

CURRICULUM VITAE

NAME

Vivanco, Jorge M

ADDRESS

Horticulture and Landscape Architecture
College of Agricultural Sciences

Shepardson

PHONE

(970) 491-7170

EDUCATION

1999 Ph D, The Pennsylvania State University

1994 BS, Universidad Nacional Agraria

ACADEMIC POSITIONS

1995 - 1999 Graduate Research Assistant, Penn State University.

OTHER POSITIONS

2002 - Present Affiliate Faculty, Colorado State University.

2002 - Present Affiliate Faculty, Colorado State University.

2000 - Present Assistant Professor, Colorado State University.

1999 - 2000 Post-Doc, Rutgers University.

1998 - 2000 Consultant, Sigma Co.

PUBLISHED WORKS

Books

Vivanco, J. M. (2013). Understanding root-microbiome interactions. In FJ de Bruijn (Ed.), *Molecular Microbial Ecology of the Rhizosphere* (pp. 745-754). John Wiley & Sons, Inc.

(2012). *Secretions and Exudates in Biological Systems*. Springer-Verlag Berlin Heidelberg.

(2011). *Chemical Biology of the Tropics: An Interdisciplinary Approach*. Springer-Verlag Berlin Heidelberg.

Refereed Journal Articles

Vivanco, J. M. (2013). Potential impact of soil microbiomes on the leaf metabolome and on herbivore feeding behavior. *New Phytologist*, 198, 264-273.

Vivanco, J. M. (2013). Relationships between Arabidopsis genotype-specific biomass accumulation and

- associated soil microbial communities. *Botany* 10.1139/cjb-2012-0217, 19, 123-126.
- Vivanco, J. M. (2013). Root architecture of *Arabidopsis* is affected by competition with neighbouring plants. *Plant Growth Regulation* DOI 10.1007/s10725-013-9786-7, 70, 141-147.
- (2012). Activation of the jasmonic acid plant defence pathway alters the composition of rhizosphere bacterial communities. *PLoS ONE*.
- (2012). Application of natural blends of phytochemicals derived from the root exudates of *Arabidopsis* to the soil reveal that phenolic related compounds predominantly modulate the soil microbiome. *Journal of Biological Chemistry* (in press).
- (2012). Harnessing the rhizosphere microbiome through plant breeding and agricultural management. *Plant and Soil*, 360, 13-Jan.
- (2012). Influence of ATP-binding cassette transporters in root exudation of phytoalexins, signals, and in disease resistance. *Frontiers in Plant Science* doi: 10.3389/fpls.2012.00149.
- (2012). Isolation and characterization of lignin-degrading bacteria from rainforest soils. *Biotechnology and Bioengineering* (In Press).
- (2012). Manipulating the soil microbiome to increase plant health and soil fertility. *Biol Fertil Soils*, 48, 489-499.
- (2012). Plant inhabiting ant, *Pseudomyrmex triplarinus*, utilizes chemical cues for host discrimination. *Biotropica*, 44, 246-253.
- (2012). Potential impact of soil microbiomes on the leaf metabolome and on herbivore feeding behavior. *New Phytologist*.
- (2012). Relationships between *Arabidopsis* genotype-specific biomass accumulation and associated soil microbial communities. *Botany* 10.1139/cjb-2012-0217.
- (2012). Root architecture of *Arabidopsis* is affected by competition with neighbouring plants. *Plant Growth Regulation* DOI 10.1007/s10725-013-9786-7.
- (2012). Root exudation of phytochemicals in *Arabidopsis* follows specific patterns that are developmentally programmed and correlate with soil microbial functions. *PLoS ONE*.
- (2012). Root secreted metabolites and proteins are involved in the early events of plant-plant recognition prior to competition. *PLoS ONE* 7(10): e46640. doi:10.1371/journal.pone.0046640, 7(10).
- (2012). Soil microbiomes vary in their ability to confer drought tolerance to *Arabidopsis*. *Applied Soil Ecology*.
- (2011). *Enterobacter soli* sp. nov: A lignin-degrading γ -Proteobacteria isolated from soil. *Current Microbiology*, 62, 1044-1049.
- (2011). Expression of industrially relevant laccases: prokaryotic style. *Trends in Biotechnology*, 29, 480-489.
- (2011). Plant inhabiting ant, *Pseudomyrmex triplarinus*, utilizes chemical cues for host discrimination. *Biotropica* DOI: 10.1111/j.1744-7429.2011.00786.x.
- (2011). The effect of root exudates on root architecture in *Arabidopsis thaliana*. *Plant Growth Regulation*, 64, 241-249.
- (2010). Negative Effects of Sample Pooling on PCR-Based Estimates of Soil Microbial Richness and Community

- Structure. *Appl Environ Microb*, 76, 2086- 2090.
- (2010). Plant neighbor identity influences plant biochemistry and physiology related to defense. *Bmc Plant Biol*: <http://www.biomedcentral.com/1471-2229/10/115>, 10, 115.
- (2010). *Pseudomonas putida* KT2440 causes induced systemic resistance and changes in Arabidopsis root exudation. *Env Microbiol Rep*, 2, 381-388.
- Vivanco, J. M., Jayanty, S. S. (2010). Pyrosequencing Assessment of Soil Microbial Communities. *Organic and Conventional Potato Farms Plant Disease*, November, 94(11), 1329-1335.
- (2010). Pyrosequencing assessment of soil microbial communities in organic and conventional potato farms. *Plant Disease*, 94, 1329-1335.
- (2010). Root secretion of defense-related proteins is development-dependent and correlated with flowering time. *Journal of Biological Chemistry*, 285, 30654-30665.
- (2010). Root Secretion of Phytochemicals in Arabidopsis Is Predominantly Not Influenced by Diurnal Rhythms. *Mol Plant*, 3, 491-498.
- (2010). Root-microbe interactions: the importance of protein secretion. *Current Proteomics*, 7, 265-274.
- (2009). 7,8-benzoflavone. *Phytochemistry*, 70, 156-156.
- (2009). An ABC Transporter Mutation Alters Root Exudation of Phytochemicals That Provoke an Overhaul of Natural Soil Microbiota. *Plant Physiol*, 151, 2006-2017.
- (2009). Bacterial Attraction and Quorum Sensing Inhibition in *Caenorhabditis elegans* Exudates. *J Chem Ecol*, 35, 878-892.
- (2009). Intraspecific and Interspecific Interactions Mediated by a Phytotoxin, (-)-Catechin, Secreted by the Roots of *Centaurea maculosa* (Spotted Knapweed) (vol 29, pg 2397, 2003). *J Chem Ecol*, 35, 860-860.
- (2009). Ipomopsin and hymenain, two biscoumarins from seeds of *Hymenaea courbaril*. *Phytochem Lett*, 2, 59-62.
- (2009). Phytotoxic polyacetylenes from roots of Russian knapweed (*Acroptilon repens* (L) DC) (vol 69, pg 2572, 2008). *Phytochemistry*, 70, 437-437.
- (2009). Plant origin and ploidy influence gene expression and life cycle characteristics in an invasive weed. *Bmc Plant Biol*, 9.
- (2009). Regulation and function of root exudates. *Plant Cell Environ*, 32, 666-681.
- (2009). Rhizosphere chemical dialogues. *Curr Opin Biotech*, 20, 642-650.
- (2009). The Effects of Flavonoid Allelochemicals from Knapweeds on Legume-Rhizobia Candidates for Restoration. *Restor Ecol*, 17, 506-514.
- (2008). A molecular approach to understanding plant-plant interactions in the context of invasion biology. *Funct Plant Biol*, 35, 1123-1134.
- (2008). A selective, sensitive, and rapid in-field assay for soil catechin, an allelochemical of *Centaurea maculosa*. *Soil Biol Biochem*, 40, 1189-1196.

- (2008). Allelopathy. *Soil Biol Biochem*, 40, 105-117.
- (2008). Altered profile of secondary metabolites in the root exudates of Arabidopsis ATP-binding cassette transporter mutants. *Plant Physiol*, 146, 762-771.
- (2008). No evidence for trade-offs. *Ecol Monogr*, 78, 369-386.
- (2008). Novel role for pectin methylesterase in Arabidopsis. *Bba-Gen Subjects*, 1780, 773-783.
- (2008). Phytotoxic catechin leached by seeds of the tropical weed *Sesbania virgata*. *J Chem Ecol*, 34, 681-687.
- (2008). Phytotoxic polyacetylenes from roots of Russian knapweed (*Acroptilon repens* (L) DC). *Phytochemistry*, 69, 2572-2578.
- (2008). Root exudates regulate soil fungal community composition and diversity. *Appl Environ Microb*, 74, 738-744.
- (2008). Root-microbe communication through protein secretion. *J Biol Chem*, 283, 25247-25255.
- (2008). Transcriptome analysis of Arabidopsis roots treated with signaling compounds. *New Phytol*, 179, 209-223.
- (2007). A first step in understanding an invasive weed through its genes. *Bmc Plant Biol*, 7.
- (2007). A putative allelopathic agent of Russian knapweed occurs in invaded soils. *Soil Biol Biochem*, 39, 1812-1815.
- (2007). Chemical facilitation and induced pathogen resistance mediated by a root-secreted phytotoxin. *New Phytol*, 173, 852-860.
- (2007). Concentrations of the allelochemical (+/-)-catechin in *Centaurea maculosa* soils. *J Chem Ecol*, 33, 2337-2344.
- (2007). Effect of transporters on the secretion of phytochemicals by the roots of Arabidopsis thaliana. *Planta*, 225, 301-310.
- (2007). No evidence for root-mediated allelopathy in *Centaurea solstitialis*, a species in a commonly allelopathic genus. *Biol Invasions*, 9, 897-907.
- (2007). Soil fungal abundance and diversity. *Isme J*, 1, 763-765.
- (2007). The floral volatile, methyl benzoate, from snapdragon (*Antirrhinum majus*) triggers phytotoxic effects in Arabidopsis thaliana. *Planta*, 226, 10-Jan.
- (2007). Use of the ITS primers, ITS1F and ITS4, to characterize fungal abundance and diversity in mixed-template samples by qPCR and length heterogeneity analysis. *J Microbiol Meth*, 71, 14-Jul.
- (2006). Can plant biochemistry contribute to understanding of invasion ecology? *Trends Plant Sci*, 11, 574-580.
- (2006). Oxalate contributes to the resistance of *Gaillardia grandiflora* and *Lupinus sericeus* to a phytotoxin produced by *Centaurea maculosa*. *Planta*, 223, 785-795.
- (2006). Ribosome-inactivating proteins in edible plants and purification and characterization of a new ribosome-inactivating protein from *Cucurbita moschata*. *Bba-Gen Subjects*, 1760, 783-792.

- (2006). The role of root exudates in rhizosphere interactions with plants and other organisms. *Annu Rev Plant Biol*, 57, 233-266.
- (2005). Analysis of natural flavonoids by microchip-micellar electrokinetic chromatography with pulsed amperometric detection. *Analyst*, 130, 694-700.
- (2005). Down regulation of virulence factors of *Pseudomonas aeruginosa* by salicylic acid attenuates its virulence on *Arabidopsis thaliana* and *Caenorhabditis elegans*. *Infect Immun*, 73, 5319-5328.
- (2005). Dual role for an allelochemical. *J Ecol*, 93, 1126-1135.
- (2005). *Enterococcus faecalis* mammalian virulence-related factors exhibit potent pathogenicity in the *Arabidopsis thaliana* plant model. *Infect Immun*, 73, 464-475.
- (2005). Insect herbivory stimulates allelopathic exudation by an invasive plant and the suppression of natives. *Ecol Lett*, 8, 209-217.
- (2005). Mediation of pathogen resistance by exudation of antimicrobials from roots. *Nature*, 434, 217-221.
- (2005). Natural selection for resistance to the allelopathic effects of invasive plants. *J Ecol*, 93, 576-583.
- (2005). Plant models for animal pathogenesis. *Cell Microbiol*, 7, 315-324.
- (2005). Screening of grassland plants for restoration after spotted knapweed invasion. *Restor Ecol*, 13, 725-735.
- (2005). Soil nematodes mediate positive interactions between legume plants and rhizobium bacteria. *Planta*, 222, 848-857.
- (2005). *Staphylococcus aureus* pathogenicity on *Arabidopsis thaliana* is mediated either by a direct effect of salicylic acid on the pathogen or by SA-dependent, NPR1-independent host responses. *Plant J*, 42, 417-432.
- (2004). Biochemical and physiological mechanisms mediated by allelochemicals. *Curr Opin Plant Biol*, 7, 472-479.
- (2004). Biocontrol of *Bacillus subtilis* against infection of *Arabidopsis* roots by *Pseudomonas syringae* is facilitated by biofilm formation and surfactin production. *Plant Physiol*, 134, 307-319.
- (2004). Biogeographical variation in community response to root allelochemistry. *Ecol Lett*, 7, 285-292.
- (2004). How plants communicate using the underground information superhighway. *Trends Plant Sci*, 9, 26-32.
- (2004). Isolation and characterization of an RIP (ribosome-inactivating protein)-like protein from tobacco with dual enzymatic activity. *Plant Physiol*, 134, 171-181.
- (2004). Phytotoxic and antimicrobial activities of catechin derivatives. *J Agr Food Chem*, 52, 1077-1082.
- (2004). Plant root-derived allelochemicals as natural herbicides. *Abstr Pap Am Chem S*, 227, U27-U27.
- (2004). Proton-transfer-reaction mass spectrometry as a new tool for real time analysis of root-secreted volatile organic compounds in *arabidopsis*. *Plant Physiol*, 135, 47-58.
- (2004). *Pseudomonas aeruginosa*-plant root interactions- Pathogenicity, biofilm formation, and root exudation. *Plant Physiol*, 134, 320-331.
- (2004). Purification of an isoform of patatin with antimicrobial activity against *Phytophthora infestans*. *Plant*

Physiol Bioch, 42, 647-655.

- (2004). Ribosome-inactivating proteins in plant biology. *Planta*, 219, 1093-1096.
- (2004). The N-glycosidase activity of the ribosome-inactivating protein ME1 targets single-stranded regions of nucleic acids independent of sequence or structural motifs. *J Biol Chem*, 279, 34165-34174.
- (2003). 7,8-Benzoflavone. *Phytochemistry*, 64, 493-497.
- (2003). Allelopathy and exotic plant invasion. *Science*, 301, 1377-1380.
- (2003). Andean root and tuber crops. *Hortscience*, 38, 161-167.
- (2003). Antioxidant activity and total phenolic content of Iranian *Ocimum* accessions. *Food Chem*, 83, 547-550.
- (2003). Ethylene induced secretion of a ribosome inactivating protein from roots and hairy root cultures of *Phytolacca americana*. *Nato Sci Ser I Life*, 349, 170-174.
- (2003). In vitro activities of *Maesa lanceolata* extracts against fungal plant pathogens. *Fitoterapia*, 74, 312-316.
- (2003). Intraspecific and interspecific interactions mediated by a phytotoxin, (-)-catechin, secreted by the roots of *Centaurea maculosa* (spotted knapweed). *J Chem Ecol*, 29, 2397-2412.
- (2003). Metabolic profiling of root exudates of *Arabidopsis thaliana*. *J Agr Food Chem*, 51, 2548-2554.
- (2003). Molecular and biochemical characterization of an enzyme responsible for the formation of hypericin in St John's Wort (*Hypericum perforatum* L). *J Biol Chem*, 278, 32413-32422.
- (2003). Molecular characterization and post-transcriptional regulation of ME1, a type-I ribosome-inactivating protein from *Mirabilis expansa*. *Planta*, 217, 498-506.
- (2003). Root exudation and rhizosphere biology. *Plant Physiol*, 132, 44-51.
- (2003). Root specific elicitation and exudation of fluorescent beta-carbolines in transformed root cultures of *Oxalis tuberosa*. *Plant Physiol Bioch*, 41, 345-353.
- (2003). Structure-dependent phytotoxicity of catechins and other flavonoids. *J Agr Food Chem*, 51, 897-901.
- (2002). Chemical characterization of basil (*Ocimum basilicum* L) found in local accessions and used in traditional medicines in Iran. *J Agr Food Chem*, 50, 5878-5883.
- (2002). Enantiomeric-dependent phytotoxic and antimicrobial activity of (+/-)-catechin: A rhizosecreted racemic mixture from spotted knapweed (Retracted article See vol 151, pg 967, 2009). *Plant Physiol*, 128, 1173-1179.
- (2002). Enzymatic specificity of three ribosome-inactivating proteins against fungal ribosomes, and correlation with antifungal activity. *Planta*, 216, 227-234.
- (2002). Exudation of fluorescent beta-carbolines from *Oxalis tuberosa* L roots (Retracted article See vol 71, pg 123, 2010). *Phytochemistry*, 61, 539-543.
- (2002). Factors affecting growth of cell suspension cultures of *Hypericum perforatum* L (St John's wort) and production of hypericin. *In Vitro Cell Dev-Pl*, 38, 58-65.
- (2002). In vitro propagation of *Spilanthes mauritiana* DC, an endangered medicinal herb, through axillary bud cultures. *In Vitro Cell Dev-Pl*, 38, 598-601.

- (2002). Isolation and characterization of a novel ribosome-inactivating protein from root cultures of pokeweed and its mechanism of secretion from roots. *Plant Physiol*, 130, 164-178.
- (2002). Jasmonic acid-induced hypericin production in cell suspension cultures of *Hypericum perforatum* L (St John's wort). *Phytochemistry*, 60, 289-293.
- (2001). Invited review. *In Vitro Cell Dev-Pl*, 37, 730-741.

Non-Refereed Journal Articles

- Vivanco, J. M. (2016). Soil memory as a potential mechanism for encouraging sustainable plant health and productivity. *Current Opinion in Biotechnology*, 38, 137-142.
- Vivanco, J. M. A unified initiative to harness the Earth's microbiomes. *Science* 2015, 350, 507-508.
- Vivanco, J. M. (2015). Impacts of bulk soil microbial community structure on rhizosphere microbiomes of Zea mays. *Plant and Soil*, 392.
- Vivanco, J. M. (2015). Linking jasmonic acid signaling, root exudates and rhizosphere microbiomes. *Molecular Plant Microbe Interactions*, 28, 1049-1058.
- Vivanco, J. M. (2015). Organic acids from root exudates of banana help root colonization of PGPR strain *Bacillus amyloliquefaciens* NJN-6. *Scientific Reports*, 5:13438.
- Vivanco, J. M. (2015). Roots from distinct plant developmental stages are capable of rapidly selecting their own microbiome without the influence of environmental and soil edaphic factors. *Soil Biology and Biochemistry*, 89, 206-209.
- Vivanco, J. M. (2015). *Bacillus* spp. From rainforest soil promote plant growth under limited nitrogen conditions. *J Appl Microbiol*.
- Vivanco, J. M. (2014). Plant-plant-microbe mechanisms involved in soil-borne disease suppression on a maize and pepper intercropping system. *PLOS ONE*.
- Vivanco, J. M. (2014). De-coupling of root-microbiome associations followed by antagonist inoculation improves rhizosphere soil suppressiveness. *Biology and Fertility of Soils*, 50, 217-224.
- Vivanco, J. M. (2014). Enhanced rhizosphere colonization of beneficial *Bacillus amyloliquefaciens* SQR9 by pathogen infection. *FEMS Microbiology Letters*.
- Vivanco, J. M. (2014). Rhizosphere microbiome assemblage is affected by plant development. *ISME Journal (Nature journal)*.
- Vivanco, J. M. (2013). Activation of the jasmonic acid plant defence pathway alters the composition of rhizosphere bacterial communities. *PLoS ONE*, 8(2): e56457.
- Vivanco, J. M. (2013). Application of natural blends of phytochemicals derived from the root exudates of *Arabidopsis* to the soil reveal that phenolic related compounds predominantly modulate the soil microbiome. *Journal of Biological Chemistry*, 288, 4502-4512.
- Vivanco, J. M. (2013). Assessment of the role of fluorescent root and seed exudates in crop plants. *Journal of Plant Nutrition*, 36, 811-824.
- Vivanco, J. M. (2013). Effect of plant sterols and tannins on *Phytophthora ramorum* growth and sporulation.

Journal of Chemical Ecology, 39, 733-743.

Vivanco, J. M. (2013). Isolation and characterization of lignin-degrading bacteria from rainforest soils. *Biotechnol Bioeng.*, 110, 1616–1626.

Vivanco, J. M. (2013). Rhizosphere microbiome assemblage is affected by plant development. *ISME Journal (Nature journal)*.

Vivanco, J. M. (2013). Root exudation of phytochemicals in *Arabidopsis* follows specific patterns that are developmentally programmed and correlate with soil microbial functions. *PLoS ONE*, 8(2): e55731.

Vivanco, J. M. (2013). Soil microbiomes vary in their ability to confer drought tolerance to *Arabidopsis*. *Applied Soil Ecology*, 68, 1-9.

Vivanco, J. M. (2013). Variations in diversity and richness of gut bacterial communities of termites (*Reticulitermes flavipes*) fed with grassy and woody substrates. *Microbial Ecology*, 65, 531-536.

Vivanco, J. M. De-coupling of root- microbiome associations followed by antagonist inoculation improves rhizosphere soil suppressiveness. *Biology and Fertility of Soils*.

Book Review

(2012). *Coadaptationary aspects of the underground communication between plants and other organisms* (pp. 361-375). Biocommunication of Plants.

(2012). *Lignocellulose decomposition by microbial secretions. In Secretions and Exudates in Biological Systems* (pp. 125-154). Springer.

(2012). *Understanding root-microbiome interactions. In Molecular Microbial Ecology of the Rhizosphere* (pp. 745-754). John Wiley & Sons, Inc.

(2011). *Biodiversity* (pp. 14-Jan). Chemical Biology of the Tropics, Springer.

(2011). *Chemical ecology: definition and famous examples* (pp. 15-26). Chemical Biology of the Tropics, Springer.

(2011). *Proteins in the rhizosphere: another example of plant-microbe exchange* (pp. 95-116). Ecological Aspects of Nitrogen Metabolism in Plants, Wiley-Blackwell Press.

PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/PROFESSIONAL MEETINGS/WORKSHOPS

February 1, 2016, "Root-microbiome interactions in agricultural systems", Guatemalan Coffee Association.

November 18, 2015, "The root-microbiome: perspectives and future studies", RTR AGRO (Agriculture, Environment and Sustainable Development), INRA.

August 21, 2015, "Root-microbiome interactions in agricultural systems", 8th Annual Meeting of Papaya Producers of Mexico, Association of Papaya Producers of Mexico.

May 1, 2015, "Root and Rhizosphere Biology", University of Wyoming, Wyoming.

March 15, 2015, "Delivery of two classes on root and rhizosphere biology", The Netherlands.

December 10, 2014, "State of the art of root and rhizosphere biology", Louisville, CO.

November 24, 2014, "Biología de las raíces y microbios de suelo", Ica.

September 11, 2014, "Biología de las raíces y microbioma", Hermosillo, Mexico.

December 4, 2013, "Root and Rhizosphere Biology", Universidad del Valle, Universidad del Valle, Campus Zarzal, Cali, Colombia.

August 15, 2013, "Root and Rhizosphere Biology", 30th Mid-Atlantic Plant Molecular Biology Society Conference, same as above, Patuxent National Wildlife Center, MD.

June 7, 2013, "Root and Rhizosphere Biology", College of Resources & Environmental Sciences, Nanjing Agricultural University, Nanjing, Jiangsu Province, China, China.

May 14, 2013, "Root and Rhizosphere Biology", Canadian Society for Ecology and Evolution; special symposium "The Plant Microbiome", same as above, Kelowna, BC, Canada, peer-reviewed/refereed.

January 24, 2013, "Pioneer, Johnston, Iowa (January 24, 2013)", (Presenter) Vivanco, J. M., Iowa.

2012, "ATALAC-TECNICAÑA 2012 (Annual Meeting of the Latin American and Caribbean Sugar Producers), Cali, Colombia (September 13, 2012)".

2012, "Biochemistry Department, University of Rouen, Rouen, France (September 20, 2012)".

2012, "Graduate School: Best Option for a Creative Future. This lecture was give as part of "Food for Thought" a special professional development workshop organized by ASPB's Minority Affairs Committee. September 29-30, 2012. Embassy Suites Albuquerque, Albuquerque, NM."

2012, "Otsuka Agritechnology, Fertilizer and Cultivation Research Center, Tokushima, Japan (May 30, 2012)".

2011, "33rd Symposium on Biotechnology for Fuels and Chemicals, Seattle, WA (May 2-5, 2011)".

2011, "8th World Pepper Convention, Guanajuato, Mexico (May 26-28, 2011)".

2011, "International Conference on "Omics" in Soil Sciences: Relevance, Applications and Future Perspectives. Nanjing, China (November 19-24, 2011)".

2011, "National Renewable Energy Laboratory (Plant Sciences Working Group), Golden, CO (December 7, 2011)".

2011, "Plant Biology 2011, The Annual Meeting of the American Society of Plant Biologists – ASPB, Rhizosphere Biology Mini Symposium, Minneapolis, MN (August 6-10, 2011)".

2011, "Research Triangle Institute (RTI) International, Research Triangle Park, NC (April 27, 2011)".

2011, "XIX Annual Meeting of the Spanish Plant Physiology Society, Castellon, Spain (June 21-24, 2011)".

2010, "A UNDERGROUND COMMUNICATION BETWEEN ROOTS AND THE SOIL MICROBIOME All-Russia Research Institute for Agricultural Microbiology, St. Petersburg, Russia (September 22, 2010)".

2010, "UNDERGROUND COMMUNICATION BETWEEN ROOTS AND THE SOIL MICROBIOME Enza Zaden Inc., Enkhuizen, The Netherlands (October 22, 2010)".

2010, "UNDERGROUND COMMUNICATION BETWEEN ROOTS AND THE SOIL MICROBIOME Institute of Plant Sciences, University of Zürich, Switzerland (October 27, 2010)".

2010, "UNDERGROUND COMMUNICATION BETWEEN ROOTS AND THE SOIL MICROBIOME Syngenta Research Center, Stein, Switzerland (October 28, 2010)".

OTHER ACTIVITIES/ACCOMPLISHMENTS – PUBLICATIONS/SCHOLARLY RECORD

Vivanco, J. M. "Several patent applications submitted by CSURF." (Submitted: 2013, Application: 2013).

"1.Nitrogen Ideas Lab; National Science Foundation; \$186,178-2012-2013 PI

2.Understanding and developing microbiomes of drought and salinity mitigation; Sekisui Chemical Co.; \$120,000-2013-2014 PI

3.Biochemical and molecular analysis of a natural extract with beneficial properties for agriculture; Innovak Global; \$66,628-2012-2013 PI

4.Collaborative activities with Nanjing Agricultural University (NAU); NAU; \$23,000-2012 PI

5.Using soil amendments to improve soil health and to

optimize profitability in potato production; Colorado State Univ. Agricultural Experiment Station (CCPGA Project); \$19,500-2012-2013 Co-PI (PI Samuel Essah)." (Submitted: 2012, Application: 2012, Approved: 2012, Licensed: 2012).

TEACHING:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2016	Spring	HORT699 - Thesis	18	7
2015	Fall	HORT799 - Dissertation	18	3
2015	Fall	HORT401 - Medicinal and Value-Added Uses of Plants	3	24
2015	Fall	HORT698 - Research	18	18
2015	Fall	HORT784 - Supervised College Teaching	18	5
2015	Spring	HORT799 - Dissertation	18	3
2015	Spring	HORT486B - Practicum-General	6	1
2015	Spring	HORT698 - Research	18	13
2015	Spring	HORT784 - Supervised College Teaching	18	4
2014	Fall	HORT698 - Research	18	12
2014	Spring	HORT799 - Dissertation	18	3
2014	Spring	HORT401 - Medicinal and Value-Added Uses of Plants	3	24
2014	Spring	HORT698 - Research	18	10
2013	Fall	HORT495 - Independent Study	18	3
2013	Fall	HORT795 - Independent Study	18	1
2013	Fall	HORT698 - Research	18	10
2013	Fall	HORT699 - Thesis	18	4
2013	Spring	HORT698 - Research	18	13
2013	Spring	HORT699 - Thesis	18	4
2013	Spring	HORT601 - Topics in Root and Rhizosphere Biology	2	7
2013	Spring	HORT601 - Topics in Root and Rhizosphere Biology - Recitation	0	7
2012	Fall	HORT698 - Research	18	15
2012	Fall	HORT699 - Thesis	18	2
2012	Spring	HORT401 - Medicinal and Value-Added Uses of Plants	3	36
2012	Spring	HORT698 - Research	18	14
2012	Spring	HORT699 - Thesis	18	3
2011	Fall	HORT698 - Research	18	15
2011	Fall	HORT699 - Thesis	18	3
2011	Spring	HORT698 - Research	18	9
2011	Spring	HORT792 - Seminar	1	7
2011	Spring	HORT601 - Topics in Root and Rhizosphere Biology	2	7
2011	Spring	HORT601 - Topics in Root and Rhizosphere Biology - Recitation	0	7
2010	Fall	HORT698 - Research	18	10
2010	Fall	HORT792 - Seminar	1	3
2010	Spring	HORT401 - Medicinal and Value-Added Uses of Plants	3	17
2009	Spring	HORT784 - Supervised College Teaching	18	3
2009	Spring	HORT601 - Topics in Root and Rhizosphere Biology	2	2
2009	Spring	HORT601 - Topics in Root and Rhizosphere Biology - Recitation	0	2
2008	Fall	HORT698 - Research	18	12
2008	Spring	CM799 - Dissertation	18	22
2008	Spring	HORT698 - Research	18	12
2007	Fall	CM799 - Dissertation	18	18
2007	Fall	HORT799 - Dissertation	18	3
2007	Fall	HORT698 - Research	18	7

EXTENSION/ENGAGEMENT ACTIVITIES/ACCOMPLISHMENTS

Field Day

Linking root studies with biological strategies to control nematodes on potatoes. Adult, Montevista, Colorado. Number of times program was made: 1. Total number of participants: 60. Percent Responsible: 1%. 1st Quarter 2015.

Presentation

Biological strategies to control nematodes on potatoes: field studies. Adult, Montevista, Colorado. Number of times program was made: 1. Total number of participants: 50. Percent Responsible: 50%. 1st Quarter 2016.

Root and Rhizosphere Concepts. Adult, Ica. Number of times program was made: 30. Percent Responsible: 50%. 3rd Quarter 2014.

Workshop

General concepts of soil microbiology and root-microbiome interactions. Adult, Alamosa, Colorado. Number of times program was made: 1. Total number of participants: 20. Percent Responsible: 50%. 1st Quarter 2016.

Concepts on root and rhizosphere biology for agricultural management. Total number of participants: 30. Percent Responsible: 70%. 2013.

COMMITTEES

Strategic and Financial Planning, (2010 - Present).

Fulbright Faculty Advisory Committee, (2012 - 2013).

Resident Instruction Committee, (2012 - Present).

Horticulture PhD Committee of Galal Salem, (January 1, 2015 - January 1, 2017).

Search for Crops for Health Faculty Position, (2013 - 2014).

Crops for Health Faculty Search Committee, (January 1, 2014 - June 1, 2014).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

ASPB - American Society for Plant Biologists. (2010 - 2014).

ASPB - American Society for Plant Biologists. (2010 - 2014).

Adaptive Behaviour. (2012 - Present).

Biology and Fertility of Soils. (2012 - Present).

FEMS Microbial Ecology. (2012 - Present).

Frontiers in Plant Science. (2012 - Present).

ISME. (2012 - Present).

Lehman College. (2012 - Present).

Microbial Ecology. (2012 - Present).

Reviewer, Ad Hoc Reviewer, Murdoch Charitable Trust. (2012 - Present).

Reviewer, Ad Hoc Reviewer, NASA Post doctoral program. (2012 - Present).

Reviewer, Ad Hoc Reviewer, NSF. (2012 - Present).

Member, NSF- Nitrogen Ideas lab. (2012 - Present).

Member, Plant and Soil (Editorial Duties). (2012 - Present).

Plant Cell and the Environment. (2012 - Present).

PLOS ONE. (2012 - Present).

Applied Soil Ecology. (2011 - Present).

BMC Plant Biology. (2011 - Present).

FEMS Microbial Ecology. (2011 - Present).

Reviewer, Ad Hoc Reviewer, Foundation for Polish Science. (2011 - Present).

Genes. (2011 - Present).

INIA - Peru. (2011 - Present).

ISME. (2011 - Present).

Journal of Chemical Ecology. (2011 - Present).

Journal of Plant Nutrition and Soil Science. (2011 - Present).

Molecules. (2011 - Present).

Reviewer, Ad Hoc Reviewer, New Jersey Ag. Expt Station. (2011 - Present).

Reviewer, Ad Hoc Reviewer, New Jersey Water Resources Research Institute. (2011 - Present).

Reviewer, Ad Hoc Reviewer, NSF. (2011 - Present).

Plant and Soil. (2011 - Present).

Member, Plant and Soil (Editorial Duties). (2011 - Present).

Plant Cell and the Environment. (2011 - Present).

Plant Physiology. (2011 - Present).

Plant Signaling and Behavior. (2011 - Present).

PNAS. (2011 - Present).

University of Ontario Institute of Technology. (2011 - Present).

Western Association of Graduate Schools (WAGS). (2011 - Present).

Wiley/Blackwell Press. (2011 - Present).

Agricultural and Food Chemistry. (2010 - Present).

Amino Acids. (2010 - Present).

Analytical Biochemistry. (2010 - Present).

Applied and Environmental Microbiology. (2010 - Present).

Applied Soil Ecology. (2010 - Present).

FEBS - Journal of the Federation of the Societies of Biochemistry and Molecular Biology. (2010 - Present).

Harvard University Press. (2010 - Present).

Reviewer, Ad Hoc Reviewer, Hong Kong Research Grants Council. (2010 - Present).

INTERNATIONAL MICROBIOLOGY. (2010 - Present).

Journal of Chemical Ecology. (2010 - Present).

Journal of Microbial Ecology. (2010 - Present).

Journal of Zhejiang University SCIENCE. (2010 - Present).

Microbial Ecology. (2010 - Present).

Molecular Plant Microbe Interactions. (2010 - Present).

New Phytologist. (2010 - Present).

Member, NSF Panel, Biomolecular Processes. (2010 - Present).

Reviewer, Ad Hoc Reviewer, NSF. (2010 - Present).

Phytopathology. (2010 - Present).

Plant and Soil. (2010 - Present).

Member, Plant and Soil (Editorial Duties). (2010 - Present).

Plant Biology. (2010 - Present).

Plant Ecology. (2010 - Present).

Plant Physiology. (2010 - Present).

PNAS - Proceedings of the National Academy of Sciences. (2010 - Present).

Revista de Biologia Tropical. (2010 - Present).

Scientia Agricola. (2010 - Present).

Sustainable Agriculture Reviews. (2010 - Present).

Reviewer, Ad Hoc Reviewer, The Volkswagen Foundation. (2010 - Present).

Reviewer, Ad Hoc Reviewer, USAID. (2010 - Present).

American Chemical Society Short Courses, La Jolla, CA. (2009 - Present).

Reviewer, Journal Article, Applied and Environmental Microbiology. (2015).

Reviewer, Journal Article, Applied Microbiology and Biotechnology. (2015).

Reviewer, Journal Article, ISME. (2015).

Reviewer, Journal Article, Microbial Ecology. (2015).

Reviewer, Journal Article, Nature. (2015).

Reviewer, Journal Article, PLOS ONE. (2015).

Reviewer, Journal Article, Soil Biology and Biochemistry. (2015).

Reviewer, Grant Proposal, Technology Foundation of The Netherlands. (2015).

Fulbright Faculty Adviser for the College of Agricultural Sciences at Colorado State University. (2012 - 2014).

Member, CSU Fulbright application review committee. (2011 - 2014).

Editor, Associate Editor, Frontiers in Plant Metabolism and Chemodiversity. (2011 - 2014).

Member, ASPB - American Society for Plant Biologists. (2010 - 2014).

Member, Committee on Strategic and Financial Planning. (2010 - 2014).

Committee Member, MS Graduate Committee – Defense of Anne Wrobetz, Civil, Environmental and Architectural Engineering Department, University of Colorado-Boulder. (November 1, 2014 - November 17, 2014).

Committee Member, NIH Panel, Washington DC. (April 6, 2014 - April 7, 2014).

Committee Member, Minority Affairs Committee, American Society of Plant Biologists-ASPB. (2010 - 2013).

Plant and Soil. (2010 - 2013).

26. Member of the Organizing Committee and Participant, “Food for Thought” a special professional development and networking in Plant Science workshop organized by ASPB’s Minority Affairs Committee, Embassy Suites Albuquerque, Albuquerque, NM (September 29-30, 2012). (2012).

27. Member of the Organizing Committee, Minority Affairs Committee Mini Symposium on How Plants Treat their

Friends and Enemies: Responses to Beneficial and Pathogenic Microbes, Plant Biology 2012, Austin, TX (July 20-24, 2012). (2012).

Member of the Organizing Committee, “This Land is OUR Land: Traditional Uses and Perspectives of the Land and its Chemistry”, a symposium within the 2012 SACNAS (A Society Devoted to Advancing Hispanics, Chicanos & Native Americans in Science) National Conference. Seattle, WA (October 11-14, 2012). (2012).

Editor, Associate Editor, Plant Signaling and Behavior. (2005 - 2012).

Graduate School: Best Option for a Creative Future. I delivered lectures as part of “Food for Thought” a special professional development workshop organized by ASPB’s Minority Affairs Committee. April 8-9, 2011. Kellogg West Conference Center, Pomona CA. (2011).

Member, Selection Committee for Monfort Professors (Endowed Professorship) at Colorado State Univ. (2011).

Member, Executive Committee Program in Molecular Plant Biology. (2010 - 2011).

Committee Chair, Graduate Admission Committee. (2010 - 2011).

Member, Thornton-Massa Nominating Committee. (2010 - 2011).

Scientific outreach for Oakwood school. (2010).

OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

For Profit Organization, Innovak Global, Stevia One, Intagri, Peru. (January 1, 2013 - December 31, 2013).

Innovak Global. (2011).

Stevia One. (2011).

Innovak Global. (2010).

Stevia One. (2010).

Oakwood School in Fort Collins. (2011 - Present).
