plants. Complexing agents between science, industry, authorities and users Conference, Monte Verita, Ascona, Switzerland, March 2007.
13) Israr, M. J. Gardea-Torresdey, S.V. Sahi**.** Chromium accumulation and its influence on growth and anti-oxidative system of *Sesbania drummondii*. American Chemical Society Annual meeting, Chicago, March 2007
12) Adams*, A., M. Israr, S. Sahi**.** Assessment of fungicidal potential of Oregano against pathogenic fungi, KHRT Conference, Bowling Green, KY. March 2007.
11) Srivastava**, A., Venkatachalam, P., K. Raghothama, S. Sahi. Identification and characterization of lead responsive genes in *Sesbania drummondii* by suppression subtractive hybridization. American Society of Plant Biologist Annual Meeting, Boston, MA, August 2006.
10) Paul**, P., N. Sharma, S. Sahi, J. Albano. Evaluation of organic phosphorus assimilation in *Lolium multiflorum* and *Duo festulolium*. American Society of Plant Biologist Annual Meeting, Boston, MA, August 2006.
9) Albano, J., S. Sahi, C. Wilson, K. Bowman. Abiotic factors possibly contributing to reset failure of citrus trees in the commercial grove in Florida. HortScience Conference, New Orleans, March 2006.
8) Srivastava**, A. and S.V. Sahi. Screening of Genes Expressed in Response to Lead in *Sesbania drummondii*. Kentucky Academy of Science, Richmond, KY, Nov 2005.
7) Starnes*, D., N. Sharma and S.V. Sahi. Use of *Duo festulolium* in the remediation of phosphorus-enriched soils. American Society of Agronomy (south branch), Orlando, FL, Feb 2006
6) Quintero*, R., M. Israr and S.V. Sahi. Effect of plant growth hormones and EDTA on lead uptake in *Sesbania drummondii*. American Society of Agronomy (south branch), Orlando, FL, Feb 2006.
5) Srivastava**, A. M. Israr and S.V. Sahi. Growth and copper accumulation in Sesbania drummondii exposed to high concentrations of copper. American Society of Agronomy (south branch), Orlando, FL, Feb 2006.
4) Starnes*, D. L., N. C. Sharma and S. V. Sahi. Use of *Lolium multiflorum* in the remediation of chicken litter-contaminated media. Annual meeting of American Society of Agronomy (Southern Branch), San Antonio, TX, June 2005.
3) Israr, M. and S. V. Sahi. Growth. Metal accumulation and antioxidative responses in *Sesbania drummondii* exposed to mercury. Annual meeting of American Society of Agronomy (Southern Branch), San Antonio, TX, June 2005.
2) Srivastava**, A. K. and S. V. Sahi. Callus culture of *Sesbania drummondii*: A medicinally and environmentally important plant. Annual meeting of American Society of Agronomy (Southern Branch), San Antonio, TX, June 2005.
1) Sahi, S., A. T. Ruley**, N. C. Sharma, S. R. Singh, K. S. Sajwan. Effects of lead and chelators on growth, photosynthetic activity and Pb uptake in *Sesbania drummondii.* 8th ICOBTE Meeting, Adelaide, Australia, April 2005.

D) Award for Student's Research (*undergraduate and **graduate students)**

1) Kancharla, J.**, A. Jain, S. Sahi. Generation of transgenic *Medicago* overexpressing "*osmotin-chitinase*" gene chimera for conferring resistance towards stresses. Annual Meeting of Southern Association of Agricultural Scientists, Orlando, FL, Feb 2010 **(2nd place award for oral presentation)**
2) D. Starnes**, S.V. Sahi. Plants can produce nanoparticles. Nanotechnology Symposium: Advances in Nanotechnology and Applications. Louisville, KY, October 2008 **(Outstanding Research Paper Award**).

3) Starnes, D**., Sahi, S. Phytomining of gold and plant-mediated production of gold nanoparticles. Kentucky Academy of Science, Lexington, KY, Oct 2008 **(1st place award in Agricultural Sciences division competition)**
4) D. Starnes**, S. Sahi. Biological synthesis of gold nanoparticles, 2008 WKU Student Research Conference, April 2008 **(Best Graduate Student Presentation Award**)
5) K. Pollard*, R. Fowler, S. Sahi. Application of DNA technology to monitor phytoplankton in the Green River. HBCU-UP National Research Conference, Baltimore, MD, Feb 2006. (**1st Place award in Environmental Science Poster Presentation)**
6) Srivastava**, A., M. Israr, S.V. Sahi. Growth and copper accumulation in *Sesbania drummondii* exposed to high concentrations of copper. American Society of Agronomy (south branch), Orlando, FL, Feb 2006 **(2nd place award in student oral competition)**
7) Srivastava**, A. and S.V. Sahi. Screening of Gene Expressed in Response to Lead in *Sesbania drummondii*. Kentucky Academy of Science, Richmond, KY, Nov 2005 **(1st place award in Cell and Molecular biology division competition)**
8) Roberson*, E., R. Fowler, S. V. Sahi. Development of a rapid quantitative real-time PCR method to detect total environmental fungi. 89th Annual Meeting of Kentucky Academy of Science, Bowling Green, KY, November 2003. **(1st place award in student oral competition)**
9) Ruley, A.T.**, N.C. Sharma, S.V. Sahi. Oxidative stress studies in lead hyperaccumulator shrub (*Sesbania drummondii*). 100th Annual Meeting of American Society of Agronomy (southern branch), Mobile, AL, February 2-4, 2003. **(2nd Place award in Graduate Student's oral presentation competition)**
10) J. Ovesen*, L. Breeding*, S.V. Sahi, R. Fowler. Characterization of bacteria from cave sediments by DNA sequencing and fragment analysis of 16S rRNA genes. Joint Annual Meeting of Kentucky/Tennessee Academy of Science, Murfreesboro, TN, November 2001. (**First place award in student oral competition in Botany & Microbiology section**).
11) L. Breeding*, J. Ovesen*, S.V. Sahi, R. Fowler. Identification of bacteria in Mammoth Cave sediments by molecular cloning and DNA sequencing. Joint Annual Meeting of Kentucky/Tennessee Academy of Science, Murfreesboro, TN, November 2001. (**2nd place award in student poster competition**).
12) R. Fowler, L. Breeding*, C. Groves, and S.V. Sahi. Analysis of rRNA Gene Sequences to Study Diversity of Microorganisms in Mammoth Cave. Annual Convention of the National Speleological Society, Great Saltpeter Cave Preserve, Mt. Vernon, KY, July 2001. (**"Certificate of Excellence" Award for this research**).
13) D. Mohamalawari** and S.V. Sahi. Genetic Transformation of Corn and Tobacco by *Agrobacterium tumefaciens*. Annual meeting of American Association of Agronomy (Southern Branch). Fort Worth, TX, January, 2001 **(First Place award in Graduate Student's oral presentation competition)**
14) C. Anderson**, D. Mohamalawari* and S.V. Sahi. Expression of beta-glucuronidase in corn and tobacco by *Agrobacterium*-mediated gene transfer. 2000 Sigma Xi Student Research Conference, WKU, April 2000 **(Winner of Graduate Oral Presentation Competition).**
15) N. Bryant*, R. Barlow**, J. Andersland, J. Jain, S. Sahi. The uptake and translocation of lead by *Sesbania drummondii*. The 85th Annual Meeting of Kentucky Academy of Science, Richmond, KY, November 1999 **(First place award in the undergraduate poster competition)**.
16) V. Faison**, S. V. Sahi, K. Manuel and S. Pavlostathis. Uptake of copper metal by *Crotalaria* sp. (Rattle Box). Proceedings of WERC/HSRC-97 Joint Conference on the Environment, Albuquerque, NM 1997. **(Special Recognition Award)**.

E) Grant Proposal

i) Funded Grants

1) National Science Foundation - In Planta Synthesis of Gold Nanoparticles: An Integrative Eco-friendly "Green Engineering". $375,402 (2012-2016), PI.
2) Western Kentucky University RCAP I: Toxicological Evaluation of Biologically-Synthesized Gold Nanoparticles. $16,000 (2014-15), PI.

3) US Department of Agriculture – Biotechnological strategies to improve phosphate acquisition to reduce environmental contamination by poultry litter. $1,692,780 (2001-2016).
4) National Science Foundation: MRI: Acquisition of an Analytical Transmission Electron Microscope with Cryogenic Imaging Capabilities for Undergraduate Research and Training. $425,000 (2013-16), Co-PI.
5) National Science Foundation: S STEM: Recruitment and retention of students in biotechnology-associated majors. $616,669 (2013-18), Co-PI.
6) National Science Foundation-Research Experiences for Undergraduates (REU) – Summer Research Experiences in Investigative Biotechnology. $340,543 (2010-2013), PI.
7) WKU-Research & Creative Activities Program: Plant-mediated synthesis of nanoparticles, $16,000 (2012-2013), PI.
8) Kentucky Science and Technology, Commercialization Fund – Development of anti-viral therapeutic agent from plant metabolites. $225,000 (2006-10), PI.
9) Kentucky Tobacco Research and Development Center – Inhibition of Herpes Simplex Virus by Plant Extract. $59,991 (2005-06), PI.
10) WKU, Applied Research & Technology Program – Extract from plant can inhibit HSV infectivity. $40,000 (2004-05), PI.
11) National Science Foundation – REU: Summer Research Experience in the Mammoth Cave/Upper Green River Watershed. $253,556 (2003-06), co-PI.
12) National Science Foundation (KY-EPSCoR) – Bioengineering of *Sesbania drummondii* for efficient phytoremediation $33,556 (2003-04), PI.
13) Western Kentucky University–Renovation of Biology Department Greenhouse proposal. $17,000 (2001), PI.
14) FLAD/NSF's International Bioethics Institute – Proposal for Participation in the Bioethics Institute in Lisbon, Portugal. $1,950 (2001), PI.
15) US Department of Agriculture - Transformation of corn using DIMBOA-resistance *Agrobacterium*. $50,073 (1997-2000), PI.
16) US Environmental Protection Agency – Application of Biotechnology in Bioremediation of Contaminated Sediments. $82,750 (1995-1997), PI.
17) US Department of Agriculture Forest Service – The Evaluation of Agrobacterium Infection and Gene Expression in *Pinus taeda* and *P. helepensis*, $ 52,000 (1995-97), PI.
18) National Institute of Health – Gene (Artificial Storage Protein-1) Transfer in Maize by *Agrobacterium tumefaciens* to Improve Nutritional Quality. $130,878 (1994-96), PI.

ii) Pending Grant

None.

iii) Non-funded Grants (in last 12 years)

1) 1) National Science Foundation – Deciphering Molecular Mechanism Underlying in Planta Synthesis of Gold Nanoparticles of Desired Properties. $ 532,218 (2014) PI.
2) National science Foundation - MRI: Acquisition of a Laser Scanning Confocal Microscope for Research and Instruction at a Primarily Undergraduate Institution. $375,270 (2015) Co-PI.
3) Environmental Protection Agency: Comparative Genomics of Lichen to Identify Molecular Markers for Assessment of Environmental Pollution $179,358 (2014), co-PI.
4) National Science Foundation: MRI: Acquisition of a Confocal Laser Scanning Microscope for Research and Instruction $378,132 (2013-2016), Co-PI.
5) National Science Foundation-KY EPSCoR: Biofabrication of Nano-Gold: Risk Evaluation using a Mouse Model of Inflammation $25,000 (2013-14), Co-PI.
6) Arnold and Mabel Beckman Foundation: WKU Beckman Scholars Program in Biotechnology and Materials. $96,500 (2014-17), Co-PI.
7) KY NSF-EPSCOR - Toxicological Evaluation of Biologically-Synthesized Gold Nanoparticles. $24,890 (2013), co-PI.

8) Arnold and Mabel Beckman Foundation - 2012 Beckman Scholars Program. $96,500 (2011), co-PI.
9) National Science Foundation-Undergraduate Research Mentoring in Biological Sciences - URM: Resources, Opportunities, and Programming for Excelling Scholastically (ROPES) in the Biological Sciences. $999,557 (2010), PI.
10) National Research Foundation-IDR: Three-prong approach to "green engineer" in planta synthesis of nanogold particles: mechanism, tissue-specificity, and isolation of biomatrix-embedded particles. $598,738 (2010), PI.
11) Kentucky Tobacco Research & Development Center, In Planta Synthesis of Variable Shapes and Sizes of Gold Nanoparticles: An Integrative Eco-Friendly 'Green Engineering' Approach. $27,513 (2010), PI.
12) National Science Foundation – Developing a pipeline to increase the number of underrepresented students entering in graduate studies in biology $969,909 (2007 and 2008), PI.
13) US Department of Agriculture (Higher Education Challenge Grant) – Interdisciplinary Biotechnology Curricula. $286,787 (2005), co-PI.
14) National Science Foundation (NIRT) – Bioreduction and biocrystallization of metal nanoparticles using living plants and biomaterials derived from plants. $1,537,582 (co-PI) (2005).
15) National Park Service – Micropropagation of American Chestnut. $ 112,207 (2004).
16) National Science Foundation (KY-EPSCoR) – Synthesis of Gold Nanoparticles using Plant Tissues. $ 32,652 (2004).
17) National Science Foundation – Synthesis and Recovery of Noble Metal Particles using Plant Tissues. $ 1,701,905 (Co-PI) (2003).
18) National Health Institute (KBRIN Program) – Development of an edible vaccine against Respiratory Syncytial Virus. $ 104,225 (2003).
19) National Science Foundation – Production of Noble Metal Nanoparticles Using Biological Systems. $1,633,618 (Co-PI) (2002).
20) National Science Foundation - Research Enhancement for Undergraduate Students. $211,821 (Co-PI) (2002).
21) National Science Foundation – Role of Bacteria in Karst Aquifer Evolution: A Mammoth Cave Microbial Observatory. $628,810 (PI) (2002).
22) KBRIN Program of National Institute of Health – Cell culture of *Sesbania* for production of antitumor, immunosuppressive and CNS depressive compounds (PI) (2002).
23) National Science Foundation – Development of molecular genetic assays for forest soil microbial biodiversity at Mammoth Cave National Park. $40,625 (Co-PI) (2002).
24) Mammoth Cave National Park – Instrument for research and development of quantitative PCR assays for biological monitoring at Mammoth Cave National Park. $58,495 (Co-PI) (2002)
25) National Science Foundation – Research Enhancement for Undergraduate Students. $211,821 (Co-PI) (2001)
26) National Science Foundation (Nanoscale: Interdisciplinary Research) – Bioprocess to produce noble metal nanostructures. $1,610,118 (Co-PI) (2001)
27) Kentucky Science & Engineering Foundation – Removal of toxic metals from wastewater by non-living biomass of *Sesbania*. $157,632 (2001)
28) Kentucky Science & Engineering Foundation – Analysis of molecular biomarkers to survey for bacteria that promote limestone dissolution on cave and kart aquifers. $199,998 (Co-PI) (2001).
27) National Science Foundation – Microbial Basis for Karst Aquifer Evolution and Its Societal Impact. $298,540 (2001)
29) National Science Foundation (EPSCoR) – Analysis of rRNA Gene Sequences to Study Diversity of Microorganisms in Sediments from Mammoth Cave and Potential Impacts on Aquifer Evolution. $23,175 (2001)
30) US Environmental Protection Agency – Removal of Toxic Contaminants from Wastewater by Plants. $500,000 (Co-PI) (2001)

31) National Science Foundation (Nanoscale: Interdisciplinary Research) – Bioprocess to Produce Novel Au, Pt and Ag Nanostructures: Mechanism(s) and Characterization. $1,689,907 (Co-PI) (2000)

F) Grant Reviewer

- National Science Foundation (panelist and ad-hoc reviewer)
- US Department of Agriculture (panelist)
- Environmental Protection Agency (panelist)
- US Army – ERDC Program
- US Army Engineer Research and Development Center - SERDP Program
- Southwest Center for Environmental Research & Policy – Applied Border Environ Research Program
- KY SBIR Phase Zero Review Committee
- KY EPSCoR - Collaborative Research Development Program
- KY EPSCoR - Research Startup Fund
- KY Tobacco Research and Development Center Grant
- Charles A. and Anne Morrow Lindbergh Foundation Grant
- Czech Scientific Foundation
- University of Texas at El Paso for NIH Score Program

G) Manuscript Reviewer

Nature Nanotechnology, Environmental Science and Technology, Planta, In Vitro Cellular & Developmental Biology-Plant, Biotechnology Progress, Proceeding of Indian Academy of Science, Plant Physiology and Biochemistry, Scienticia Hort, Journal of Hazardous Substance Research, Bioresource Technology, Plant Science, Environmental Pollution, Chemosphere, Coordination Chemistry Reviews, Canadian Journal of Plant Science, etc.

H) Research Supervision

Research Associates (Post-doctoral Fellow)

1) Dr. N. Sharma, Ph.D. (2001-2005) (currently Biology faculty at WKU)
2) Dr. M. Israr, Ph.D. (2004-2007) (currently research staff, Penn State College of Medicine)
3) Dr. P. Padmanabhan, Ph.D. (2006-2009) (currently research staff, University of Guelph, Canada)
4) Dr. S. Kumar, Ph.D. (2009) (currently Research Scientist at ICAR Lab in India)
5) Dr. A. Jain, Ph.D. (2009-10) (currently Research Scientist at IARI Lab in Delhi, India)
6) Dr. B. Sinilal, Ph.D. (2010-13) (currently an Assistant Professor in a College in India)
7) Dr. S. Krishnamurthy, Ph.D. (2012-2014) (currently an Instructor at WKU)
8) Dr. D. Shukla, Ph.D. (2013-)
9) Dr. M. Tiwari, Ph.D. (2014-)

Visiting Scientists

1) Dr. A. Jain, Research Scientist IARI, India (summer 2011, 2012 and 2013).
2) Dr. P. Dantu, Associate Professor, Dayalbagh Educational Institute, Agra, India (summer 2012).

Technician

1) Margaret Mahan (2009-2012)

Graduate Students

V. Faison, MS (MD Internal Medicine), currently practicing Physician in Durham, NC; C. Anderson, currently Research Assistant, UAB Medical College, Birmingham, AL; D. Mohamalawari, currently Research Assistant, Johns Hopkins Medical School, Baltimore; S. Cheepala (PhD), currently Research Associate at St. Jude Hospital in Memphis, TN; T. Ruley, MS (MD), currently Resident Physician in Columbus, OH; A. Srivastava,

(PhD), currently post-doctoral fellow at National Institute of Health, Bethesda, MD; D. Starnes (Ph.D. student at University of Kentucky, Lexington, KY); J. Kancharla (MS); Jane Bartonjo, BS (currently in MS Biology Program)

Undergraduate Students

Sean Wineka, Ajit Deshpande, Paul Fleischmann, Jeet Parekh, BS, Andrea Esterly, BS, S. Stallworth, BS (REU: Summer Intern), J. Minks, BS(currently grad student), N. Serroque (BS), J. Burbage, A. Jewell, BS (REU: Summer Intern), J. Strains, A. Adams (in Pharmacy Program at Auburn University), A. Small (BS), E. Roberson (Research Associate at Washington University, St. Louis), N. Bryant, BS (Physician Assistant in Bowling Green, KY), C. Boswell, BS (Kentucky State Environmental Division), M. Honaker, BS (in Ph.D. program at Washington State University, M. Mayfield (BS), L. Breeding (BS), J. Bunch (in MD program at University of Louisville Medical Center, Louisville, KY), J. Ovesen (in Ph.D. program at University of Cincinnati), J. Schrimsher (in MD program at Thomas Jefferson Medical School, Philadelphia, PA), N. Woolen (BS), S. Whiteledge (BS), D. Starnes (in PhD program at UK), R. Quintero, (in MS program at Austin Pea, TN), C. Cross (REU: Summer Intern), K. Pollard (REU: Summer Intern)

High School Students and Teachers

1) Mentored 1 high school teacher for summer research project.
2) Mentored 6 high school students for their summer research projects.

I) <u>Invited Presentations</u> (since 2000)

1) *In planta* "Green Engineering" of variable sizes and exotic shapes of Gold Nanoparticles: An integrative eco-friendly approach. Periyar University, Salem, TN, India, December 2010.
2) Metal tolerance mechanisms in *Sesbania*. University of Texas, El Paso, TX, April 2008.
3) Biochemical and Molecular mechanism of metal tolerance and accumulation in *Sesbania drummondii*, Department of Biochemistry, RML Awadh University, Faizabad, India, January 2008.
4) Phytoremediation, a novel strategy for removal of toxic metals from environment: biochemical and molecular mechanisms, Environmental Science Program, The University of Texas at San Antonio, TX, April 2007.
5) Phytoremediation of Toxic Chemicals, Delhi University, India, April 2005
5) The Removal of Contaminants using Plants, U.S. Horticultural Research Laboratory ARS-USDA, Ft. Pierce, FL, February 2005
6) Nanotechnology: Applications and Synthesis in Biological System. Alabama State University, Montgomery, AL (2003).
7) Analysis of rRNA gene sequences to study diversity of microorganisms in Mammoth Cave, Alabama State University, Montgomery, AL (2002).
8) Cu, Zn and Pb accumulation by *Sesbania drummondii* grown in aqueous solution, University of Texas at El Paso, TX (2001).

<u>TEACHING EXPERIENCE</u>

A) Western Kentucky University, Bowling Green, KY (1998-).

- <u>Undergraduate Courses</u>*:* Biological Concepts (BIOL 120), Introduction to Molecular and Cell Biology (BIOL 319), Introduction to Molecular and Cell Biology Laboratory (BIOL 322), Honors Colloquium-Biotechnology Ethics (COLL 301), Selected Topics in Biology (BIOL 475) and Plant Biotechnology (BIOL 496).
- <u>Graduate Courses</u>: Plant Biotechnology (BIOL 496G), Contemporary Research in Biology (BIOL 503), Investigations in Biology (BIOL 516), Thesis Research and Writing (BIOL 599) and Advanced Topics in Biology (BIOL 675).

B) Alabama State University, Montgomery, AL (1992-1998)

- Undergraduate Courses: General Biology (BIO 127), General Botany (BIO 241), Introductory Ecology (BIO 310), Research Techniques (BIO 350), Plant Biotechnology (BIO 450), Plant Physiology (BI 495).
- Graduate Courses: General Ecology (BIO 503), Cytogenetics (BIO 515), Advance Plant Physiology (BIO 612)

PUBLIC SERVICE

Kentucky Statewide Service

- Member, KY-EPSCoR Statewide committee (2003-)
- Board of Director, Kentucky Life Science Organization (2004-06)
- Member, Bio-Kentucky Planning Committee (2001-03)
- Member, Southeast BIO Organization.
- Chair, Agricultural Section, Kentucky Academy of Science
- Secretary, Agricultural Section, Kentucky Academy of Science
- Member, Nominating Committee, Kentucky Academy of Science

University Service (Western Kentucky University)

- Chair, Promotion & Tenure subcommittee
- Chair, Plant Molecular Biologist search committee
- Chair, Greenhouse committee
- Chair, Biotechnology Center Coordinator search committee
- Member, Faculty Mentoring Committee
- Member, Departmental Graduate Committee
- Member, WKU Technology Transfer and Commercialization Committee
- Member, WKU Intellectual Property Committee
- Member, Search Committee, Licensing Coordinator, Intellectual Property Office
- Member, WKU Graduate Council
- Member, Office of Sponsored Programs Advisory Committee
- Member, Biology Department Tenure & Promotion Committee (2000-)
- Building Ground Breaking Committee for Engineering and Biological Sciences Complex.
- Member, Ogden College of Science and Engineering Academic Complaint Committee
- Member, KAS Annual Meeting Organizing Committee, Bowling Green, KY
- Member, Search Committee for Microbiologist Position.
- Member, Graduate Student Committee
- Member, Biology Department Tenure and Promotion Committee
- Member, Biology Department Facilities and Space Committee
- Member, Head of the Department of Biology Search Committee
- Member, Department of Biology Cell Biologist Search Committee
- Member, Academic Probation Committee, Western Kentucky University

Alabama State University, Montgomery, AL (1992-1998)

- Member, Proposal Improvement Committee – Reviewed and critiqued institutional research proposals for improvement before submission for consideration of funding (1997).
- Member, Institutional Biosafety Committee – established the institutional policies according to NIH guidelines regarding use of recombinant organisms in research (1997).
- Member, Research and Creative Activity Committee – Organized Annual College of Arts and Science Research Symposium (1997).

- Chair, Graduate Student Training Committee – Coordinated the revision of departmental policies regarding graduate students admission, training and research (1996-97).
- Chair, Degree Competency Committee – Developed the competency criterion for different degree programs offered by department of biology (1996-97).
- Member, Committee for Ph.D. in Biology – Involved in developing the preproposal for Ph.D. program in biology (1996-97).
- Member, Honors Seminar Committee – Solicited the names of potential speakers for biomedical seminar series (1996-97).
- Member, Program Committee of the Marine Environmental Sciences Consortium – Represented Alabama State University as a consortium member (1993-97).
- Chair, Carmichael Award Committee for Alabama Academy of Science – Coordinated the selection of best student paper published in Journal of Alabama Academy of Sciences, and presented the award during annual meeting (1994-1996).
- Member, Wright A. Gardner Award Committee for Alabama Academy of Science – participated in the selection of a scientist in Alabama who has contributed significantly in sciences (1994-95).
- Member, Carmichael Award Committee for Alabama Academy of Science – Selected best student papers published in Journal of Alabama Academy of Sciences (1993-94).
- Judge – Brewbaker High School Science Fair, Montgomery, AL (1994-97).
- Coordinated Student Recruitment Initiative sponsored by Alabama A & M University, Huntsville, AL to expand the effort to recruit qualified minority graduate students for M.S. and Ph.D. programs in sciences (1994).
- Member, Research and Creative Activity Committee – Organized Annual College of Arts and Science Research Symposium (1993).
- Member, Research and Creative Activity Committee – Organized Annual College of Arts and Science Research Symposium (1993).

Membership to Professional Societies

American Society of Plant Biologists, American Society of Agronomy, Kentucky Academy of Science, Society of In Vitro Biology, Mid-West Crown Gall Society, Alabama Academy of Science