FABRICIO MEDINA-BOLIVAR, Ph.D.

Professor of Plant Metabolic Engineering
Department of Biological Sciences

Director of Environmental Sciences Graduate Program
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EDUCATION

1997 Ph.D. Plant Physiology, The Pennsylvania State University (State College, PA)
Thesis: Regulation of Constitutive and Inducible Secondary Metabolites in Hairy Root Cultures of *Hyoscyamus muticus*.
(H. Flores, advisor)

1992 Licentiate. Title of Biologist. Cayetano Heredia University and International Potato Center (www.cipotato.org). Lima, Peru
Thesis: *In Vitro* Organogenesis from Leaves, Roots and Internodes of Nine Cultivars of Sweet Potato (*Ipomoea batatas*): Hormonal and Anatomical Studies.
(J. Dodds, advisor)

1992 B. S. Biology. Universidad Peruana Cayetano Heredia. Lima, Peru.

PROFESSIONAL EXPERIENCE

Academic:

2022-present Director. Molecular Biosciences Graduate Program, Arkansas State University, Jonesboro, AR

2022-present Director. Environmental Sciences Graduate Program, Arkansas State University, Jonesboro, AR

2016-present Professor. Dept. of Biological Sciences, Arkansas State University, Jonesboro, AR

2009-2016 Associate Professor (Tenured in 2009). Arkansas Biosciences Institute/ Dept. of Biological Sciences, Arkansas State University, Jonesboro, AR

2005-2009 Assistant Professor, Arkansas Biosciences Institute/ Dept. of Biological Sciences, Arkansas State University, Jonesboro, AR

2002-2005 Research Director (VaTech's component) of The Virginia Consortium for Mucosal Therapy of Infectious and Autoimmune Diseases. Virginia Tech, Blacksburg, VA

2002-2005 Research Assistant Professor. Department of Plant Pathology, Physiology and Weed Science. Virginia Tech, Blacksburg, VA

1997-2002 Research Scientist. Department of Plant Pathology, Physiology and Weed Science. Fralin Biotechnology Center. Virginia Tech, Blacksburg, VA

1995-1997 Graduate Research Assistant. Department of Plant Pathology. The Pennsylvania State University, University Park, PA

1992-1995 Graduate Research Assistant. Biotechnology Institute. The Pennsylvania State University, University Park, PA

1989-1991 Undergraduate Research Assistant. Tissue Culture Laboratory, Department of Genetic Resources. International Potato Center. Lima, Peru

Corporate and Other Affiliations:

2018-present Executive Director, American Council for Medicinally Active Plants

2017-2021 Chair, Northeast Arkansas Hispanic Professional Network

2016-present Arkansas State University-Liaison, Northeast Arkansas Hispanic Professional Network

2016-2022 Board Member, Centro Hispano, Jonesboro, AR

2015-present Co-Founder, ParNative Inc., Jonesboro, AR

2014-2015 President, American Council for Medicinally Active Plants

2013-2015 Adjunct Professor (Profesor Visitante). Departamento de Fitotecnia. Universidad Nacional Agraria La Molina, Lima, Peru.

2012-2013 Vice-President. American Council for Medicinally Active Plants

2005-present Co-Founder and Chief Scientific Officer. Nature West Inc., Jonesboro, AR

2001-2010 Co-Founder and Vice President for Plant Diagnostics. Nature Diagnostics Inc., Blacksburg, VA.

2001-2002 Consultant. Yoder Brothers Inc., Alva, Fl.

2000 Consultant. Intellibridge Corporation. Washington, DC.

1999-2002 Plant Biotechnology Consultant. CropTech Corporation, Blacksburg, VA.

Service to Arkansas State University:

2022-2023 Member, Provost Search Committee

2022-2023 Member, Department of Biological Sciences, Cell Biology Faculty Search Committee,

2021-present President, Latina/o Faculty and Staff Association

2021-2022 Member, College of Sciences and Mathematics, Promotion, Retention and Tenure Committee

2020-2023 Co-Advisor, Hermana y Hermana

2020-present Chair, Molecular Biosciences Graduate Program Admissions Committee

2019-2020 Member, Department of Biological Sciences, Department Chair Search Committee

2019 Member, College of Sciences and Mathematics, Dean Search Committee

2018 Member, Intellectual Property Committee

2017-2021 Member, Department of Biological Sciences, Biotechnology Committee

2017 Member, Arkansas Biosciences Institute Advisory Committee

2017-present Member, Department of Biological Sciences Promotion, Retention and Tenure Committee

2017 Member, Chancellor Search Committee

2016-2018 Member, Graduate Council

2015 Member, Research Strategic Planning Committee

2015 Member, Faculty Achievements Award Committee

2015 Member, Intellectual Property Ad Hoc Committee

2013-2015 Chair, Patent Force Task Faculty Senate Committee

2013-2018 Chair, Institutional Biosafety Committee

2012-present Member, Molecular Biosciences Graduate Program Committee

2012-2015 Member, Biological Sciences Promotion, Retention and Tenure Committee

2013-2014 Member, Aquatic Ecologist Faculty Search Committee

2006-2017 Chair, Plant Biotechnology Discussion Group

HONORS AND AWARDS (2006-PRESENT)

2024 Inducted into the inaugural class of the Arkansas Latino Hall of Fame. North Little Rock, Arkansas. (October 24, 2024)

2024 Invited Speaker. USDA Agricultural Biotechnology Workshop. Inter American University of Puerto Rico – Barranquitas. June 14, 2024.

2024 "Heredianos que Inspiran", Universidad Peruana Cayetano Heredia. (May 14, 2024 – Lima, Peru; Invited alumni video)

2024 Excellence in Community Diversity Award, Arkansas State University. (April 23, 2024)

2024 Invited Keynote Speaker. Pharmacology Webinar Series. Penn State College of Medicine. (April 4, 2024)

2024 Invited Keynote Speaker. Pre-Congress Webinar. Asociación Mexicana de Investigación en Productos Naturales. January 20, 2024.

2024 Scientific Program Committee member, 13th Annual Conference of American Council for Medicinally Active Plants (October 3-6, 2024 – Texas).

2023 Scientific Program Committee member, 12th Annual Conference of American Council for Medicinally Active Plants (October 18-21, 2023 – West Virginia).

2021 Scientific Program Committee member, 11th Annual Conference of American Council for Medicinally Active Plants (June 28-July 2, 2022 – Puerto Rico).

2021 Inducted into the Arkansas Research Alliance as a Fellow Member

2021 Elected presenter; Live Museum, Hispanic Heritage Month (September 23)

2021	Scientific Program Committee member, 10th Annual and 1st Virtual Conference of American Council for Medicinally Active Plants (June 24-25).
2021	Invited Keynote Speaker, 10th Annual and 1st Virtual Conference of American Council for Medicinally Active Plants (June 24-25).
2019	Invited Feature Speaker, Nepal Academy of Sciences and Technology-NAST, Kathmandu, Nepal.
2019	Opening Keynote Speaker, 9th Conference American Council for Medicinally Active Plants – India
2019	Chair, Metabolic Engineering Session, 9th Conference American Council for Medicinally Active Plants – India
2018	Invited Member, International Scientific Committee, 9th Conference American Council for Medicinally Active Plants - India
2018	Elected Executive Director, American Council for Medicinally Active Plants
2017	Elected Chair, Northeast Arkansas Hispanic Professional Network
2017	Invited TEDx Speaker. Arkansas State University
2017	Research Professor of the Month. January 2017. Arkansas State University
2016	Elected Member, International Scientific Committee, IX Latin American and Caribbean Agricultural and Biotechnology Meeting, REDBIO 2016-PERU
2016	Program Chair and Organizer, 7th International Conference of the American Council for Medicinally Active Plants, Lima, Peru
2016	Invited Piano Performer. Doctors in Concert. Fundraiser event for St. Jude Children's Research Hospital, Memphis , TN
2015	Statewide Arkansas Biosciences Institute Investigator of the Year
2015	Re-Elected President, American Council for Medicinally Active Plants
2014-present	Associate Editor, Journal of Medicinally Active Plants
2014	Elected President, American Council for Medicinally Active Plants
2013	Collaborative research paper ("Neuroprotective effect of peanut hairy root extract against oxidative stress in PC12 derived neurons") between Dr. Malathi Srivatsan

and Dr. Fabricio Medina-Bolivar received the 2013 Senior Investigator Award at the Arkansas Biosciences Institute Fall Research Symposium. Little Rock, AR

2012 Host and Program Chair, 3rd Annual Conference of the American Council for Medicinally Active Plants, Jonesboro, AR

2012-2013 Elected Vice-President, American Council for Medicinally Active Plants

2012 Feature Speaker, "A Tribute to Spanish Culture" – HOLA (Hispanic Outreach and Latino Outreach Appreciation). Certificate of Appreciation – "An Inspiring Man Who is a Role Model for Hispanic students at Arkansas State University".

2011 Outstanding Hispanic Achiever of the Year, Hispanic Community Services of Jonesboro, AR

2011 Invited Chair, session "Biotechnology of Medicinally Active Plants". 2nd Annual Conference of ACMAP, Huntsville, AL

2011 Faculty Achievement Award-Scholarship, College of Sciences and Mathematics, Arkansas State University

2010 Invited Chair, session "Biotechnology of Medicinally Active Plants". 1st Annual Conference of ACMAP, New Brunswick, NJ

2008 NIH Special Emphasis Panel, Scientific Review group member, "Transcriptomics of Medicinal Plants".

2008 Invited Chair, session "New Strategies for the Production of Specialized Metabolites", Congress on In Vitro Biology, Tucson, AZ

2008 Invited Chair, session "Develop Bioprocesses for the Production of High Value Medicines", Congress of International Drug Discovery Science and Technology, Beijing, CHINA

2008 Co-editor, special issue "Hairy Roots: Applications in Biotechnology, Elec. J. Int. Biosciences

2007 Coordinated research agreement between Arkansas State Univ. and Univ. Agraria, PERU

2007 Coordinated reseach agreement between Arkansas State Univ. and Cassara Foundation, ARGENTINA

2007 Elected member of the American Consortium for Aromatic and Medicinal Plants

2006 Co-organizer of the 1st International Workshop on Hairy Roots, Jonesboro, AR

2006 Recipient of the Arthur Neish Award from the Phytochemical Society of North America

Proposal Reviewer*:*

American Institute of Science, US Army Medical Research and Materiel Command
Austrian Science Fund
Binational Agricultural Research and Development Fund (BARD)
North Carolina Biotechnology Center
NIH Special Emphasis Panel

Manuscript Reviewer*:*

Applied Biochemistry and Bioengineering
Archives of Microbiology
Bioprocess and Biosystems Engineering
Biotechnology Advances
Engineering in Life Sciences
In Vitro Plant Cellular and Developmental Biology
Journal of Agricultural and Food Chemistry
Journal of Agricultural and Food Science
Journal of Medicinally Active Plants
Journal of Bioprocessing and Biotechniques
Plant Cell Reports
Plant Cell Tissue and Organ Culture
Plant Physiology
Plant Physiology and Biochemistry
Planta Medica
Scientific Research and Essays
Transgenic Research

PROFESSIONAL AND HONOR SOCIETY MEMBERSHIPS

American Council of Medicinally Active Plants
American Chemical Society
American Society of Pharmacognosy
American Society for Biochemistry and Molecular Biology
Society for In Vitro Biology

PUBLICATIONS

Peer-reviewed Publications:

1. Porobo Dessai A, Gosukonda R, Blay E, Dumenyo C, **Medina-Bolivar F**, Prakash C. 1995. Plant regeneration of sweet potato (*Ipomoea batatas* L.) from leaf explants in vitro using a two-stage protocol. Sciencia Horticulturae. 62: 217-224.

2. **Medina-Bolivar F**, Flores H. 1995. Studies on the manipulation of tropane alkaloid biosynthesis in hairy roots of *Hyoscyamus muticus*. *In:* Phytochemicals and Health. D.L. Gustine and H. Flores (eds). American Society of Plant Physiology, MD. pp 297-299.

3. Flores H, **Medina-Bolivar F**. 1995. Root culture and plant natural products: "Unearthing" the hidden half of plant metabolism. Plant Tissue Culture and Biotechnology. 1: 59-74.

4. **Medina-Bolivar F**, Flores H. 1995. Selection for hyoscyamine and cinnamoyl putrescine overproduction in cell and root cultures of *Hyoscyamus muticus*. Plant Physiology. 108: 1553-1560.

5. **Medina-Bolivar F**, Flores H. 1998. Biosynthesis of constitutive versus inducible metabolites in hairy root cultures of *Hyoscyamus muticus*. *In:* Radical Biology: Advances and Perspectives on the Function of Plant Roots. H.E. Flores, J.P. Lynch, D. Eissenstat (eds), American Society of Plant Physiologists, Rockville, MD, pp. 430-431.

6. **Medina-Bolivar F**, Wright R, Sentz D, Barroso L, Wilkins T, Petri Jr. W, Cramer C. 2003. A non-toxic lectin for mucosal antigen delivery of plant-based vaccines. Vaccine. 21:997-1005.

7. Lorence A, **Medina-Bolivar F**, Nessler C. 2004. Camptothecin and 10-hydroxycampthotecin from *Camptotheca acuminata* hairy roots. Plant Cell Reports. 22:437-441.

8. **Medina-Bolivar F**, Cramer C. 2004. Production of recombinant proteins in hairy roots cultured in plastic sleeve bioreactors. *In:* Recombinant Gene Expression: Reviews and Protocols. P. Balbas and A. Lorence, (eds.). Humana Press, Totowa, pp 351-363.

9. Reed D, Nopo-Olazabal L, Woffenden B, Funk V, Reidy M, Cramer C, **Medina-Bolivar F.** 2004. Expression of functional hexahistidine-tagged ricin B in tobacco. Plant Cell Reports. 24:15-24

10. Zhang C, **Medina-Bolivar F**, Buswell S, Cramer C. 2005. Purification and stabilization of ricin B from tobacco hairy root cultures by aqueous two phase extraction. Journal of Biotechnology. 117:39-48

11. Buswell S., **Medina-Bolivar F**, Van Cott K, Zhang C. 2005. Expression of porcine prorelaxin in transgenic tobacco. Annals of the New York Academy of Sciencies. 1041:77-81.

12. **Medina-Bolivar F.** 2006. Rooting for new medicines. In: J. Trauth and A. Romero (eds.). Adventures in the Wild: Tales from Biologists of the Natural State. The University of Arkansas Press. pp. 83-88.

13. **Medina-Bolivar F**, Condori J, Rimando A, Hubstenberger J, Shelton K, Bennett S, Dolan M. 2007. Production and secretion of resveratrol in hairy root cultures of peanut. Phytochemistry. 68:1992-2003.

14. **Medina-Bolivar F**, Nopo-Olazabal C, Nopo-Olazabal L, Sivakumar G, Condori J. 2007. Screening for bioactives stilbenes in the genus *Nicotiana*. Recent Advances in Tobacco Science. 33:93-100.

15. Woffenden B, Nopo L, Cramer C, Dolan M, **Medina-Bolivar F**. 2008. Expression of a ricin B:F1:V fusion protein in tobacco hairy roots: steps toward a novel pneumonic plague vaccine. Electronic Journal of Integrative Biosciences. 3:10-19.

16. Pitta-Alvarez S, **Medina-Bolivar F**, Alvarez M, Scambatto A, Marconi P. 2008. *In vitro* shoot culture and antimicrobial activity of *Berberis buxifolia* Lam. In Vitro Cellular & Developmental Biology. 44:502-507.

17. Condori J, Medrano G, Sivakumar G, Nair V, Cramer C, Medina-Bolivar F. 2009. Functional characterization of a stilbene synthase gene using a transient expression *in planta*. Plant Cell Reports 28:589-599.

18. Sivakumar G, Vail D, Nair V, **Medina-Bolivar F**, Lay J. 2009. Plant-based corosolic acid: Future anti-diabetic drug? Biotechnology Journal. 4:1704-1711.

19. Sivakumar G, Christopher S, **Medina-Bolivar** F, Uccella N. 2009 Plant-based small molecules and proteins: A source for natural medicines. In: Plant Secondary Terpenoids, Eds. Javier Palazon and Rosa Cusido, Research Signpost.

20. Condori J, Sivakumar S, Hubstenberger J, Dolan MC, Sobolev VS, **Medina-Bolivar F**. 2010. Induced biosynthesis of resveratrol and the prenylated stilbenoids arachidin-1 and arachidin-3 in hairy root cultures of peanut: Effects of culture medium and growth stage. Plant Physiology and Biochemistry. 48:310-318.

21. Abbott J, **Medina-Bolivar F**, Martin E, Engelberth AS, Villagarcia H, Clausen EC, Carrier DC. 2010. Purification of resveratrol, arachidin-1 and arachidin-3 from hairy root culture of peanut (*Arachis hypogaea*) and determination of their antioxidant activity and cytotoxicity. Biotechnology Progress. 26(5):1344-1351

22. **Medina-Bolivar F**, Condori J, Nopo-Olazabal C, Carrier J, Abbott J, Nair V, Atwill R, Baker J, Nopo-Olazabal L, Dolan M. 2010. Controlled production of stilbenoids in hairy root cultures of peanut (*Arachis hypogaea*). Polyphenols Communications. 1: 42-43.

23. Joshee N, Parajuli P, **Medina-Bolivar F**, Rimando AM, Yadav AK. 2010. Scutellaria biotechnology: achievements and future prospects. Bulletin UASVM Horticulture. 67(1)/2010.

24. Sivakumar G, **Medina-Bolivar F**, Lay J, Dolan MC, Condori J, Wright SM, Baque MDA, Lee E-J, Paek KY. 2011. Bioprocess and bioreactor: Next generation technology for production of potential plant-based antidiabetic and antioxidant molecules. Current Medicinal Chemistry. 18:79-90.

25. Condori J, Nopo-Olazabal C, Medrano G, **Medina-Bolivar F**. 2011. Selection of reference genes for qPCR in hairy roots cultures of peanut. BMC Research Notes. 4:392

26. Nopo L, Woffenden B, Reed D, Buswell S, Zhang C, **Medina-Bolivar F**. 2012. Super-promoter: TEV, a powerful gene expression system for tobacco hairy roots. (In: Recombinant Gene Expression: Reviews and Protocols, Third Edition, A. Lorence (Ed.), Springer). Methods in Molecular Biology. 824:501-526.

27. Brents LK, **Medina-Bolivar F (*)**, Seely KA, Nair V, Bratton SM, Gallus-Zawada A, Ñopo-Olazabal L, Patel RY, Liu H, Doerksen RJ, Prather P, Radominska-Pandya A. 2012. Natural prenylated resveratrol analogs, arachidin-1 and -3, demonstrate an improved glucuronidation profile and have affinity for cannabinoid receptors. Xenobiotica. 42:139-156. **[*First two authors share first authorship**]

28. Prabhu P, **Medina-Bolivar F**, Condori J, Sivakumar G, Srivatsan M. 2012. Neuroprotective effect of peanut hairy root extract against oxidative stress in PC12 derived neurons. Journal of Medicinally Active Plants. 1(4):125-133.

29. Joshee N, Tascan A, **Medina-Bolivar F**, Parajuli P, Rimando AM, Shannon DA, Adelberg JW. 2013. *Scutellaria*: Biotechnology, Phytochemistry and its Potential as a Commercial Medicinal Crop. In: Biotechnology for Medicinal Plants: Micropropagation and Improvement, Eds. Suman Chandra, Hemant Lata and Ajit Varma, Springer-Verlag, Heidelberg Germany. pp. 69-99.

30. Nopo-Olazabal C, Hubstenberger J, Nopo-Olazabal L, **Medina-Bolivar F**. 2013. Antioxidant activity of selected stilbenoids and their bioproduction in hairy root cultures of muscadine grape (*Vitis rotundifolia* Michx.). Journal of Agricultural and Food Chemistry. 61(48):11744-11758.

31. Nopo-Olazabal C, Condori J, Nopo-Olazabal L, **Medina-Bolivar F.** 2014. Differential induction of antioxidant stilbenoids in hairy roots of *Vitis rotundifolia* treated with methyl jasmonate and hydrogen peroxide. Plant Physiology and Biochemistry. 74:50-69.

32. Zhai B, Clark J, Ling T, Connelly M, **Medina-Bolivar F**, Rivas F. 2014. Antimalarial evaluation of the chemical constituents of hairy root culture of *Bixa orellana*. Molecules. 19(1):756-766.

33. Marsh Z, Yang T, Nopo-Olazabal L, Wu S, Ingle T, Joshee N, **Medina-Bolivar F**. 2014. Effect of light, methyl jasmonate and cyclodextrin on production of polyphenolic compounds in hairy root cultures of *Scutellaria lateriflora.* Phytochemistry. 107:50-60.

34. Yang T, Fang L, Nopo-Olazabal C, Condori J, Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Enhanced production of resveratrol, piceatannol, arachidin-1 and arachidin-3 in hairy root cultures of peanut co-treated with methyl jasmonate and cyclodextrin. Journal of Agricultural and Food Chemistry. 63(15):3942-50.

35. Ball JM, **Medina-Bolivar F**, Defrates K, Hambleton E, Hulburt M, Fang L, Yang T, Nopo-Olazabal L, Atwill RL, Ghai P, Parr RD. 2015. Investigation of stilbenoids as potential therapeutic agents for rotavirus infections. Advances in Virology. doi: 10.1155/2015/293524.

36. Condori J, **Medina-Bolivar F**. 2016. Perspectives of peanut phytoalexins: biosynthesis, bioproduction and their applications in human health. In: Peanut bioactives and allergens. Eds. Alice Lee, Rao Rachaputi and Graeme Wright. DES*tech* Publications, Lancaster, USA. 47-81 pp.

37. Yang T, Fang L, Rimando A, Sobolev V, Mockaitis K, **Medina-Bolivar**. 2016. A stilbenoid-specific prenyltransferase utilizes dimethylallyl pyrophosphate from the plastidic terpenoid pathway. Plant Physiology. 171: 2483-2498.

38. Gershlak J, Hernandez S, Fontana G, Perreault L, Hansen K, Binder B, Larson S, Yang T, Dominko T, Rolle M, Weathers P, **Medina-Bolivar F**, Cramer C, Murph W, Gaudette G. 2017. Crossing kingdoms: Exploiting decellularized plants as pre-vascularized scaffolds for tissue engineering. Biomaterials. 125: 13-22.

39. Yang T, Fang L, **Medina-Bolivar F.** 2017. Biosynthesis and bioproduction of bioactive stilbenoids in hairy root cultures. In: Production of plant derived natural compounds through hairy root culture. Ed. Sonia Malik. Springer, Cham. pp. 45-64.

40. Yang T, Fang L, Sanders S, Jayanthi S, Rajan G, Podicheti R, Thallapuranam SK, Mockaitis K, **Medina-Bolivar F**. 2018. Stilbenoid prenyltransferases define key steps in the diversification of peanut stilbenoids. Journal of Biological Chemistry. 293: 28-46.

41. Witcher CM, Napier-Jameson R, Lockwood HN, Mattila MN, Wisdom SB, Saade Ferreira LL, Taylor J, Clack B, **Medina-Bolivar F**, Ball JM, Parr RD. 2019. Arachidin-1 and arachidin-3 modulation of rotavirus-infected MA104 cells. Journal of the American Council for Medicinally Active Plants. 8 (1): 1-19.

42. Fang L, Yang T (*), **Medina-Bolivar F**. 2020. Production of prenylated stilbenoids in hairy root cultures of peanut (*Arachis hypogaea*) and its wild relatives *A. ipaensis* and *A. duranensis* via an optimized elicitation procedure. Molecules. 25(3):509. doi: 10.3390/molecules25030509. (*; First two authors share first authorship)

43. Gajurel G, Hasan R, **Medina-Bolivar F**. 2021. Antioxidant assessment of prenylated stilbenoid-rich extracts from elicited hairy root cultures of three cultivars of peanut (*Arachis hypogaea*). Molecules. 26(22): 6778. https://doi.org/10.3390/molecules26226778.

44. Mohammadhosseinpour S, Ho L-C, Fang L, Xu J, Medina-Bolivar F. 2022. Arachidin-1, a prenylated stilbenoid from peanut, induces apoptosis in triple-negative breast cancer cells. International Journal of Molecular Sciences. 23, 1139. https://doi.org/10.3390/ijms23031139.

45. Gajurel G, Nopo-Olazabal L, Hendrix E, Medina-Bolivar F. 2022. Production and secretion of isowighteone acid in hairy root cultures of pigeon pea (*Cajanus cajan*) co-treated with multiple elicitors. Plants. 11(6):834. https://doi.org/10.3390/plants11060834.

46. Sharma A, Gajurel G, Ahmed I, Roedel K, **Medina-Bolivar F.** 2022. Induction of the prenylated stilbenoids arachidin-1 and arachidin-3 and their semi-preparative separation and purification from hairy root cultures of peanut (*Arachis hypogaea*). Molecules. 27(18):6118. https://doi.org/10.3390/molecules27186118.

46. Fang L, Sharma AR, Aniemena C, Roedel K, Henry F, Moussou P, Samuga A, **Medina-Bolivar F**. 2022. Elicitation of stilbenes and benzofuran derivatives in hairy root cultures of white mulberry (*Morus alba*). Plants. 12 (1):175. https://doi.org/10.3390/plants12010175.

47. Mohammadhosseinpour S, Weaver A, Sudhakaran M, Ho L-C, Le T, Doseff A, **Medina-Bolivar F**. 2023. Arachidin-1, a prenylated stilbenoid from peanut, enhances the anticancer effects of paclitaxel in triple-negative breast cancer cells. Cancers. 15, 399. https://doi.org/10.3390/cancers15020399.

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48. Reed KB, Pruitt E, KC HR, Sharma AR, **Medina-Bolivar F**, Shields RC. 2024. Effect of peanut stilbenoids, arachidin-1 and arachidin-3, on *Streptococcus mutans* growth and acid production. Natural Product Research, 1–9. https://doi.org/10.1080/14786419.2024.2302316.

49. Gajurel G, Hasan R, Medina-Bolivar F. 2024. Water-deficit stress induces prenylated stilbenoid production and affects biomass in peanut hairy roots: Exploring the role of stilbenoid prenyltransferase downregulation. Plant Physiology and Biochemistry: PPB, 210, 108596. https://doi.org/10.1016/j.plaphy.2024.108596.

50. Mohammadhosseinpour S, Weaver A, Hernandez-Madrigal S, Gajurel G, Sharma AR, **Medina-Bolivar F**. 2024. Stilbene-rich extract increases the cytotoxic effects of paclitaxel in hormone receptor-positive and triple-negative breast cancer spheroids. Phytomedicine Plus. 4 (3):100578. https://doi.org/10.1016/j.phyplu.2024.100578

Patents:

Medina-Bolivar F, Dolan M, Bennett S, Condori J, Hubstenberger J. "Production of stilbenes in hairy roots".

US Patent No. 7666677 (issued February 23, 2010)

European Patent Application No. 07799286.5 (March 2009; International Patent Application No. PCT/US07/72756)

Medina-Bolivar F, Dolan M. "Production of stilbenes in plant hairy root cultures and other root

cultures”
US Continuation-in-part Patent Application (filed 2009)

Radominska-Pandya F, Prather P, **Medina-Bolivar F**, Mayeux P. “Stilbenoid derivatives and their uses.
US Patent Application No. 13/339,163 (filed December 28, 2011)
US Continuation Patent Application No. 14721551 (filed May 26, 2015)
US Patent No. 9095598 B2 (issued August 4, 2015)

Medina-Bolivar F, Yang T. “Method to increase the yield of products in plant material".
US Provisional Patent Application No. 61729659 (filed November 26, 2012)
US Patent Application No. 13784877 (filed on March 5, 2013)
US Patent No. 9,598,707 B2 (Issued March 31, 2017)
European Patent No. EP2735609A2 (Issued August 16, 2017)
Continuation in Part US Patent No. 10,144,913 (Issued December 4, 2018)

Medina-Bolivar F, Parr R. “Therapeutic applications of prenylated stilbenoids against rotavirus infections”
US Patent Application No. 15/091,758 (filed April 6, 2016)
PCT Application No. PCT/US16/26346 (filed April 6, 2016)

Murphy W, Fontana G, Jershlak J, Gaudette G, Weathers P, Dominko T, Rolle M, Hernandez S, Cramer C, **Medina-Bolivar F**. 2017. Functionalization of plant tissues for human cell expansion.
US Patent Application No. 16/085220 (filed March 14, 2017)
US Continuation Patent Application No. 17/388652 (filed July 29, 2021)

Medina-Bolivar F, Yang T, Mockaitis T. “Stilbenoid prenyltransferases from plants".
US Provisional Patent Application (filed June 16, 2016)
US Patent Application No. 15/625,450 (filed June 16, 2017)
US Patent No. 10,704,052 (issued July 7, 2020)
US Continuation Application (filed July 6, 2020)
US Continuation Patent No. 11535856-B2 (issued December 27, 2022)

Medina-Bolivar F, Fang L, Sharma A, Henry F, Moussou P, Samuga A. “Botanical compositions and methods of production and use thereof”
US Provisional Patent Application (filed September 9, 2022)
US Patent (submitted September 8, 2023)

Gene Registers:

Condori J, **Medina-Bolivar F.** 2006. *Agrobacterium rhizogenes* strain ATCC 15834 plasmid pRi 15834 3-indoleacetamide hydrolase (*aux2*) and trytophan 2-monooxygenase (*aux1*) genes, complete cds. Accession DQ782955. Published Aug 20, 2006.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* cultivar Andru II chalcone synthase gene, complete cds. NCBI Accession EU418492. Published online 12 Feb 2008.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* cultivar Andru II resveratrol synthase gene, complete cds. NCBI Accession EU384706. Published online 4 Feb 2008.

Condori J, **Medina-Bolivar F**. Binary vector pBIB-Kan, complete sequence. NCBI Accession GU982971. Published online 30 Mar 2010.

Condori J, **Medina-Bolivar F**. Binary vector pBIB-Hyg, complete sequence. NCBI Accession JX625145. Published online 31 Oct 2012.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* clone JC2 putative stilbene synthase gene, complete cds. NCBI Accession KF241168. Published online 1 Jan 2014.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* clone 05_08E putative stilbene synthase mRNA, partial cds. NCBI Accession KF241167. Published online 1 Jan 2014.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* clone 04_07D putative stilbene synthase mRNA, partial cds. NCBI Accession KF241166. Published online 1 Jan 2014.

Condori J, **Medina-Bolivar F**. *Arachis hypogaea* clone 03_11D putative stilbene synthase mRNA, partial cds. NCBI Accession KF241164. Published online 1 Jan 2014.

Condori J, **Medina-Bolivar F.** UNVERIFIED: *Arachis hypogaea* clone 04_06E putative stilbene synthase-like mRNA, partial sequence. NCBI Accession KF241165. Published online 1 Jan 2014.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull putative prenyltransferase (PT-9i2) mRNA, complete cds. 1,218 bp. NCBI Accesion KY565249.1. Published online 1 March 2018.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull putative prenyltransferase (RPT-10d4) mRNA, complete cds. 1,296 bp linear mRNA. NCBI Accession MG725680.1. Published online 10 January 2018.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull putative prenyltransferase (RPT-10a4) mRNA, complete cds. 1,332 bp linear mRNA. NCBI Accession MG725679.1. Published online 10 January 2018.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull resveratrol 3'-dimethylallyltransferase (R3'DT-4) mRNA, complete cds. 1,197 bp linear mRNA. NCBI Accession KY565248.1. Published online 27 November 2017.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull resveratrol 3'-dimethylallyltransferase (R3'DT-3) mRNA, complete cds. 1,218 bp linear mRNA. NCBI Accession KY565247.1. Published online 27 November 2017.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull resveratrol 3'-dimethylallyltransferase (R3'DT-2) mRNA, complete cds. 1,170 bp linear mRNA. NCBI Accession KY565246.1. Published online 27 November 2017.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull resveratrol 3'-dimethylallyltransferase (R3'DT-1) mRNA, complete cds. 1,191 bp linear mRNA. NCBI Accession KY565245.1. Published online 27 November 2017.

Medina-Bolivar F, Yang T, Mockaitis K. *Arachis hypogaea* cultivar Hull resveratrol 4-dimethylallyltransferase (R4DT-1) mRNA, complete cds. 1,245 bp linear mRNA. NCBI Accession KY565244.1. Published online 27 November 2017.

Articles and Videos:

Medina-Bolivar F. *Plant roots offer pharmaceutical potential*. Jonesboro Sun. Oct 15, 2005
(I recorded a radio interview following this article, Oct 27, 2005)

Medina-Bolivar F. *From "hairy roots" to pharmaceutical drugs: a tale of metabolic engineering.* 2005 ASU Foundation Annual Report.

Medina-Bolivar F. *Rooting for resveratrol*. 2006 Annual Report of the Arkansas Biosciences Institute.

Medina-Bolivar F. 2007. *ASU scientists find source for anti-aging compound.* Jonesboro Sun. April 22, 2007

Medina-Bolivar F. 2011. Why Plant Research? MeASUre. The Research Publication of Arkansas State University. Article and YouTube video highlights Medina-Bolivar's research.

Medina-Bolivar F. 2012. *3rd Annual Conference of the American Council for Medicinally Active Plants*. YouTube video highlighting the Arkansas Biosciences Institute and the conference at Arkansas State University. The event was organized and chaired by F. Medina-Bolivar.
http://www.youtube.com/watch?v=9VEwO6fYCgQ

Medina-Bolivar F. 2013. Stilbenoid symphony. YouTube video focusing on the research of Dr. Medina-Bolivar. This video also features his piano composition.
http://www.youtube.com/watch?v=sm6_p6DBJRg

Medina-Bolivar F. 2013. Arkansas ASSET's Special Hispanic Heritage Tribute Publication. This issue highlights the research profile of Dr. Medina-Bolivar.

Medina-Bolivar F. 2017. TEDx talk. Peanut and Piano: How great things can results from a little stress. Arkansas State University. https://www.youtube.com/watch?v=cCO9BTRjLEA

Medina-Bolivar F, Ho L-C. 2020. Ep 80 Create@State Podcast Features Plant Research. https://cpa.ds.npr.org/kasu/audio/2020/03/create_state_podcast_3-26-20.mp3?dl=1&siteplayer=true&dl=1

Medina-Bolivar F. 2020. Virtual Accelerator Puts Early-Stage Companies on Path to SBIR/STTR Success
http://asbtdc.org/virtual-accelerator-puts-early-stage-companies-on-path-to-sbir-sttr-success/

Medina-Bolivar F. 2021. Arkansas Research Alliance adds Eight to its Ranks
https://talkbusiness.net/2021/04/arkansas-research-alliance-adds-eight-to-its-ranks/
April 6, 2021

Medina-Bolivar F. 2021. ARA Adds Eight Researchers to Growing Academy of Scholars and Fellows
https://armoneyandpolitics.com/ara-adds-eight-researchers-to-growing-academy-of-scholars-and-fellows/R
April 6, 2021

Medina-Bolivar F. 2021. Fabricio Medina-Bolivar selected for Arkansas Research Alliance Fellows Program
https://www.astate.eduar news/fabricio-medina-bolivar-selected-for-arkansas-research-alliance-fellows-program
April 6, 2021

Medina-Bolivar F. 2021. Arkansas Research Alliance adds 8 Members
https://www.arkansasonline.com/news/2021/apr/11/arkansas-research-alliance-adds-8-members-2-have/
April 11, 2021

Medina-Bolivar F. 2022. How Arkansas Leads Research of Plant-Based Cancer Treatments. Arkansas Money & Politics
https://www.armoneyandpolitics.com/author/fabriciomedinabolivar/
October 10, 2022

Medina-Bolivar F. 2024.
Four inducted into first Arkansas Latino Hall of Fame | The Arkansas Democrat-Gazette - Arkansas' Best News Source
October 26, 2024

Medina-Bolivar F. 2024
https://www.pressreader.com/usa/arkansas-democrat-gazette/20241025/281900188695414
October 25, 2024

RESEARCH SUPPORT

Funded Grant Proposals:

Medina-Bolivar F (PI)
"Metabolic engineering for the overproduction of medicinal phytochemicals"
Arkansas Biosciences Institute
$ 200,000
07/01/05-6/30/08

Medina-Bolivar F (PI)**,** Grippo A.
"Effects of resveratrol-containing extracts from peanut hairy roots on human leukemia cells"
Arkansas State University, Undergraduate Research Proposal
$ 1,000
07/01/06-12/31/06

Medina-Bolivar F (PI)
"Advanced training in HPTLC techniques for phytochemical analyses"
Arkansas State University/Eleanor Lane Travel Award
$ 750
Sep 2006

Lorence A, **Medina-Bolivar F** (Co-PI)**,** Redeker K.
"Collaborative Seed Grant: Mechanisms of Toxicity and Remediation of Superfund Environmental Toxicants"
Arkansas Biosciences Institute at Arkansas State University
$ 34,500
07/01/06-06/30/08

Medina-Bolivar F (PI)
"Development of Transgenic Sorghum Root Cultures for Production of Herbicides"
Arkansas State University
$ 7,000
07/01/06-06/30/07

Gilbert K (AR Children's Hospital Research Institute), Blossom S, Przyyla B, Pumford N, Fuscoe J, **Medina-Bolivar F**, Redeker K, Lorence A
"Developing an immunotoxicology center in Arkansas"
Arkansas Biosciences Institute at Arkansas Children's Hospital Research Institute
$ 200,000 (*Note:* funding provided to AR Children's Hospital Res. Inst.)
07/01/07-06/30/08

Nirmal J (Fort Valley State Univ.), Prahlad P (Karmanos Cancer Inst. at Wayne State Univ.), **Medina-Bolivar F** (Co-PI, ASU), Shannon D. (Auburn Univ.), Ellis B. (USDA), Rimando A (USDA)
"Scutellaria as a medicinal crop: Cryopreservation, hairy root culture, organic farming and anticancer activity"
United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), 1890 Capacity Building Grant, National Competitive Proposal
$ 434,258
10/01/08-09/30/11

Medina-Bolivar F (PI), Carrier J (Univ. of Arkansas, Fayetteville), Dolan M.
"Regulation, production and purification of bioactive stilbenoids from hairy root cultures of peanut"
National Science Foundation, EPSCoR-P3 Center for Plant-Powered Production Competitive Proposal
$ 248,250
05/16/08-11/15/09

Gilbert K, Lorence A, **Medina-Bolivar F** (Co-PI), Cramer C.
Phytoremediation of trichloroethylene
Arkansas Children's Hospital Research Institute
$ 180,000
07/01/08-06/30/10

Khodakovskaya M (PI, UALR), **Medina-Bolivar F** (Co-PI, ASU).
"Enhancing abiotic stress tolerance and production of antioxidant in plants for Advanced Life Support in Space Exploration".
Arkansas Space Grant Consortium
$ 45,000
04/15/08-4/14/11

Khodakovskaya M (PI, UALR), Grace S (Co-PI, UALR), Ali N (Co-PI, UALR), **Medina-Bolivar F** (Co-PI, ASU).
"Regulation of secondary metabolism in tomato by genetic manipulation of the phosphoinositol pathway".
NSF-EPSCoR P3
$ 149,928
04/01/09-3/31/10

Hannigan R (PI), Buchanan R (Co-PI), Cramer C (Mentor), Dolan M (Mentor), Bouldin J (Mentor), Christian A (Mentor), Lorence A. (Mentor), **Medina-Bolivar F** (Mentor), Anh S (Mentor), Green S (Mentor), Dowling C (Mentor), Phillips G (Mentor), Young N (Mentor)
"Undergraduate Research and Mentoring in the Biological Sciences: Cross-disciplinary Research at the Intersection of Biotechnology and the Environment"
National Science Foundation
$ 1,112,685

01/15/08-12/15/13
Note: **Dr. Medina-Bolivar** was in charge of writing the Metabolite Identification section; Project 4, subproject 1 ("Development of chemical markers for black cohosh")

Cramer C (PI), Thompson G, Korth K
Note: This proposal includes 21 scientists. Dr. **F. Medina-Bolivar** was involved in writing Objective II/Project 2 ("Manipulating of the terpenoid pathway for discovery and bioproduction of valuable phytochemicals in hairy roots") and Objective III/Objective 2/Aim 2 ("Elicitation as a gene discovery tool for master regulators of terpenoid biosynthesis in hairy roots").
"Arkansas ASSET Initiative" – Plant Bioproduction Project
National Science Foundation EPSCoR Research Infrastructure Improvement Program
$ 9,000,000
05/01/07-04/30/10

Medina-Bolivar F (PI)
"Root cultures of *Veratrum californicum* as a sustainable source of cyclopamine and related steroidal alkaloids" – Feasibility Study
Infinity Pharmaceuticals
3/13/11-3/13/12
$ 72,271

Medina-Bolivar F (PI)
"Root cultures of *Veratrum californicum* as a sustainable source of cyclopamine and related steroidal alkaloids"
Infinity Pharmaceuticals
3/13/12-3/13/13
$ 215,659

Nirmal J (Fort Valley State Univ.), Prahlad P (Karmanos Cancer Inst. at Wayne State Univ.), **Medina-Bolivar F** (Co-PI, ASU), Ellis D. (USDA), Rimando A (USDA-ARS)
"Germplasm conservation, anti-adipocytic and anticancer activity, and metabolic engineering in the genus *Scutellaria*"
United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), 1890 Capacity Building Grant, National Competitive Proposal
$ 455,589
09/01/11-08/31/14

Atwill R (student), **Medina-Bolivar F** (PI; advisor)
"Production of resveratrol and its prenylated analogs in 1 liter peanut hairy root cultures and their purification using high performance counter current chromatography".
Arkansas Department of Higher Education; Student Undergraduate Research Fund (SURF)
$ 2,750
01/01/12-04/30/12

Marsh Z (student), **Medina-Bolivar F** (PI; advisor)

"Development of root cultures of *Veratrum californicum* for sustainable production of the antitumor alkaloid cyclopamine"
Arkansas Department of Higher Education; Student Undergraduate Research Fund (SURF)
$ 4,000
01/01/12-12/31/12

Ogutu L (student). **Medina-Bolivar F** (PI; advisor)
"Biosynthesis enhancement and neuroprotective activity of stilbenoids from hairy root cultures of peanut"
Arkansas State University; Student Undergraduate Research Fund (SURF)
$ 2,750
01/01/13-04/30/13

Ogutu T (student), **Medina-Bolivar F** (Co-PI), Compadre C (PI)
"Characterization of tocotrienols in hairy root cultures of annatto"
ASTA
2013 UAMS/AState Summer Internship

Medina-Bolivar (PI)
A transcriptomic approach to elucidate the biosynthesis of stilbenoids in peanut
P3 Center Next-Gen Sequencing Pilot Award
$ 1,670

Medina-Bolivar (PI), Mockaitis K (Co-PI; University of Indiana)
"Elucidating the biosynthesis of stilbenoids in peanut"
USDA-AFRI
$ 138,513
12/15/13-12/14/15

Savary (PI), **Medina-Bolivar** (Co-PI), Xu (Co-PI), Lee (Co-PI; University of Arkansas), "Development of separations chemistry to isolate and identify bioactive components in rice bran fractions for characterizing their colon-promoting benefits"
P3
$ 83,980
8/1/14-6/30/15

Creameans (student); **Medina-Bolivar** (PI)
"Production of tocotrienols in hairy root cultures of annatto"
ASSET
1/22/15-9/19/15
$ 6,000

Creameans (student); **Medina-Bolivar** (PI)
"Production of bioactive compounds in hairy root cultures of annatto"
College of Sciences and Mathematics, A-State
1/15/15-8/15/15

$ 2,750

Tollett (student); **Medina-Bolivar** (PI)
"Bioproduction of stilbenoids in peanut hairy root cultures and their purification by high performance counter current chromatography"
College of Sciences and Mathematics/SURF, A-State
1/15/15-8/15/15
$ 2,750

Knapp (student); **Medina-Bolivar** (PI)
"Production of stilbenoids in hairy root cultures of muscadine grape: Effect of methyl jasmonate and cyclodextrin"
SURF, State of Arkansas
1/22/15-9/19/15
$ 2,125

Savary (PI), **Medina-Bolivar** (Co-PI), Xu (Co-PI), Lee (Co-PI; University of Arkansas), "Development of separations chemistry to isolate and identify bioactive components in rice bran fractions for characterizing their colon-promoting benefits"
P3
$ 83,980
8/1/14-6/30/15
Medina-Bolivar (PI)
"Bioproduction and metabolic engineering of prenylated stilbenoids in hairy roots"
Advanced Institute for Research Development. A-State
$ ~ 1,500

Medina-Bolivar (PI)
Provost's Faculty Development Award, A-State
$ ~ 1,400

Savary (PI), **Medina-Bolivar** (Co-PI), Xu (Co-PI)
Preparation and Analysis of Feruloylated Arabinoxylan Oligosaccharides from Rice Bran to Establish their Colon-Health Promoting Benefits
Arkansas Biosciences Institute
7/01/15-6/30/17
$ 95,938

Medina-Bolivar (PI)
"Innovative plant products for the prevention and treatment of obesity"
Arkansas Biosciences Institute
$ 99,452
7/01/15-6/30/17

Lee (student); **Medina-Bolivar** (PI)
"Hairy roots as potential scaffolds for mammalian cell cultures"
SURF, State of Arkansas
1/15/16-9/15/16
$ 2,125

Medina-Bolivar (PI)
"Prenylated stilbenoids as chemopreventive and therapeutic agents for breast cancer"
Arkansas Biosciences Institute
1/1/17-6/30/18
$ 59,497

Medina-Bolivar (PI)
Tailoring plant metabolism for the production of arachidin-2: A bioactive with multiple applications in human health.
Arkansas Biosciences Institute
7/01/18-6/30/20
$99,886

Medina-Bolivar (PI)
Dissecting the anti-Inflammatory cell signaling mechanisms mediated by prenylated stilbenoids in THP-1 cells
IDeA Network of Biomedical Research Excellence (INBRE)
1/1/19-6/30/19
$6,510

Medina-Bolivar (PI)
Bioproduction and purification of prenylated stilbenoids from hairy roots.
Nature West Inc.
7/1/19-6/30/20 - $42,576
7/1/20-6/30/22 - $48,876

Medina-Bolivar (PI); Rajagopalan (Co-PI)
Assessing the cardioprotective properties of prenylated stilbenoids in vitro and in vivo
Arkansas Biosciences Institute
7/01/20-6/30/21 - $35,000
7/01/21-6/30/22 - $35,000

Medina-Bolivar (PI)
Establishment of hairy root cultures of *Morus alba* and elicitation of specialized metabolites
BASF
9/04-20-6/30/21 - $307,304

Medina-Bolivar (PI)

Arkansas Research Alliance Fellow 2021
Arkansas Research Alliance
5/1/21-4/30/24
$75,000

Medina-Bolivar (PI)
Summer manuscript support: Arachidin-1
INBRE
5/2/21-7/30/21
$9,087

Alam (PI), Ali (Co-PI), **Medina-Bolivar** (Co-PI), Hershberger (Co-PI), Ontko (Co-PI)
MRI: Acquisition of a 400 MHz nuclear magnetic resonance (NMR) for research at Arkansas State University
NSF
8/01/21-7/31/24
$345,935

Arun (PI), Joshee (Collaborator), **Medina-Bolivar** (Collaborator), Reddy (Collaborator)
Revamping agricultural biotechnology education in Puerto Rico by empowering K-14 Teachers
USDA
11/15/21-11/14/25
$500,000

Boyd (PI), Lorence (Collaborator), **Medina-Bolivar** (Collaborator); Ali (Collaborator); Newman-Lee (Collaborator)
Diversifying our curing community: A program to increase the number of minority physicians in Arkansas
Blue & You Foundation
1/1/22-12/15/22
$128,720

Wijeratne (PI), Robertson (Co-PI), **Medina-Bolivar** (Co-PI)
Effect of DNA methylation on soybean- *Phytopthora sojae* interactions
USDA
5/1/22-4/30/25
$300,000

Medina-Bolivar (PI)
Arachidin-1 enhances the anticancer effects of paclitaxel in triple-negative breast cancer cells
INBRE
6/1/22-7/31/22
$15,402

Medina-Bolivar (PI)
Summer manuscript support: Stilbene-rich extract increases the cytotoxic effects of paclitaxel in hormone receptor-positive and triple-negative breast cancer spheroids

INBRE
6/1/23-7/31/23
$22,017

Williams, L (PI), Lorence A (Collaborator), **Medina-Bolivar F** (Collaborator); Ali H (Collaborator); Newman-Lee L (Collaborator)
Blue & You Foundation
Diversifying our curing community: A program to increase the number of minority physicians in Arkansas
1/1/23-12/15/23
$136,250

Weaver (student), **Medina-Bolivar** (PI)
SURF-Alex Weaver: Exploring the role of cannabinoid receptor 1 & 2 on the anticancer mechanism of prenylated stilbenoids on triple-negative breast cancer.
1/1/23-4/30/23
$2,750

<u>Funded Grant Proposals From Previous Appointment (at Virginia Tech):</u>

Cramer C (BioDefense Technologies, PI), **Medina-Bolivar F** (Virginia Tech, PI), Dolan M.
"Nasally-delivered mucosal vaccine for plague"
Sub-Contract from NIH/Small Business Technology Transfer (STTR) national competitive grant (STTR, R41 AI 52958-01) to BioDefense Technologies, Inc.
$ 108,121 (to Medina-Bolivar)
1/1/03-12/31/03

Petri Jr. W (Univ. of Virginia), Buck G. (VA Commonwealth Univ.), Nessler C. (VA Tech)
"The Virginia Consortium for Mucosal Therapy of Infectious and Autoimmune Diseases"
State of Virginia, Commonwealth Technology Research Fund
$ 3.6 Million ($ 1.2 Million to Medina-Bolivar)
1/1/02-5/30/05
Note: Dr. **Medina-Bolivar** participated in writing part of this proposal. He was appointed as Research Director for the Virginia Tech component of this project.

Medina-Bolivar (PI)
"Hairy root cultures as bioproduction systems for metabolites produced in tobacco leaf and smoke"
(Subcontract from grant "On the presence of monoamine oxidase inhibitors in tobacco and tobacco smoke"awarded to N. Castagnoli, PI, Dept. of Chemistry, Virginia Tech)
Phillip Morris
09/01/03-12/31/04

PRESENTATIONS

1992

1. **Medina-Bolivar F,** Flores H. 1992. Selection of high alkaloid-producing "hairy root" clones of *Hyoscyamus muticus*. International Symposium in the Molecular Genetics of Root Development. New York City, NY. (poster)

2. **Medina-Bolivar F,** Dodds J. 1992. Efficient shoot organogenesis from leaves, roots and internodes of sweet potato. Annual Meeting American Society of Plant Physiologists. Pittsburg, PA (poster; Plant Physiology. Abstract 99: 49)

3. **Medina-Bolivar F**, Dodds J. 1992. Development of plant regeneration and transformation systems in sweet potato (*Ipomoea batatas*). Congress on In Vitro Biology. Arlington, VA. (poster)

4. Lowe J, Newell C, Buitron F, **Medina-Bolivar F,** Dodds J. 1992. Development of plant regeneration and transformation systems in sweet potato (*Ipomoea batatas*). Congress on In Vitro Biology. Arlington, VA. [poster; In Vitro Cellular and Developmental Biology. Abstract 28:121A]

1993

5. **Medina-Bolivar, F.** and H. Flores. 1993. A novel approach for tropane alkaloid overproduction from hairy roots of *Hyoscyamus muticus*. Annual Meeting American Society of Plant Physiologists. Minneapolis, MN [Plant Physiology. Abstract 102:98]

6. **Medina-Bolivar, F.** and H. Flores. 1993. Genetic engineering of secondary metabolites. New method for hyoscyamine overproduction from hairy roots. Phytochemical Society of North America. Monterey, CA.

1994

7. **Medina-Bolivar, F.** and H. Flores. 1994. Biochemical manipulations of constitutive and inducible secondary metabolites in hairy roots of *Hyoscyamus muticus*. Phytochemical Society of North America, Mexico City, Mexico.

8. **Medina-Bolivar, F.**, Gruver, M. and H. Flores. 1994. Regulation of constitutive and inducible metabolites in hairy root cultures of *Hyoscyamus muticus*. Annual Meeting American Society of Plant Physiologists. [Plant Physiology. Abstract 105: 89]

9. **Medina-Bolivar, F.** and H. Flores. 1994. Biochemical manipulations to increase alkaloid production in hairy roots. First Annual Industry Liaison Days Research Exhibition. State College, PA.

1995

10. **Medina-Bolivar, F.** and H. Flores. 1995. Studies on the manipulation of tropane alkaloid biosynthesis in hairy roots of *Hyoscyamus muticus*. 10th Annual Penn State Symposium in Plant Physiology. State College, PA

1997

11. **Medina-Bolivar, F.** and H. Flores. 1997. Metabolic engineering of the sesquiterpene pathway in hairy roots of *H. muticus*. Annual Meeting American Society of Plant Physiologists. [Plant Physiology. Abstract 114(3): 150]

12. **Medina-Bolivar, F.** and H. Flores. 1997. Regulation of tropane alkaloid vs. sesquiterpene biosynthesis in hairy root cultures of *Hyoscyamus muticus*. 12th Annual Penn State Symposium in Plant Physiology. State College, PA.

13. **Medina-Bolivar, F.** and H. Flores. 1997. Tropane alkaloid vs. sesquiterpene biosynthesis in hairy roots of *Hyoscyamus muticus*. Annual Meeting American Society of Plant Physiologists. Plant Physiology. Abstract 114(3): 232.

1998

14. **Medina-Bolivar, F.**, Lang, S., Denbow, C. and C. Cramer. 1998. Compartmentalization of the isoprenoid pathway: Channelling metabolites for sterol vs. phytoalexin biosynthesis. Keystone Symposium in Plant Cell and Molecular Biology. Taos, NM.

15. **Medina-Bolivar, F.**, Lang, S., Denbow, C. and C. Cramer. 1998 Metabolic engineering of the isoprenoid pathway. Southern Section - American Society of Plant Physiologists. Roanoke, VA.

16. Rohrbaugh, A., **Medina-Bolivar, F.** and C. Cramer. 1998. Does glycosylation play a role in HMG2 localization? Southern Section - American Society of Plant Physiologists. Roanoke, VA.

1999

17. **Medina-Bolivar, F**. and C. Cramer. 1999. Constitutive expression of tomato *hmg2* in tobacco accelerates production of sesquiterpene phytoalexins associated with enhanced disease resistance. Annual Meeting American Society of Plant Physiologists. Baltimore, MD. (Plant Physiology, Abstract. 120S: 101)

18. Denbow, C., Daniel, A., **Medina-Bolivar, F.** and C. Cramer. 1999. Mutation of a potential ER retrieval signal in 3-hydroxy-3-methylglutaryl coenzyme A reductase and its effects on localization in Xanthi tobacco cells. Annual Meeting American Society of Plant Physiologists. Baltimore, MD (Plant Physiology, Abstract 120S: 86)

19. Medina-Bolivar, F. and C. Cramer. 1999. "Hairy roots" a tool for metabolic engineering. Congress on In Vitro Biology. New Orleans, LA. June 5-9, 1999. [In Vitro Cellular & Developmental Biology, Abstract 35(3): 38-A]

20. Ni, H., McCarthy, A., **Medina-Bolivar, F.**, Grabau, E. and C. Cramer. 1999. Production of human protein C in root cultures of transgenic tobacco. Congress on In Vitro Biology. New Orleans, LA. June 5-9, 1999. [In Vitro Cellular & Developmental Biology. Abstract 35(3): 48-A]

2000

21. Medina-Bolivar, F., Verbiest, L., Sentz., D., Barroso, L., Cramer, C. and T. Wilkins. 2000. Plant-based vaccine development: Ricin B–GFP as a model for adjuvant antigen production. Sixth International Congress of Plant Molecular Biology. Quebec City, Canada. June 18-24, 2000.

22. Denbow, C., **Medina-Bolivar, F.** and C. Cramer. 2000 Mutation of an ER targeting sequence alters subcellular localization of HMGR. Sixth International Congress of Plant Molecular Biology. Quebec City, Canada. June 18-24, 2000.

23. Medina-Bolivar, F., Sentz, D., Verbiest, L., Petri Jr., W., Wilkins, T., Cramer, C. Strategies for developing a co-expressed adjuvant for pant-based vaccine bioproduction. International Centers for Tropical Disease Research, National Institutes of Health. Bethesda, MD.

2001

24. Stroup, S., Kumar, S., **Medina-Bolivar, F.**, Cramer, C., Timko, M. and C. Cramer. 2001. Expression of Gal/GalNAc lectin of *Entamoeba histolytica* in transgenic plants. International Centers for Tropical Disease Research, National Institutes of Health. Bethesda, MD. May 7-9, 2001. (Abstract)

25. Medina-Bolivar, F., Wright, R., Sentz., D., Petri Jr., W., Wilkins, T. and C. Cramer. Plant-based mucosal vaccines. International Centers for Tropical Disease Research, National Institutes of Health. Bethesda, MD. May 7-9, 2001. (Abstract)

26. Medina-Bolivar, F., Wright, R., Sentz, D., Petri Jr., W., Wilkins, T. and C. Cramer. 2001. Ricin B-GFP: A model for plant-based mucosal vaccines Congress on In Vitro Biology. St. Louis, MS. June 16–20, 2001. (Abstract)

27. Denbow, C., **Medina-Bolivar, F.** and C. Cramer. 2001. Retention of tomato 3-hydroxy-methylglutaryl CoA reductase within the endoplasmic reticulum is controlled by an N-terminal arginine motif. Plant Biology 2001 Annual Meeting. Providence, RI. July 21-25, 2001. (Abstract 45).

28. Medina-Bolivar, F., Wright, R., Sentz, D., Petri Jr., W., Wilkins, T. and Cramer, C. 2001. An adjuvant-antigen model for plant-based mucosal vaccine production. IV Annual Congress in Vaccine Research. Arlington, VA. (Abstract)

2002

29. Zhang, C., **Medina-Bolivar, F.** and C. Cramer. 2002. Purification of ricin B from hairy root culture medium by aqueous two-phase extraction." Annual Meeting of the American Institute of Chemical Engineers. Indianapolis, IN.

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2006

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60. Medina-Bolivar, F. 2006. Production of resveratrol in hairy roots. Universidad Peruana Cayetano Heredia. Lima, **PERU**. December 22, 2006 (invited talk)

2007

61. Medina-Bolivar, F. 2007. Hairy roots as chemical factories: Rooting for resveratrol. University of Arkansas at Little Rock. Little Rock, AR. January 29, 2007. (invited talk)

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63. Simeon, S., Hannigan, R., **Medina-Bolivar, F.,** Martinez-Quintana, J., Lorence, A. 2007. HPTLC method for simultaneous cellular redox and energy state determination of plant samples. 58th Pittsburg Conference on Analytical Chemistry and Applied Spectroscopy. Chicago, IL. Feb 25-Mar 2. (poster)

64. Medina-Bolivar, F. 2007. Hairy roots: novel approaches for the production of specialized metabolites and proteins. International Symposium on Medicinal and Nutraceutical Plants, Fort Valley, GA. Mar 21. (invited talk)

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69. Spulecki, S., Condori, J., Shelton, K., Nopo-Olazabal, L., Grippo, A., **Medina-Bolivar, F.** 2007. Resveratrol and resveratrol derivatives produced from peanut hairy roots. 21st National Conference on Undergraduate Research (NCUR), San Rafael, CA, April 12-14. (poster)

70. Cramer, C., Dolan, M., Lorence, A., **Medina-Bolivar, F.**, Weathers, P. 2007. Biotechnology at the Interface of Agriculture and Medicine. XII National Congress of Biotechnology and Bioengineering, Morelia, Mexico, Jun 25-29. (talk)

71. **Medina-Bolivar, F.**, Nopo-Olazabal, C., Sivakumar, G., Nopo-Olazabal, L., Hannigan, R., Redeker, K., Lorence, A., Purnell, C., Harris, S., Simeon, S. 2007. Trichloroethylene induced stilbenoid compounds and antioxidant activity in peanut roots. Annual Meeting of the Phytochemical Society of North America. St. Louis, MO. Jul 21-25. (talk)

72. Sivakumar, G., Condori, J., Hannigan, R., Dolan, M., **Medina-Bolivar, F**. 2007. HPLC-MS screening for resveratrol and its derivatives in hairy root cultures of peanut. Annual Meeting of the Phytochemical Society of North America. St. Louis, MO. Jul 21-25. (talk)

73. Condori, J., Medrano, G., Sivakumar, G., Cramer, C., **Medina-Bolivar, F.** 2007. Cloning and characterization of resveratrol synthase from peanut using a transient expression system. Annual Meeting of the Phytochemical Society of North America. St. Louis, MO. Jul 21-25. (poster)

74. Nopo-Olazabal, C., Nopo-Olazabal, L., Sivakumar, G., Condori, J., Hannigan, R., **Medina-Bolivar, F.** 2007. Screening for stilbenes in hairy roots of *Nicotiana benthamiana*. Annual Meeting of the Phytochemical Society of North America. St. Louis, MO. Jul 21-25. (poster)

75. **Medina-Bolivar, F.**, Nopo-Olazabal, C., Sivakumar, G., Nopo-Olazabal, L., Condori, J. 2007. Screening for bioactive stilbenes in the genus *Nicotiana* and other Solanaceae species. 61st Tobacco Science Research Conference. Charlotte, NC. Sep 23-26. (invited talk)

76. **Dolan, M.**, Medina-Bolivar, F., Bennett, S. 2007. Production of bioactive stilbenes in hairy root cultures of plants. Biocontact Quebec 2007. Ontario, **CANADA**. Oct. 3-5, 2007 (talk).

77. **Medina-Bolivar, F**. 2007. Harnessing plant and chemical diversity for the production of medicinal and nutritional compounds. In: Abstracts of the Latin American and Caribbean Congress on Agricultural Biotechnology – REDBIO. Vina del Mar. **CHILE**. Oct 22-26. (invited talk)

78. **Medina**-Bolivar, F. 2007. "Induction and biological activity of resveratrol and its derivatives from hairy root bioreactors"
[Note, this talk was presented in Spanish with the title: "*"Inducción y actividad biológica del resveratrol y sus derivados en bioreactores de "hairy roots"; see*

http://www.fundacioncassara.org.ar/?es/docencia/seminarios/agenda/Pablo Cassara Foundation. Buenos Aires, **ARGENTINA**. October 31, 2007 (invited talk).

2008

79. Medina-Bolivar, F. 2008. Production of Bioactive Resveratrol Analogues in Hairy Roots of Peanut". Meeting of the Southern Association of Agricultural Scientists. Dallas, TX. Feb 4, 2008. (invited talk)

80. Medina-Bolivar, F. 2008. Stilbenoid phytoalexins: Harnessing plant defense metabolism for human health. University of Arkansas, Fayetteville, AR. February 19, 2008. (invited talk)

81. Sawalha, A., **Medina-Bolivar, F**. 2008. Characterization of stilbenoids in Japanese knotweed (*Polygonum cuspidatum*) by HPLC AND HPTLC. National Conference on Undergraduate Research. Salisbury, MD. April 10-12. (poster)

82. Sivakumar, G., Villagarcia, H., Condori, J., Hubstenberger, J., Dolan, M., **Medina-Bolivar, F.** 2008. Production of resveratrol analogues in hairy root bioreactors: A biotechnological source for phytopharmaceuticals. PharmaForum . Little Rock, AR., May 18-20. (talk)

83. Medina-Bolivar, F., Srivatsan, M., Condori, J., Sivakumar, G., Badanavalu, M., Dolan, M. 2008. Production and neuroprotective properties of natural resveratrol analogues from peanut hairy roots. World Congress on In Vitro Biology. Tucson, AZ. Jun 14-18. (invited talk)

84. Sivakumar, G., Dolan, M., Condori, J., Bennett, S., Bacchetta, L., **Medina-Bolivar, F.** Air lift balloon type bioreactor: Platform for commercial production of plant-based small molecules and tissues. World Congress on In Vitro Biology, Tucson, AZ. Jun 14-18 (talk)

85. Medina-Bolivar, F. Induced Biosynthesis and Biological Activity of Natural Resveratrol Analogues from Hairy Root Cultures. 6th Annual Congress of International Drug Discovery Science and Technology. Beijing, **CHINA.** Oct. 18-22. (invited talk)

86. Medina-Bolivar, F. 2008. Biosynthesis of Bioactive Resveratrol Analogues in Hairy Root Cultures. National Key Laboratory of Biochemical Engineering, Chinese Academy of Sciences. Beijing, **CHINA**. Oct. 22, 2008. (invited talk)

87. Condori, J., Sivakumar, G., Dolan, M., **Medina-Bolivar, F**. 2008. Expression of stilbene synthase and stilbenoid production in hairy roots of peanut. ABI Fall Research Symposium. Little Rock, AR. Oct 7. (poster)

2009

88. Abbott J, Carrier DJ, **Medina-Bolivar F**, Clausen E. 2009. Determination of biological activity of stilbenoids resveratrol, piceatannol, arachidin-1 and arachidin-3. International Food Technology Annual Meeting. Anaheim, CA. June 6-9. (poster)

89. Condori J, **Medina-Bolivar F**. 2009. Functiona.l characterization of stilbene synthase using a transient expression system and production of resveratrol and prenylated stilbenoids in hairy roots of peanut. Gordon Conference on Metabolic Engineering. Waterville Valley, NH. July 12-17 (poster)

90. Medina-Bolivar F, Dolan M, Srivatsan M, Carrier J, Sivakumar G, Ganapathy, Condori J, Villagarcia H, Nopo-Olazabal C, Nopo-Olazabal L, Abbott J, Hubstenberger J. 2009. Production and bioactivity of natural resveratrol analogues from hairy root cultures. 238th American Chemical Society National Meeting and Exposition. Washington, DC. August 16-20, 2009. (invited talk)

91. Nopo-Olazabal C, Hubstenberger J, **Medina-Bolivar F**. 2009. Elicitation of stilbenoids in hairy roots of muscadine grape. International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

92. Condori J, Dolan M, **Medina-Bolivar F**. 2009. Characterization of a resveratrol synthase gene family in hairy roots of peanut. International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

93. Nopo-Olazabal L, Wu S, Allen T, Baker J, **Medina-Bolivar F**. 2009. Characterization of inducible phenolics in hairy roots cultures of the Japanese knotweed (*Polygonum cuspidatum*). International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

94. Malatesta M, Nopo-Olazabal L, **Medina-Bolivar F**. 2009. Characterization of constitutive and inducible specialized metabolites in hairy roots of annatto (*Bixa orellana*). International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

95. Khodakovskaya M, de Silva K, Nopo-Olazabal C, Laska B, Ali N, **Medina-Bolivar F**, Grace S. 2009. Regulation of primary and secondary metabolism in plant cells by genetic manipulation of phosphoinositol pathway. International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

96. Sivakumar G, Lay J, **Medina-Bolivar F**, Xu J. 2009. Botanical insulin: A plant-powered potential antidiabetic molecule. International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

97. Abbott J, Engelberth A, Martin B, Clausen E, **Medina-Bolivar F**, Villagarcia H, Carrier DJ. 2009. Purification and determination of antioxidant activity of bioactive stilbenoids from hairy root cultures of peanut. International Plant Molecular Biology Meeting. St. Louis, MS. October 26-30. (poster)

2010

98. Condori J, Nopo-Olazabal C, **Medina-Bolivar F**. 2010. Bioinformatic tools for cloning and characterizating the stilbenoind pathway in peanut and muscadine grape. 7th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS). Jonesboro, AR. February 19-20. (poster).

99. Sivakumar G, **Medina-Bolivar F**, Lay JO. 2010. Natural corosolic acid: Future phytoinsulin? CHI 17th International Molecular Medicine Tri-Conference. San Francisco, CA. February (poster)

100. **Medina-Bolivar, F**. Resveratrol: Harvesting healthy chemicals from hairy roots. 2010. Dept. of Biochemistry. University of Arkansas for Medical Sciences. Little Rock, AR. March 10, 2010. (Invited speaker).

101. Anna Radominska-Pandya A, Nair V, Bratton SM, Gallus-Zawada A, Prather PL, **Medina-Bolivar F**. 2010. Human UDP-glucuronosyltransferases (UGTs) are involved in the metabolism of the natural resveratrol analogues arachidin-1, arachidin-3 and piceatannol. Experimental Biology Meeting. Anaheim, CA. April 2010. (poster).

102. Greenway M, **Medina-Bolivar F**, Dolan M, Nopo-Olazabal L, Phillips IC, Lloyd MN, Hubstenberger J, Phillips GC. 2010. Characterization of hairy root cultures and elicitation of coumaric acid in raspberry, *Rubus idaeus*. 2010. Society for In Vitro Biology Congress. St. Louis, MO. June 6-11 (poster).

103. **Medina-Bolivar F**, Condori J, Nopo-Olazabal C, Nopo-Olazabal L, Baker J, Atwill R, Abbot J, Dolan M, Carrier J, Sivakumar G, Nair V, Hubstenberger J. 2010. Distinct biosynthesis of resveratrol analogues in hairy root cultures of peanut and muscadine grape. 12th International Association for Plant Biotechnology Congress. St. Louis, MO. June 6-11 (invited talk).

104. Nopo-Olazabal L, Wu S, Rimando A, Joshee N, **Medina-Bolivar F**. 2010. Production of antitumor flavonoids in hairy roots of *Scutellaria lateriflora*. 1st Annual Conference of the American Council for Medicinally Active Plants. New Brunswick, NJ. July 20-23 (talk)

105. Nopo-Olazabal C, Villagarcia H, Khodakovskaya M, **Medina-Bolivar F**. 2010. Manipulation of secondary metabolism in hairy roots of tomato transformed with a mammalian polyphosphate 5-phosphatase. 1st Annual Conference of the American Council for Medicinally Active Plants. New Brunswick, NJ. July 20-23 (poster)

106. Condori J, Nopo-Olazabal C, Atwill R, Baker J Nopo-Olazabal L, **Medina-Bolivar F**. 2010. Comparison of sodium acetate- and methyl jasmonate-mediated elicitation of bioactive stilbenoids in hairy root cultures of peanut. 1st Annual Conference of the American Council for Medicinally Active Plants. New Brunswick, NJ. July 20-23 (poster; *1st Place Poster Award Competition by J. Condori*)

107. **Medina-Bolivar F**, Condori J, Carrier J, Srivatsan M, Radominska-Pandya A, Sivakumar G, Nair V, Dolan M. 2010. Natural resveratrol analogs from root cultures of peanut and muscadine grape: bioproduction, biotransformation and bioactivity. 1st Annual Conference of the American Council for Medicinally Active Plants. New Brunswick, NJ. July 20-23 (invited talk)

108. Condori J, Atwill R, Nopo-Olazabal L, **Medina-Bolivar F**. 2010. Cyclodextrin regulates stilbenoid biosynthesis leading to high levels of resveratrol and its prenylated analogs in hairy root cultures of peanut. Plant Powered-Production-P3 Symposium. Morrilton, AR. August 15-17. (poster)

109. **Medina-Bolivar F**, Condori J, Nopo-Olazabal C, Nopo-Olazabal L, Dolan M, Carrier DJ, Srivatsan M, Sivakumar G, Nair V, Hubstenberger J. 2010. Biosynthesis of monomeric and oligomeric stilbenoids in hairy root cultures of peanut and muscadine grape. International Conference on Polyphenols. Montpellier, FRANCE. August 24-27. (talk).

110. Prather P, Cortez L, Nopo-Olazabal L, Nair V, **Medina-Bolivar F**, Radominska-Pandya A. 2010. Natural resveratrol analogs arachidin-1, arachidin-3 and piceatannol bind human and mice cannabinoid receptors CB1 and CB2. 9th International Society for the Study of Xenobiotics. 2010. Istambul, TURKEY. September 4-8. (poster)

111. **Medina-Bolivar F**, Condori J, Nopo-Olazabal L, Nopo-Olazabal C, Carrier J, Srivatsan M, Sivakumar G, Dolan M. 2010. Natural prenylated resveratrol analogues from root cultures: Induced biosynthesis, purification and biological activity. 1st International Conference of Resveratrol and Health. Helsingor, DENMARK. September 13-16. (poster)

112. **Medina-Bolivar F**, Condori J, Atwill RL, Nopo C, Nopo L, Carrier DJ, Srivatsan M, Nair V, Sivakumar G, Dolan M. 2010. Bioproduction of bioactive prenylated resveratrol analogs in root cultures. ABI Fall Research Symposium. Little Rock, AR. September 29. (poster)

113. Gilbert K, Blossom SJ, Gomez-Acevedo H, Cooney C, Plumford N, **Medina-Bolivar F**, Lorence A. 2010. Environmental pollutants as triggers of autoimmune disease: Collaborative research into mechanism of action and remediation. ABI Fall Research Symposium. Little Rock, AR. September 29. (talk)

114. Joshee N, Parajuli P, Rimando AM, **Medina-Bolivar F**, Yadav AK. 2010. Scutellaria biotechnology: Achievements and future prospects. 9th International Symposium "Prospects for the 3rd Millennium Agriculture. Cluj Napoca, ROMANIA, September 30-October 2. (talk)

115. Condori J, Atwill RL, Nopo-Olazabal L, **Medina-Bolivar F**. 2010. Effect of cyclodextrin on production of resveratrol and its prenylated analogs in hairy root cultures of peanut. Arkansas NSF EPSCoR Project Annual Conference. Little Rock, AR, October 4-5. (poster)

116. Condori J, Nopo-Olazabal C, Atwill RL, **Medina-Bolivar F**. 2010. Reference gene selection for qPCR in hairy root cultures of peanut. qPCR and Data Mining Symposium, San Francisco, CA, November 1-5. (poster; *2nd Place Poster Award Competition by J. Condori*)

117. **Medina-Bolivar F**. 2010. Harvesting healthy chemicals from hairy roots. St. Jude Children's Research Hospital. Memphis, TN, November 1. (invited talk)

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118. **Medina-Bolivar F**. 2011. Hairy root cultures of *Veratrum californicum* for the production of cyclopamine and related steroidal alkaloids. Veratrum Summit. Park City, UT, June 28-30. (invited talk)

119. Balmaceda C, Atwill RL, Nopo-Olazabal L, Marsh Z, **Medina-Bolivar F**. 2011. Synergistic effect of cyclodextrin and methyl jasmonate on production of resveratrol and its prenylated analogues arachidin-1 and arachidin-3 in hairy root cultures of peanut. 2nd Annual Conference of the American Council for Medicinally Active Plants. July 17-20. (poster: *1st Place Poster Award Competition by C. Balmaceda*)

120. Nopo-Olazabal C, Nopo-Olazabal L, Condori J, Patel A, Hubstenberger J, **Medina-Bolivar F**. 2011. Differential elicitation of stilbenoids in hairy root cultures of muscadine grape and peanut. 2nd Annual Conference of the American Council for Medicinally Active Plants. July 17-20. (invited talk)

121. Zhai B, Rivas F, Clark J, Ferrand MI, Nopo L, **Medina-Bolivar F**. 2011. Characterization of methyl-jasmonate inducible metabolites in hairy root cultures of annatto (*Bixa orellana*): Towards the identification of novel antimalarial phytochemicals. Arkansas P3 Symposium. Heber Springs, AR. July 26-28. (poster)

122. Atwill RL, Nopo L, **Medina-Bolivar F.** 2011. Production of resveratrol and its prenylated analogs in 1 liter hairy root cultures of peanut and their purification by high performance counter current chromatography. Arkansas P3 Symposium. Heber Springs, AR. July 26-28. (poster)

123. Condori J, **Medina-Bolivar F.** 2011. Identification and characterization of a stilbene synthase gene family in peanut hairy roots. Arkansas P3 Symposium. Heber Springs, AR. July 26-28. (poster)

124. Joshee N, Parajuli P, Rimando A, **Medina–Bolivar F**. 2011. *Scutellaria ocmulgee* small: An endangered plant with limited distribution but unlimited potentials. 23rd Annual Meeting of the Association for the Advancement of Industrial Crops (AAIC): Challenges and Opportunities for Industrial Crops), Fargo, ND. September 11-14. (invited talk)

125. Atwill RL, Balmaceda C, Nopo L, Condori J, **Medina-Bolivar F.** 2011. Bioproduction and purification of arachidin-1 and arachidin-3 by high performance counter current chromatography from hairy root cultures of peanut. Arkansas Biosciences Institute Fall Research Symposium. Little Rock, AR. September 21. (poster)

126. Woodard, A., Hubstenberger J, **Medina-Bolivar F**, Phillips G, Marsico T. 2011. Biosynthesis of defense-priming volatiles from *Opuntia* associated with cactus boring moth (Lepidoptera: Pyralidae) herbivory. 59th Annual Meeting of the Entomological Society of North America, Reno, NV. November 13-16. (poster).

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127. Woodard, A., Hubstenberger J, **Medina-Bolivar F**, Phillips G, Marsico T. 2012. Biosynthesis of defense-priming volatiles from *Opuntia* associated with cactus boring moth (Lepidoptera: Pyralidae) herbivory. Plant Volatiles Gordon Research Conference. Ventura, CA. January 29-February 3. (poster)

128. Marsh Z, Nopo-Olazabal L, Joshee N, **Medina-Bolivar F**. 2012. Production of specialized metabolites in hairy root cultures of *Scutellaria lateriflora* treated with cyclodextrin and methyl jasmonate. Create @ State. Jonesboro, AR. April 5. (poster)

129. Atwill R, Nopo-Olazabal L, **Medina-Bolivar F**. 2012. Purification of the prenylated resveratrol analogs arachidin-1 and arachidin-3 from hairy root cultures of peanut by high performance counter current chromatography. Create @ State. Jonesboro, AR. April 5. (poster)

130. Zhai B, Rivas F, Connelly M, Clark J, Ferrand MI, Nopo L, **Medina-Bolivar F**. 2012. Antimalarial evaluation of hairy root cultures of *Bixa orellana*. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

131. Bratton SM, Dates C, Nair V, Nopo-Olazabal L, Francisdevaraj F, **Medina-Bolivar** F, Radominska-Pandya A. 2012. Natural prenylated resveratrol analogs arachidin-1 and arachidin-3: Altered glucuronidation could lead to enhanced bioavailability. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster).

132. Marsh Z, Nopo-Olazabal L, Yang T, Joshee N, **Medina-Bolivar F**. Elicitation and secretion of specialized metabolites in *Scutellaria lateriflora* hairy root cultures treated with cyclodextrin and methyl jasmonate. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

133. Nopo-Olazabal C, Nopo-Olazabal L, Hubstenberger J, **Medina-Bolivar F**. 2012. Induction of stilbenoids in hairy root cultures of peanut and muscadine grape treated with methyl jasmonate and hydrogen peroxide and determination of the antioxidant capacity of selected stilbenoids by the ABTS assay. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

134. Nopo-Olazabal C, Khodakovskaya M, **Medina-Bolivar F**. 2012. Expression of a mammalian polyphosphate 5-phosphatase in tomato hairy roots affects root growth and antioxidant levels. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

135. Yang T, Joshee N, Martin C, **Medina-Bolivar F.** 2012. Metabolic engineering of flavonoid biosynthesis in *Scutellaria lateriflora* hairy roots by ectopic expression of the AtMYB12 transcription factor. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

136. Marsico T, Bennet B, Huss M, **Medina-Bolivar F**. 2012. Recent advances in formal botanical education at Arkansas State University: An eye to the future. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

137. Zhang N, **Medina-Bolivar F**, Xu J. 2012. Plant hairy roots as a unique platform to study plant hydroxyproline-*O*-glycosylation process. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (poster)

138. **Medina-Bolivar F**, Balmaceda C, Atwill R, Yang T, Marsh Z, Nopo-Olazabal C, Nopo-Olazabal C, Joshee N. 2012. Root cultures as bioproduction systems of health-beneficial compounds. 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. May 22-25. (invited talk)

139. Parr R, Ball J, Nopo-Olazabal L, Atwill RL, Ghai P, **Medina-Bolivar F**. 2012. Inhibition of rotavirus infection in a human intestinal cell line by specialized metabolites of peanut hairy root cultures. 31st Annual Meeting of the American Society of Virology. Madison, WI. July 21-25. (poster)

140. Marsh Z, Nopo-Olazabal L, Yang T, Joshee N, **Medina-Bolivar F**. 2012. Induction of specialized metabolites in hairy roots of *Scutellaria lateriflora* treated with cyclodextrin and methyl jasmonate. International Congress on Natural Products Research. New York, NY. July 29-August 1. (poster)

141. Atwill R, Nopo-Olazabal L, **Medina-Bolivar F**. 2012. Bioproduction and purification of prenylated resveratrol analogs from hairy root cultures of peanut. International Congress on Natural Products Research. New York, NY. July 29-August 1. (poster)

142. Marsh Z, Nopo-Olazabal L, Yang T, Joshee J, **Medina-Bolivar F.** 2012. Effect of methyl jasmonate and cyclodextrin on production of specialized metabolites in hairy root cultures of *Scutellaria lateriflora* 2012 Arkansas EPSCoR Annual meeting, Springdale, AR. August 13-14. (poster)

143. Nopo-Olazabal C, Nopo-Olazabal L, Condori J, Hubstenberger J, **Medina-Bolivar F**. 2012. Bioproduction of stilbenoids in hairy root cultures of peanut: Induced gene expression and antioxidant activity. 2012 Arkansas EPSCoR Annual meeting, Springdale, AR. August 13-14. (poster)

144. **Medina-Bolivar F**, Balmaceda C, Atwill R, Yang T, Marsch Z, Nopo-Olazabal C, Nopo-Olazabal L, Joshee N. 2012. Elicitation and metabolic engineering strategies to increase the levels of health-related polyphenols in root cultures. 244th American Chemical Society National Meeting. Philadelphia, PA. August 19-23. (invited talk)

145. Greer AK, Bratton SM, Vo D, Ostojic N, Pyrek S, Francisdevaraj F, **Medina-Bolivar F**, Haun R, Radominska-Pandya A. 2012. Human UDP-Glucuronosyltransferases: Role in modulation of pancreatic cancer cell proliferation and drug toxicity. 18th North American

Regional International Society for the Study of Xenobiotics (ISSX) Meeting. Dallas, TX. October 14-18. (poster)

146. Dates C., Yao-Borengasser A, Bratton SM, Pyrek S, Bernock LJ, **Medina-Bolivar F**, Kadlubar S, Borrelli MJ, Mackenzie P, Radominska-Pandya A. 2012. Human UDP-Glucuronosyltransferases: Role in modulation of breast cancer cell proliferation and drug toxicity. 18th North American Regional International Society for the Study of Xenobiotics (ISSX) Meeting. Dallas, TX. October 14-18. (poster)

147. Yang T, Marsh Z, Nopo-Olazabal L, Joshee N, **Medina-Bolivar F**. 2012. Metabolic engineering and elicitation strategies to manipulate the levels of bioactive flavonoids in hairy roots of *Scutellaria lateriflora*. Arkansas Biosciences Institute Fall Research Symposium. Fayetteville, AR. October 23. (poster)

148. Zhang N, **Medina-Bolivar F**, Savary B, Xu J. 2012. Plant hairy roots as a unique platform to study plant hydroxyproline-O-glycosylation process. Arkansas Biosciences Institute Fall Research Symposium. Fayetteville, AR. October 23. (poster)

149. **Medina-Bolivar F.** 2012. "Hairy roots a source of unique medicinal compounds". University of Arkansas for Medical Sciences. Little Rock, Arkansas. November 9. (invited seminar)

150. **Medina-Bolivar F**. 2012. "Harvesting a healthy future from hairy roots". John Innes Centre. Norwich, United Kingdom. December 3. (invited lecture)

151. **Medina-Bolivar F**, Radominska-Pandya A, Atwill, Nopo-Olazabal C, Srivatsan M, Nopo-Olazabal L, Prather P, Doerksen R. 2012. Bioproduction and biological activity of the natural prenylated resveratrol analogs arachidin-1 and arachidin-3. 2nd International Conference of Resveratrol and Health. Leceister, United Kingdom. December 5-7. (poster).

2013

152. **Medina-Bolivar F**. 2013. Elicitation and metabolic engineering strategies to increase the levels of bioactive compounds in hairy root cultures. Sounthern Illinois University. Carbondale, IL. March 7. (invited seminar).

153. Marsh Z, Yang T, Nopo-Olazabal L, Joshee J, **Medina-Bolivar F.** 2013. Bioproduction of bioactive flavonoids in hairy roots of *Scutellaria lateriflora*. Southern Regional Honors Council Conference. Louisville, KY. April 4-6. (poster)

154. Patel A, Chang Y-K, Nopo-Olazabal C, Yang T, Ogutu L, Condori J, Nopo-Olazabal L, **Medina-Bolivar F**. 2013. Constitutive expression of resveratrol synthase and its effect on the biosynthesis of stilbenoids in hairy root cultures of peanut (*Arachis hypogea*). Annual Meeting of the American Society of Plant Biology – Southern Section. Little Rock, AR. April 6-8. (poster)

155. Tollett CA, Ogutu L, Chang Y-K, Nopo-Olazabal L, **Medina-Bolivar F**. 2013. Biotransformation of piceatannol to its prenylated analog arachidin-1 in hairy roots cultures of peanut. Annual Meeting of the American Society of Plant Biology – Southern Section. Little Rock, AR. April 6-8. (poster)

156. Yang T, Joshee N, Medina-Bolvar F. 2013. Regulation of flavone biosynthesis by expression of the AtMYB12 transcription factor in *Scutellaria lateriflora* hairy roots. Annual Meeting of the American Society of Plant Biology – Southern Section. Little Rock, AR. April 6-8. (talk)

157. Ogutu L, Nopo-Olazabal L, Srivatsan M, **Medina-Bolivar F**. 2013. Biosynthesis enhancement and neuroprotective activity of stilbenoids from hairy root cultures of peanut. 245th American Chemical Society National Meeting & Exposition. New Orleans, LA. April 7-11. (invited talk by Linda Ogutu).

158. Medina-Bolivar F. 2013. Biotechnological approaches to increase the levels of bioactive stilbenoids and flavonoids in hairy root cultures. Arkansas Center for Plant Powered Production-P3 Annual Meeting. Little Rock, AR. April 9. (invited talk)

159. Marsh Z, **Medina-Bolivar F**. 2013. Secondary metabolite enhancement in hairy root cultures of *Scutellaria lateriflora* by treatment with cyclodextrin and methyl jasmonate. Create@Astate. Jonesboro, AR. April 11. (talk by Zachary Marsh)

160. Nopo-Olazabal C, **Medina-Bolivar F**. 2013. Bioproduction in hairy root cultures of muscadine grape (Vitis rotundifolia Michx.). Create@Astate. Jonesboro, AR. April 11. (poster)

161. Ogutu L, Nopo-Olazabal L, Marsh Z, Srivatsan M, **Medina-Bolivar F**. 2013. Arachidin-1: bioproduction in hairy root cultures of peanut and evaluation of its neuroprotective properties. Create@Astate. Jonesboro, AR. April 11. (talk by Linda Ogutu)

162. Yang T, Medina-Bolivar F. 2013. Metabolic engineering approach to increase the level of anticancer flavonoids in *Scutellaria lateriflora* hairy roots. Create@Astate. Jonesboro, AR. April 11. (poster)

163. Ogutu L, Nopo-Olazabal L, **Medina-Bolivar F**. 2013. Biosynthesis enhancement of stilbenoids from hairy root cultures of peanut. In Vitro Biology Meeting. Providence, RI. June 15-19. (poster).

164. Marsh Z, Yang T, Nopo-Olazabal L, Joshee J, **Medina-Bolivar F.** 2013. Effect of methyl jasmonate and cyclodextrin on production of specialized metabolites in hairy root cultures of *Scutellaria lateriflora* 2012 Southern Regional Honors Council Conference. Louisville, KY AR. April 4-6. (poster)

165. **Medina-Bolivar F,** Radominska-Pandya, Bratton S, Smith K, Karydis A, Garcia-Godoy F, Nopo-Olazabal L, Ogutu L, Yang T, Marsh Z, Joshee N, Patel A, Tollett CA, Nopo-Olazabal C. 2013. Biotechnological approaches to discover and produce health beneficial hairy roots. 4th Annual Conference of the American Council for Medicinally Active Plants. Amherst, MA. June 2-5. (invited talk)

166. Yang T, Joshee N, **Medina-Bolivar F**. 2013. Expression of the AtMYB12 transcription factor in *Scutellaria lateriflora* hairy roots and its effect on the biosynthesis of the anticancer flavone wogonin. 4th Annual Conference of the American Council for Medicinally Active Plants. Amherst, MA. June 2-5. (poster)

167. **Medina-Bolivar F**, Nopo-Olazabal L, Atwill L, Tollett A, Campbell A, Nopo-Olazabal C, Radominska-Pandya A, Prather P, Srivatsan M. 2013. Purification of bioactive prenylated stilbenoids from hairy root cultures of peanut by high performance counter current chromatography. 246th Fall National Meeting and Exposition. Indianapolis, IN. September 8-12. (invited talk).

168. **Medina-Bolivar F**. 2013. Hairy roots as production and discovery platforms for natural products with health benefits. Department of Molecular and Cellular Biochemistry. Indiana University. Bloomington, IN. September 13. (invited seminar).

169. Dates C, Francisdevaraj F, Greer A, Bratton S, Pyrek S, Fahmi T, **Medina-Bolivar F**, Prather P, Radominska-Pandya A. 2013. Use of natural and synthetic cannabinoids to establish cannabinoid receptors as novel targets for the treatment of breast cancer. 10th International Society for the Study of Xenobiotics Meeting. Toronto, CANADA. September 29-October 3. (poster)

170. Radominska-Pandya A, FransisDevaraj F, Dates C, Greer A, Bratton S, Pyrek Sebastian, Fahmi T, **Medina-Bolivar F**, Haun R, Prather P. 2013. A previously unexplored link between cannabinoid receptors and UDP-glucuronosyltransferases in cancer. 10th International Society for the Study of Xenobiotics Meeting. Toronto, CANADA. September 29-October 3.

171. Nopo-Olazabal C, Nopo-Olazabal L, **Medina-Bolivar, F**. 2013. Differential biosynthesis of stilbenoids in hairy root cultures of muscadine grape and peanut. Arkansas Biosciences Institute Fall Research Symposium. Little Rock, AR. October 15. (poster)

172. Tollet CA, Knapp T, Nopo-Olazabal L, **Medina-Bolivar F**. 2013. Biosynthesis enhancement and purification of arachidin-1 from hairy root cultures of peanut. ACS Strengthening Bonds Undergraduate Symposium. American Chemical Society Southeast Regional Chapter. Memphis, TN. October 21. (poster)

2014

173. Tollett CA, Nopo-Olazabal L, **Medina-Bolivar F**. 2014. Production and purification of the anticancer compounds arachidin-1 from hairy root cultures of peanut. Undergraduate Research Posters at the Arkansas State Capitol. Little Rock, AR. March 7. (invited poster)

174. Tollet CA, Nopo-Olazabal L, **Medina-Bolivar F**. 2014. Production of stilbenoids in hairy roots cultures of peanut and their purification by high performance counter current chromatography. 247th American Chemical Society National Meeting. Dallas, TX, March 16-20. (invited talk; First Place Award by CA Tollett)

175. Tollet CA, Nopo-Olazabal L, **Medina-Bolivar F.** 2014. Biosynthesis and purification of arachidin-1 from hairy root cultures of peanut. Create@AState. Jonesboro, AR. April 10. (talk)

176. Creameans J, **Medina-Bolivar F**. 2014. Annatto hairy roots: A potential sustainable source of tocotrienols. Create@AState. Jonesboro, AR. April 10. (poster)

177. Yang T, **Medina-Bolivar F.** 2014. Elucidation of the biosynthesis of stilbenoids in peanut. Create@AState. Jonesboro, AR. April 10. (talk)

178. Knapp T, Burrows J, **Medina-Bolivar F.** 2014. Production of stilbenoids in hairy root cultures of muscadine grape treated with methyl jasmonate and cyclodextrin. Create@AState. Jonesboro, AR. April 10. (poster)

179. Yang T, Joshee N, Medina-Bolivar F. 2014. Metabolic engineering and biotransformation of flavonoids in hairy root cultures of *Scutellaria lateriflora*. Meeting of the Society for In Vitro Biology. Savannah, GA. May 31-June 4. (poster)

180. Yang T, Fang L, Nopo-Olazabal C, Nopo-Olazabal L, Tollett, CA, **Medina-Bolivar F**. 2014. Elucidating the biosynthesis of stilbenoids in peanut. Meeting of the Society for In Vitro Biology. Savannah, GA. May 31-June 4. (poster)

181. **Medina-Bolivar F**. 2014. Biotransformation, elicitation and metabolic engineering strategies to produce bioactive compounds from root cultures. 5th Annual Conference of the American Council for Medicinally Active Plants, Fargo, ND. June 15-18. (invited talk)

182. Yang T, Fang L, Nopo-Olazabal C, Condori J, **Medina-Bolivar F**. 2014. High level production of arachidin-1 and arachidin-3 upon the treatment with methyl jasmonate and cyclodextrin in peanut hairy root cultures. Arkansas Center for Plant Powered Production Symposium. Petit Jean, AR. July 28-30. (poster).

183. Yang T, Joshee N, **Medina-Bolivar F**. 2014. Biotechnological strategies to produce bioactive flavonoids in hairy root cultures of *Scutellaria lateriflora.* Arkansas Center for Plant Powered Production Symposium. Petit Jean, AR. July 28-30. (poster).

184. Creameans J, Fang L, McGregory D, **Medina-Bolivar F**. 2014. Annatto hairy roots: A potential sustainable source of bioactive compounds. Arkansas Center for Plant Powered Production Symposium. Petit Jean, AR. July 28-30. (poster).

185. Knapp T, Nopo-Olazabal C, **Medina-Bolivar F.** 2014. Effect of methyl jasmonate and cyclodextrin on production of stilbenoids in hairy roots of muscadine grape. Arkansas Center for Plant Powered Production Symposium. Petit Jean, AR. July 28-30. (poster).

186. **Medina-Bolivar F**. 2014. Unravelling the biosynthesis of prenylated stilbenoids in peanut. Arkansas Center for Plant Powered Production Symposium. Petit Jean, AR. July 28-30. (invited talk).

187. **Medina-Bolivar F**, Yang T, Tollet C, Nopo-Olazabal L, Fang L, Nopo-Olazabal C. 2014. Bioprodution and biological activities of arachidin-1 and arachidin-3: Potential functional ingredients derived from peanut. 248th American Chemical Society National Meeting & Exposition, San Francisco, CA. August 10-14. (invited talk).

188. Yang T, Fang L, Nopo-Olazabal C, Condori J, Tollett CA, **Medina-Bolivar F**. 2014. Co-treatment of methyl jasmonate and cyclodextrin enhances production of arachidin-1 and arachidin-3 and expression of resveratrol synthase in hairy root cultures of peanut. Arkansas Biosciences Institute Fall Research Symposium. Arkansas State University. Jonesboro, AR October 7. (poster)

189. Creameans J, Fang L, McGregory D, **Medina-Bolivar F**. 2014. Elicitation of bioactive compounds in hairy root cultures of annatto. Arkansas Biosciences Institute Fall Research Symposium. Arkansas State University. Jonesboro, AR October 7. (poster)

190. Knapp T, Nopo-Olazabal C, Nopo-Olazabal L, **Medina-Bolivar F**. 2014 Production of stilbenoids in elicitor-treated hairy root cultures of muscadine grape. Arkansas Biosciences Institute Fall Research Symposium. Arkansas State University. Jonesboro, AR October 7. (poster)

2015

191. Knapp T, **Medina-Bolivar F**. 2015. Hairy root cultures of muscadine grape: A sustainable bioproduction and discovery platform for therapeutic agents. STEM Posters at the Capitol. Little Rock, AR. Feb 11 (poster)

192. Knapp T, Luis Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Production of stilbenoids in hairy root cultures of muscadine grape: Effect of methyl jasmonate and cyclodextrin. 249th American Chemical Society National Meeting & Exposition, Denver, CO. March 22-25. (invited talk by undergraduate student T. Knapp)

193. **Medina-Bolivar F**, Yang T, Fang L, Mockaitis K, Joshee N. 2015. Hairy roots and human health: Production and discovery of bioactive compounds. Symposium on "Medicinal and Aromatic Crops: Production, Phytochemistry, & Utilization". Division of Agricultural and Food Chemistry. 249th American Chemical Society National Meeting & Exposition, Denver, CO. March 22-25. (invited talk)

194. Creameans J, Fang L, McGregory D, **Medina-Bolivar F**. 2015. Hairy root cultures of annatto: a potential sustainable source of bioactive compounds. Create@AState. Jonesboro, AR. April 12. (poster)

195. Brooks J, Yang T, Fang L, **Medina-Bolivar F**. 2015. Effect of sucrose on the production of stilbenoids in hairy root cultures of peanut. Create@AState. Jonesboro, AR. April 12. (poster)

196. Yang T, Fang L, Nopo-Olazabal C, Condori J, **Medina-Bolivar F**. 2015. High level production of arachidin-1 and arachidin-3 in hairy root cultures of peanut co-treated with methyl jasmonate and cyclodextrin. Create@AState. Jonesboro, AR. April 12. (poster)

197. Knapp T, **Medina-Bolivar F**. 2015. Stilbenoid production in hairy root cultures of muscadine grape: effects of methyl jasmonate and cyclodextrin. Create@AState. Jonesboro, AR. April 12. (oral)

198. **Medina-Bolivar F**. Innovations on the use of plant genetic resources for the production and discovery of bioactive compounds for human health (Talk in Spanish: Innovaciones en el uso de recursos biologicos de plantas para la produccion y descubrimiento de compuestos para la salud humana). First Workshop on Protection and Innovation in Peruvian Natural Products. Lima, Peru. May 19. (invited talk)

199. Savary B, Xu J, Zhang N, Teoh K, Yu S, **Medina-Bolivar F**. 2015. Preparation, analysis, and bioassay of functional oligosaccharides isolated from rice bran fiber. 2015 In Vitro Biology Meeting. Tucson, AZ. May 30-June 3 (poster).

200. Savary B, Xu J, Zhang N, Teoh K, Yu S, **Medina-Bolivar F**. 2015. Generation of feruloylated oligosaccharides from rice bran fiber for functional analysis. 6th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Spokane, WA. June 9-12 (poster).

201. **Medina-Bolivar F**, Mockaitis K, Yang T, Fang L, Nopo-Olazabal L. 2015. Transcriptomic and targeted metabolomics approaches to elucidate the biosynthesis of arachidins: Cannabinoid receptor modulators from peanut. 6th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Spokane, WA. June 9-12 (talk).

202. Knapp T, Nopo-Olazabal C, Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Enhanced and sustainable production of stilbenoids in hairy root cultures of muscadine grape co-treated with methyl jasmonate and cyclodextrin. 6th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Spokane, WA. June 9-12 (poster).

203. Creameans J, Fang L, McGregory D, Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Annatto hairy roots: A sustainable source of bioactive compounds with applications in human health. 6th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Spokane, WA. June 9-12 (poster).

204. Creameans J, Yang T, Joshee N, **Medina-Bolivar F**. 2015. Characterization of inducible and secreted metabolites from hairy root cultures of *Scutellaria lateriflora*. 6th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Spokane, WA. June 9-12 (poster).

205. Yang T, Fang L, Nopo-Olazabal C, Condori J, **Medina-Bolivar F**. 2015. Production and biosynthesis of prenylated stilbenoids in hairy root cultures of peanut. Arkansas P3 Annual Research Symposium. Fayetteville, AR. June 29-July 1 (invited talk by T. Yang).

206. Tollett CA, Day C, Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Biosynthesis enhancement and purification of prenylated stilbenoids from hairy root cultures of peanut. Arkansas P3 Annual Research Symposium. Fayetteville, AR. June 29-July 1 (poster)

207. Brooks J, Collier S, Najwa L, Fang L, Yang T, **Medina-Bolivar F**. 2015. High levels of sucrose enhance production of stilbenoids in peanut hairy root cultures. Arkansas P3 Annual Research Symposium. Fayetteville, AR. June 29-July 1 (poster)

208. Creameans J, Fang L, McGregory D**,** Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Hairy root cultures of annatto: a sustainable source of tocotrienols. Arkansas P3 Annual Research Symposium. Fayetteville, AR. June 29-July 1 (poster)

209. Savary B, Xu J, Zhang N,Teoh K, Yu S, **Medina-Bolivar F**, Lee S-O. 2015. Preparations, separations chemistry, and colonocyte bioassay of feruloylated arabinoxylan oligosaccharides isolated from rice bran. AFRI Project Director's Meeting. Chicago, IL. July 10. (poster)

210. Miller J, Creameans J, **Medina-Bolivar F**. 2015. Optimizing elicitation conditions of *Bixa orellana* hairy root cultures to produce phytochemicals for potential treatment of malaria. Bridging the Divide Research Symposium. Arkansas State University. August 4. (talk by J. Miller – undergraduate student Philander Smith College)

211. Miller J, Creameans J, **Medina-Bolivar F**. 2015. Optimizing elicitation conditions of *Bixa orellana* hairy root cultures to produce phytochemicals for potential treatment of malaria. Bridging the Divide Research Symposium. Arkansas State University. August 4. (poster)

212. Creameans J, Fang L, McGregory D**,** Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Application of annatto hairy roots for the production of bioactive compounds for human health. 54th Annual Meeting of the Phytochemical Society of North America. Urbana, IL. August 8-12. (poster)

213. Tollett CA, Day C, Yang T, Nopo-Olazabal L, **Medina-Bolivar F**. 2015. Biosynthesis enhancement and purification of bioactive prenylated stilbenoids from hairy root cultures of peanut by high performance countercurrent chromatography. 54th Annual Meeting of the Phytochemical Society of North America. Urbana, IL. August 8-12. (poster)

214. Day C, Tollett C, **Medina-Bolivar F**. 2015. Peanut hairy root cultures as bioproduction platforms for prenylated stilbenoids: Bioactive compounds relevant to human health. Arkansas Biosciences Institute Summer Internship Symposium. Arkansas State University, Jonesboro, AR. September 11. (talk)

215. Brooks J, Fang L, Collier S, Yang T, **Medina-Bolivar F**. 2015. High levels of sucrose increase production of bioactive prenylated stilbenoids in hairy root cultures of peanut. Arkansas Biosciences Institute Fall Research Symposium. Fayetteville, AR. October 6. (poster)

216. **Medina-Bolivar F**. 2015. Plants y salud humana. Nuevos avances y applicaciones biotecnologicas (Plants and human health: New advances and biotechnological applications). Universidad Peruana Cayetano Heredia. Lima, Peru (Invited talk)

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217. **Medina-Bolivar F**, Yang T, Fang L, Mockaitis, K. 2016. Elucidating the biosynthesis of prenylated stilbenoids in peanut through an integrated targeted metabolomics and transcriptomics approach. USDA-NIFA Program Directors Meeting. San Diego, CA. January 8. (poster)

218. **Medina-Bolivar F**, Yang T, Fang L, Mockaitis, K. 2016. Elucidating the biosynthesis of prenylated stilbenoids in peanut through an integrated targeted metabolomics and transcriptomics approach. Plant and Animal Genome Conference. San Diego, CA. January 9-13. (poster)

219. Creameans J, Vellanki K, Dolan M, **Medina-Bolivar F**. 2016. Bioproduction and anti-inflammatory activity of delta-tocotrienol enriched extracts from hairy roots of annatto. 251st American Chemical Society National Meeting & Exposition. San Diego, CA. March 13-17. (invited talk by J. Creameans; Second Place Award)

220. Gershlak J, Hernandez S, Perreault L, Larson S, Fontana G., Yang T, Dominko T, Rolle M, Weathers P, Ashton R, **Medina-Bolivar F**, Cramer C, Murphy W, Gaudette G. 2016. Crossing kingdoms: Exploiting decellularized plants as pre-vascularized scaffolds for tissue engineering. 20th Annual Regenerative Medicine Workshop. Hilton Head, NC. March 16-19. (talk and poster)

221. Witcher C, Lockwood H, Mattila M, Havner R, Taylor J, **Medina-Bolivar F**, Ball JM, Parr R. 2016. Quantification of rotavirus particles in HT29.f8 cells treated with t-A3. ASM Microbe 2016. Boston, MA. June 16-20. (poster)

222. Lockwood H, Witcher C, Havner R, Taylor J, Clack B, **Medina-Bolivar F**, Ball JM, Parr R. 2016. Regulation of the transcriptome of rotavirus-infected HT29.f8 cells by arachidin-3. ASM Microbe 2016. Boston, MA. June 16-20. (poster)

223. Yang T, Fang L, Mockaitis K, **Medina-Bolivar F**. 2016. Bioproduction and biosynthesis of prenylated stilbenoids in peanut: Bioactive compounds for plant and human health. 7th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Lima, Peru. June 29-July 1. (poster).

224. **Medina-Bolivar F**, Yang T, Fang L, Tollett CA, Day C, Matei C, Nopo-Olazabal L, Mockaitis K. 2016. Peanut hairy roots: Sustainable systems for production and discovery of bioactive compounds for human health. 7th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Lima, Peru. June 29-July 1. (invited talk).

225. Creameans J, Vellanki K, Matei C, Nopo-Olazabal L, **Medina-Bolivar F**. 2016. Bioproduction and anti-inflammatory activity of delta-tocotrienol-enriched extracts from hairy roots of *Bixa orellana*. 7th Annual Conference of the American Council for Medicinally Active Plants (ACMAP). Lima, Peru. June 29-July 1. (invited talk; Second Place Award).

226. Lockwood H, Witcher C, Slay R, Taylor J, Clack B, Ball J, **Medina-Bolivar F**, Parr R. Discovering the mechanism of action of stilbenoids on Rotavirus Infected Cells. 7th Annual Conference of the American Council for Medicinally Active Plants. Lima, Peru, June 29-July 1, 2016. (invited talk by R. Parr).

227. Witcher CM, Lockwood HN, Strange E, Matilla M, Taylor JI, Clack B, **Medina-Bolivar F**, Parr RD. 2016. A time course analysis of the effects of stilbenoids on the ultrastructure and viral populations of rotavirus-infected cells. 7th Annual Conference of the American Council for Medicinally Active Plants. Lima, Peru, June 29-July 1, 2016. (poster).

228. Savary BJ, Teoh K, Zhang N, Xu J, **Medina-Bolivar F**, Yu S, Lee S-O, Wang Y-J. 2016. Preparation and analysis of functional oligosaccharides from rice bran arabinoxylan. 252nd American Chemical Society National Meeting & Exposition, Philadelphia, PA. August 21-25. (invited talk by B. Savary)

229. Nopo-Olazabal L, Yang T, Matei C, Philippe A, Fang L, Day C, Karouni A, **Medina-Bolivar F**. 2016. Innovative plant products for the prevention and treatment of obesity. Arkansas Biosciences Institute, Fall Research Symposium. Little Rock, AR, September 13. (poster).

230. **Medina-Bolivar, F**. 2016. Arkansas Biosciences Institute: Paving the Way for Education and Research Innovation. 2nd Meeting of the Northeast Arkansas Hispanic Professional Network. Jonesboro, AR, December 6. (invited talk).

231. Gershlak J, Hernandez S, Fontana G, Perreault L, Hansen K, Larson S, Binder B, Dolivo D, Yang T, Dominko T, Rolle M, Weathers P, **Medina-Bolivar F**, Cramer C, Murphy W, Gaudette G. 2016. Crossing kingdoms: Using decellularized plants as pre-vascularized tissue engineering scaffolds. Annual Conference and Exhibition of the Tissue Engineering & Regenerative Medicine International Society (TERMIS-Americas). San Diego, CA. December 11-14. (poster)

2017

232. **Medina-Bolivar F**. 2017. Peanut and piano: How great things can result from a little stress. TEDxArkansas State University. Jonesboro, AR., January 29. (invited talk).

233. Matei C, Philippe A, Day C, Yang T, Fang L, Nopo-Olazabal L, **Medina-Bolivar F**. 2017. Peanut: A source of bioactive compounds for the prevention and treatment of obesity. Arkansas STEM Posters at the Capitol. Little Rock, AR. February 15. (poster).

234. Philippe A, Matei C, Day C, Nopo-Olazabal L, Yang T, Fang L, Day C, Nopo-Olazabal L, **Medina-Bolivar F**. 2017. Bioproduction and anti-obesity properties of peanut stilbenoids. 31st Annual Meeting of the National Council for Undergraduate Research. Memphis, TN. April 6-8. (oral).

235. Day C, Tollett A, Yang T, Fang L, **Medina-Bolivar F**. Bioproduction of peanut stilbenoids: Bioactive compounds for human health. 31st Annual Meeting of the National Council for Undergraduate Research. Memphis, TN. April 6-8. (poster).

236. Matei C, Nopo-Olazabal L, Philippe A, Day C, Yang T, Fang L, **Medina-Bolivar F**. 2017. Prenylated stilbenoids: Potential anti-obesity compounds from peanut. 31st Annual Meeting of the National Council for Undergraduate Research. Memphis, TN. April 6-8. (poster).

237. **Medina-Bolivar F**, Yang T, Fang L, Philippe A, Day C, Nopo-Olazabal L. 2017. Prenylated stilbenoids: Potential chemopreventive and therapeutic agents for breast cancer. Spring 2017 Cancer Research Conference. Memphis, TN. May 2. (poster).

238. Medina-Bolivar F. 2017. Arkansas Biosciences Institute: Paving the way for research innovation. Jonesboro, AR. May 17. (invited talk to University of Arkansas visiting faculty).

239. **Medina-Bolivar F**, Yang T, Fang L, Mockaitis K. 2017. Biosynthesis and enhanced production of functional ingredients in hairy root cultures of peanut. 8th Annual Conference of the American Council for Medicinally Active Plants. Clemson, SC. June 20-23. (invited talk).

240. Jeffers J, Roberto P, Karouni A, **Medina-Bolivar F**. 2017. Production of antioxidant stilbenoids in hairy root cultures of peanut. Bridge Program Undergraduate Research Symposium at Arkansas State University. Jonesboro, AR. August 3. (poster).

241. Yang T, Fang L, Philippe A, Day C, Nopo-Olazabal L, **Medina-Bolivar F**. 2017. Prenylated stilbenoids: Potential chemopreventive and therapeutic agents for breast cancer. Arkansas Biosciences Institute. Fall Research Symposium. Fayetteville, AR. October 25. (poster).

242. Azim M, Yang T, Knapp P**, Medina-Bolivar F**. 2017. Metabolic engineering of muscadine with a peanut gene to produce arachidin-2: A bioactive prenylated stilbenoid with several

applications in human health. Fall Research Symposium. Fayetteville, AR. October 25. (poster).

2018

243. Sanders S, Podicheti R, Yang T, Fang L, Jayanthi S, Rajan G, Thallapuranam S, **Medina-Bolivar F**, Mockaitis K. 2018. Stilbenoid prenylation pathway discovery in peanut using targeted transcriptomics. Plant & Animal Genome Conference. San Diego, CA. January 13-17. (poster).

244. Vellanki K, Swafford K, Karouni A, Roberto P, Yang T, **Medina Bolivar F**. 2018. Peanut hairy roots: A sustainable production platform of bioactive compounds for agriculture and human health. STEM Posters at the Arkansas Capitol. Little Rock, AR. March 5. (poster).

245. Knapp P, Azim M, Yang T, **Medina-Bolivar F**. 2018. Improving the health benefits of muscadine grape through genetic engineering. STEM Poster at the Arkansas Capitol. Little Rock, AR. March 5. (poster).

246. Azim M, Knapp P, Yang T, **Medina-Bolivar F**. 2018. Production of the bioactive prenylated stilbenoid arachidin-2 in muscadine grape hairy roots expressing a prenyltransferase gene from peanut. 102nd Annual Meeting of the Arkansas Academy of Sciences. Jonesboro, AR. April 6-7. (talk by M. Azim)

247. Karouni A, Yang T, **Medina-Bolivar F**. 2018. HPLC profiling of prenylated stilbenoids in diverse cultivars of peanut. Create@AState. Jonesboro, AR. April 17. (poster). (First Place Poster Award)

248. Vellanki K, Swafford K, Karouni A, Roberto P, Yang T, **Medina-Bolivar F**. 2018. Optimizing the extraction process of bioactive compounds in hairy root cultures of peanut Create@AState. Jonesboro, AR. April 17. (poster).

249. Azim M, Knapp P, Yang T, **Medina-Bolivar F**. 2018. Genetic transformation of muscadine grape to produce arachidin-2: A bioactive stilbenoid with multiple benefits for human health. Create@AState. Jonesboro, AR. April 17. (poster).

250. Knapp P, Azim M, Yang T, **Medina-Bolivar F**. 2018. Metabolic engineering to enhance the health benefits of muscadine grape. Create@AState. Jonesboro, AR. April 17. (poster).

251. Roberto P, **Medina-Bolivar F**. 2018. Sustainable bioproduction of antioxidant stilbenoids in peanut hairy roots. Create@AState. Jonesboro, AR. April 17. (poster).

252. Rebekah Napier-Jameson1, Caleb M Witcher1,2, Stormey B Wisdom1, Essence B Strange1, Doran S Triggs1, Luanna L Saade1, Josephine Taylor1, Judith M Ball3, Fabricio Medina-Bolivar4, Rebecca D Parr1. A comparison of a natural and synthetic stilbenoid, arachidin-3, on a rotavirus infected human intestinal cell line. American Society for Biochemistry and Molecular Biology (ASBMB) Annual Meeting. San Diego, CA. April 21-25. (poster).

253. Karouni A, Yang T, **Medina-Bolivar F**. 2018. Elicitation of prenylated stilbenoids in hairy root cultures of three cultivars of peanut. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

254. Roberto P, Gonzalez Romero ME, **Medina-Bolivar F**. 2018. Sustainable bioproduction of antioxidant stilbenoids in peanut hairy roots. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

255. Azim M, Knapp P, Yang T, **Medina-Bolivar F**. 2018. Ectopic expression of a peanut prenyltransferase gene in muscadine grape hairy roots to produce the bioactive prenylated stilbenoid arachidin-2. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

256. Mohammadhosseinpour S, Fang L, Yang T, **Medina-Bolivar F**. 2018. Bioproduction and purification of bioactive prenylated stilbenoids from hairy root cultures of peanut. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

257. Gonzalez Romero ME, **Medina-Bolivar F**. 2018. *In vitro* seed germination and establishment of hairy root cultures of a Peruvian peanut cultivar as a bioproduction platform of stilbenoids. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

258. Yang T, Fang L, Sanders S, Jayanthi S, Rajan G, Podicheti R, Thallapuranam SK, Mockaitis K, **Medina-Bolivar F**. 2018. Peanut hairy roots: A bioproduction platform for elucidating the biosynthesis of prenylated stilbenoids. In Vitro Biology Meeting. St. Louis, MO. June 2-6. (poster).

259. **Medina-Bolivar F**. 2018. Unearthing the health benefits of the peanut: A tale of hairy roots. 4th North Dakota State University Conference on Food for Health. Fargo, ND. July 8-11. (invited Plenary Talk)

260. Wisdom S, Lockwood H, Napier-Jameson R, Clack B, Turner J, **Medina-Bolivar F**, Ball J, Parr R. 2018. Rotavirus infections treated with arachidin 3 modulate host lipid metabolism. American Society of Virology. College Park, MD. July 14-18. (poster).

261. **Medina-Bolivar F**. 2018. Unearthing the peanut: From hairy roots to human health. Arkansas Biosciences Institute Fall Research Symposium. Little Rock, AR. September 25. 2018.

262 **Medina-Bolivar F**. 2018. Sustainable bioproduction and biosynthesis of prenylated stilbenoids. 5th International Conference of Resveratrol and Health. Xi'an, China. October 18-20. (invited talk)

263. Victoriano R, Roberto P, **Medina-Bolivar F**. 2018. Antioxidant assessment of stilbenoid-rich extracts from peanut hairy roots. Arkansas INBRE 2018. Fayetteville, AR. November 2-3. (talk)

2019

264. **Medina-Bolivar F.** 2019. Harvesting a healthy future from peanut hairy roots…and a little stress. 9th Annual Conference of the American Council for Medicinally Active Plants (ACMAP) and International Conference of Medicinal, Aromatic and Nutraceutical Plants from Mountainous Areas. Dehradun, India. February 28. (invited talk).

265. **Medina-Bolivar F.** 2019. *Peanut hairy roots:* A biotechnological approach for production and discovery of bioactive compounds for human health. Nepal Academy of Science and Technology (NAST). Kathmandu, Nepal. February 28. (invited talk).

266. Karouni A, **Medina-Bolivar F**. 2019. Production of prenylated stilbenoids in cell suspension cultures of peanut. Create@AState, Jonesboro, AR. April (oral).

267. Swafford K, **Medina-Bolivar F**. 2019. Optimization of elicitor treatment in hairy root cultures of peanut for the production of bioactive compounds. Create@AState, Jonesboro, AR. April (poster).

268. Roedel K, **Medina-Bolivar F**. 2019. Elicitation and purification of prenylated stilbenoids from hairy root cultures of peanut. Create@AState, Jonesboro, AR. April (poster).

269. Roberto P, Vellanki K, **Medina-Bolivar F**. 2019. Enhanced bioproduction of selected antioxidant stilbenoids in peanut hairy roots. Create@AState, Jonesboro, AR. April (oral).

270. Hasan R, **Medina-Bolivar F**. 2019. A gene editing approach to elucidate the biosynthesis of stilbenoids in peanut. Create@AState, Jonesboro, AR. April (poster).

271. Mohammadhosseinpour M, Fang L, **Medina-Bolivar F**. 2019. Prenylated stilbenoids as potential chemopreventive natural products for triple negative breast cancer Create@AState, Jonesboro, AR. April (oral).

272. Karouni A, **Medina-Bolivar F**. 2019. Elicitation of prenylated stilbenoids in cell suspension cultures of peanut. In Vitro Biology Meeting. Tampa, FL. June 8-12. (oral and poster).

273. Roberto P, **Medina-Bolivar F**. 2019. Assessment of antioxidant activity of extracts and purified prenylated stilbenoids from peanut hairy root cultures. In Vitro Biology Meeting. Tampa, FL. June 8-12. (poster).

274. Hasan R, Gonzalez Romero ME, **Medina-Bolivar F**. 2019. Unraveling the biosynthesis of prenylated stilbenoids in peanut and their anti-inflammatory activities *in vitro.* In Vitro Biology Meeting. Tampa, FL. June 8-12. (poster).

275. Mohammadhosseinpour S, Fang L, **Medina-Bolivar F**. Bioproduction and purification of prenylated stilbenoids from hairy root cultures of peanut and assessment of their cytotoxicity and induction of apoptosis in triple negative breast cancer cells (MDA-MB-231). In Vitro Biology Meeting. Tampa. June 8-12. (poster).

276. Hendrix E, Roberto P, **Medina-Bolivar F**. 2019. Elucidating the antioxidant activity of stilbenoid-rich extracts from hairy root cultures of peanut. Eighth Annual Central Arkansas Undergraduate Summer Research Symposium. Little Rock, AR. July 24. (oral).

277. Roedel K, Ahmed I. Hasan R, Yang T, **Medina-Bolivar F**. 2019. Bioproduction of prenylated stilbenoids in hairy root cultures of peanut. Undergraduate Summer Research Symposium. Little Rock, AR. July 24. (poster).

278. Roberto P, Hendrix E, Ahmed I, **Medina-Bolivar F**. 2019. Assessment of the antioxidant capacity of stilbenoid-rich extracts from hairy root cultures of peanut. ABI Fall Research Symposium. Jonesboro, AR. Sep. 25. (poster).

279. Hasan R, Gonzalez Romero ME, **Medina-Bolivar F**. 2019. Anti-inflammatory mechanism of the prenylated stilbenoid arachidin-3: A natural product derived from peanut hairy roots. ABI Fall Research Symposium. Jonesboro, AR. Sep. 25. (poster).

280. Mohammadhosseinpour S, Fang L, **Medina-Bolivar F.** 2019. Prenylated stilbenoids from peanut hairy roots induce apoptosis in triple negative breast cancer cells. ABI Fall Research Symposium. Jonesboro, AR. Sep. 25. (poster – 1st Place Poster Award).

2020

281. Ho L-C, Mohammadhosseinpour S, **Medina-Bolivar F**. 2020. Peanut hairy roots: A potential source of natural products for the treatment of triple negative breast cancer. Posters at the Capitol. Little Rock, AR. February 19. (poster).

282. Gajurel G, **Medina-Bolivar F**. 2020. Biotechnological approaches to study the role of prenylated stilbenoids in abiotic stress tolerance in peanut. 5th Annual Louisiana State University-Shreveport Regional Scholars Forum. Shreveport, LA. March 12. (poster).

283. Ahmed I, Roedel K, **Medina-Bolivar F**. 2020. Optimization of culture medium conditions to increase root biomass and prenylated stilbenoid yield in hairy root cultures of peanut. 5th Annual Louisiana State University-Shreveport Regional Scholars Forum. Shreveport, LA. March 12. (poster).

283. Long C, Mohammadhosseinpour S, **Medina-Bolivar F**. 2020. Bioproduction of prenylated stilbenoids in hairy root cultures of peanut and their purification via semi-preparative HPLC. Create@AState, Jonesboro, AR. April 20 (virtual conference; abstract accepted; poster not presented).

284. Hendrix E, Roberto P**, Medina-Bolivar F.** 2020. Antioxidant-activty of stilbenoid-rich extracts from peanut hairy root cultures. Create@AState. Jonesboro, AR. April 20 (virtual conference; oral; 1st Place Undergraduate Oral Presentation Award).

285. Gajurel G**, Medina-Bolivar F**. 2020. Biotechnological tools to study the role of prenylated stilbenoids against abiotic stress in peanut. Create@AState, Jonesboro, AR. April 20 (virtual conference; poster).

286. Ahmed I, Roedel K, **Medina-Bolivar F**. 2020. Optimizing culture conditions to increase root biomass and yield of prenylated stilbenoids in hairy root cultures of peanut. Create@AState, Jonesboro, AR. April 20 (virtual conference; poster).

287. Ho L-C, Mohammadhosseinpour S, **Medina-Bolivar F.** 2020. Evaluating prenylated stilbenoids from peanut as potential therapeutic agents for triple negative breast cancer. Create@AState, Jonesboro, AR. April 20 (virtual conference; poster).

288. Roberto P, **Medina-Bolivar F.** 2020.Bioproduction of stilbenoids in hairy roots of peanut and characterization of their antioxidant activity in HeLa cells. Create@AState, Jonesboro, AR. April 20 (virtual conference; oral).

289. Hasan R, **Medina-Bolivar F.** 2020. Arachidin-3, a natural product derived from peanut hairy roots, inhibits LPS-induced inflammation by suppressing the NF-κB signaling pathway. Create@AState, Jonesboro, AR. April 20 (virtual conference; oral; 1st Place Graduate Poster Award).

290. Mohammadhosseinpour S, Ho LC, Long C, **Medina-Bolivar F.** 2020. Arachidin-1 and arachidin-3 as potential therapeutic agents for triple negative breast cancer. Create@AState, Jonesboro, AR. April 20. (virtual conference; oral).

291. Ho L-C, Mohammadhosseinpour S, **Medina-Bolivar F**. 2020. Peanut hairy roots: A potential source of natural products for the treatment of triple negative breast cancer. National Conference for Undergraduate Research. (abstract accepted; conference canceled due to COVID-19).

292. Gajurel G, **Medina-Bolivar F**. 2020. RNAi-based approach to assess the role of prenylated stilbenoids against abiotic stress in peanut. World Congress on In Vitro Biology. June 6. (virtual conference; poster).

293. Hasan R, **Medina-Bolivar F.** 2020. Anti-inflammatory mechanism of the prenylated stilbenoid arachidin-3: A natural product derived from peanut hairy roots. World Congress on In Vitro Biology. June 6. (virtual conference; poster).

294. Mohammadhosseinpour S, Ho L-C, **Medina-Bolivar F**. 2020. Prenylated stilbenoids as potential therapeutic agents for triple negative breast cancer. World Congress on In Vitro Biology. June 6. (virtual conference; poster; 2nd Place Oral Presentation Award).

295. Ahmed I, Roedel K, **Medina-Bolivar F**. 2020. Effect of root biomass on prenylated stilbenoid yield in hairy root cultures of peanut. Arkansas INBRE Virtual Research Conference. November 6-7. (poster/talk; Honorable Mention Award-Biology).

296. Ho L-C, Mohammadhosseinpour S, **Medina-Bolivar F**. 2020. Prenylated stilbenoids from peanut as potential therapeutic agents for triple negative breast cancer. Arkansas INBRE Virtual Research Conference. November 6-7. (poster/talk; 1st Place Award-Biology).

2021

297. Hasan R, Gonzalez Romero ME, **Medina-Bolivar F**. 2021. Anti-inflammatory mechanism of arachidin-3, a natural product from peanut. Arkansas Stem Posters @ The Capitol. March 9. (virtual conference; poster).

298. Ho L-C, Mohammadhosseinpour S, Long C. **Medina-Bolivar F**. 2021. Anticancer effect of prenylated stilbenoids from peanut in combination with paclitaxel in triple negative breast cancer cells. Create@AState, Jonesboro, AR. April 19. (virtual conference; oral; Dean's Award for Undergraduate Oral Presentation, College of Sciences and Mathematics).

299. Ahmed I, Roedel K, **Medina-Bolivar F**. 2021. Effect of culture conditions on stilbenoid yield in hairy root cultures of peanut. Create@AState, Jonesboro, AR. April 19. (virtual conference; oral).

300. Gajurel G, **Medina-Bolivar F**. 2021. Assessing the role of prenylated stilbenoids on abiotic stress in peanut. Create@AState, Jonesboro, AR. April 19. (virtual conference; poster).

301. Hasan R, Chakraborty S, Rajagopalan V, **Medina-Bolivar F**. 2021. Cardioprotective function of hairy root extracts and arachidins from peanut. Create@AState, Jonesboro, AR. April 19. (virtual conference; oral).

302. Mohammadhosseinpour S, Ho L-C, **Medina-Bolivar F**. 2021. Prenylated stilbenoids: Potential adjuvants for the treatment of triple negative breast cancer. Create@AState, Jonesboro, AR. April 19. (virtual conference; poster; Dean's Award for Graduate Poster Presentation, College of Sciences and Mathematics).

303. Hasan R, Chakraborty S, Rajagopalan V, **Medina-Bolivar F**. 2021. Cardioprotective functions of prenylated stilbenoids and peanut hairy root extracts. In Vitro Biology Meeting. June 5-9. (virtual conference; oral).

304. Mohammadhosseinpour S, Ho L-C, **Medina-Bolivar F**. 2021. Combined effect of prenylated stilbenoids from peanut and paclitaxel on triple negative breast cancer cell lines. In Vitro Biology Meeting. June 5-9. (virtual conference; poster).

305. Hasan R, Chakraborty S, Gonzalez Romero ME, Rajagopalan V, **Medina-Bolivar F**. 2021. Anti-inflammatory and cardioprotective function of prenylated stilbenoids from peanut hairy roots. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; oral; 1st Place Award-Graduate Oral).

306. Gajurel G, **Medina-Bolivar F**. 2021. Comparative assessment of antioxidant activity of stilbenoid-rich extracts from hairy root cultures of three cultivars of peanut. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; poster).

307. Mohammadhosseinpour S, Ho L-C, **Medina-Bolivar F**. 2021. Prenylated stilbenoids from peanut augment anticancer effects of paclitaxel in triple negative breast cancer cell lines. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; poster; 1st Place Award Graduate Poster).

308. Fang L, Yang T, **Medina-Bolivar F**. 2021. Elicitation of prenylated stilbenoids in hairy root cultures of peanut (*Arachis hypogaea*) and its wild relatives *A. ipaensis* and *A. duranensis*. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; poster).

309. Ahmed I, Roedel K, Gajurel G, **Medina-Bolivar F**. 2021. Effect of root biomass on stilbenoid yield in hairy root cultures of peanut cultivars Hull and Georgia Green. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; poster; 2nd Place Award Undergraduate Poster).

310. Sharma A, **Medina-Bolivar F**. 2021. Purification of arachidin-1 and arachidin-3 from elicited peanut hairy root cultures. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25.

311. **Medina-Bolivar F**. Natural prenylated resveratrol analogs: bioproduction and biological activities. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. June 24-25. (virtual conference; invited keynote talk).

312. **Medina-Bolivar F**. Researchers roundtable: Maintaining the momentum. Arkansas State University. July 13. (virtual roundtable; invited panelist).

313. Gajurel G, **Medina-Bolivar F**. Assessing the role of prenylated stilbenoids against water stress in peanut using a biotechnology approach. Sigma Xi Annual Meeting and Student Research Conference. November 4-7. (virtual conference; oral).

314. Ahmed I, Roedel K, Gajurel G. Effect of root inoculum on root biomass and stilbenoid yield in hairy root cultures of peanut. Sigma Xi Annual Meeting and Student Research Conference. November 4-7. (virtual conference; oral).

315. Hasan R, Chakraborty S, Sharma A, Gonzalez ME, Viswanathan V, **Medina-Bolivar F**. Anti-inflammatory and cardioprotective mechanism of prenylated stilbenoids from peanut hairy roots. Sigma Xi Annual Meeting and Student Research Conference. November 4-7. (virtual conference; oral).

316. Mohammadhosseinpour S, Ho L-C, Weaver A, **Medina-Bolivar F.** Prenylated stilbenoids: Potential adjuvants for the treatment of triple negative breast cancer. Sigma Xi Annual

Meeting and Student Research Conference. November 4-7. (virtual conference; poster; Cell Biology and Biochemistry Graduate Award).

317. **Medina-Bolivar F**. Mentoring in a research lab. Arkansas Biosciences Institute, Arkansas State University. November 17. (invited speaker).

2022

318. Ahmed I, Roedel K, Gajurel G, **Medina-Bolivar F**. 2022. Biotransformation of stilbenoids in transgenic hairy roots of tobacco to produce medicinal compounds from peanut. Arkansas State Posters at the Capitol. Little Rock, AR. March 9. (poster).

319. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F.** Elucidating the anticancer mechanism of arachidin-1 in triple-negative breast cancer cells. American Society for Biochemistry and Molecular Biology Meeting/Experimental Biology. Philadelphia, PA. April 2-5. (poster).

320. Mohammadhosseinpour S, Ho L-C, Weaver A, **Medina-Bolivar F.** Prenylated stilbenoids as potential adjuvants for paclitaxel in the treatment of triple-negative breast cancer. American Society for Biochemistry and Molecular Biology Meeting/Experimental Biology. Philadelphia, PA. April 2-5. (poster).

321. Ahmed I, Roedel K, Gajurel G, **Medina-Bolivar F**. Increasing root biomass and stilbenoid yield in hairy root cultures of peanut while maintaining the same number of root inoculum. National Conference for Undergraduate Research. April 4-8. (poster; virtual conference).

322. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F**. 2022. Arachidin-1, a potential natural product for the treatment of triple-negative breast cancer. National Conference for Undergraduate Research. April 4-8. (poster; virtual conference).

323. Mohammadhosseinpour S, Ho L-C, Weaver A, **Medina-Bolivar F.** 2022. Prenylated stilbenoids increase the apoptotic effect of paclitaxel in triple-negative breast cancer cells. Create@AState, Jonesboro, AR. April 18-20. (talk).

324. Weaver A, Mohammadhosseinpur S, **Medina-Bolivar F.** 2022. Arachidin-1 induces apoptosis and growth inhibition in triple-negative breast cancer cells. Create@AState, Jonesboro, AR. April 18-20. (poster; Chancellor's award).

325. Gajurel G, **Medina-Bolivar F.** 2022. Assessing the antioxidant activity of stilbenoid-rich extracts from hairy root cultures of three cultivars of peanut. Create@AState, Jonesboro, AR. April 18-20. (talk).

326. Long C. Gajurel G, **Medina-Bolivar F.** 2022. Effect of salt stress on growth and production of specialized metabolites in hairy root cultures of peanut. Create@AState, Jonesboro, AR. April 18-20. (poster)

327. Ahmed I, **Medina-Bolivar F.** 2022. Biotransformation of stilbenoids in transgenic hairy roots of tobacco to produce medicinally active compounds. Create@AState, Jonesboro, AR. April 18-20. (poster).

328. Mohammadhosseinpour S, Ho L-C, Weaver A, **Medina-Bolivar F.** 2022. Assessing the apoptotic effect of prenylated stilbenoids combined with paclitaxel in triple-negative breast cancer cells. In Vitro Biology Meeting, San Diego, CA. June 4-7. (talk; Gordon Sato and Wally McKeehan Award).

329. Hasan R, Chakraborty S, Rajagopalan V, **Medina-Bolivar F**. 2022. Antioxidant and cardioprotective properties of peanut hairy root-derived prenylated stilbenoids in cardiac cells. In Vitro Biology Meeting, San Diego, CA. June 4-7. (poster).

330. Gajurel G, Hasan R, **Medina-Bolivar F**. 2022. Comparative assessment of antioxidant activity of prenylated stilbenoid-rich extracts from elicited hairy root cultures of three cultivars of peanut. In Vitro Biology Meeting, San Diego, CA. June 4-7. (poster/oral; 2022 John S. Song Foundation Award).

331. Medina-Bolivar F. 2022. Biotecnología y metabolómica para el descubrimiento y producción de compuestos para la salud de las plantas y humanos. K-14 Workshop on Agricultural Biotechnology, Inter American University of Puerto Rico - Barranquitas, Puerto Rico. June (invited talk).

332. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F**. 2022. Arachidin-1 induces apoptosis and growth inhibition in triple-negative breast cancer cells. 11th Annual Hybrid Conference, American Council for Medicinally Active Plants. Barranquitas/Bayamon, Puerto Rico. June 28-July 2. (poster).

333. Gajurel G, **Medina-Bolivar F**. 2022. Production of cajaninstilbene acid in hairy root cultures of pigeon pea (*Cajanus cajan*) using an optimized elicitation procedure. 11th Annual Hybrid Conference, American Council for Medicinally Active Plants. Barranquitas/Bayamon, Puerto Rico. June 28-July 2. (poster).

334. Mohammadhosseinpour S, Weaver A, Ho L-C, **Medina-Bolivar F**. 2022. Prenylated stilbenoids increase the anticancer efficacy of paclitaxel in triple-negative breast cancer cells. 11th Annual Hybrid Conference, American Council for Medicinally Active Plants. Barranquitas/Bayamon, Puerto Rico. June 28-July 2. (invited talk; 2nd Place Oral Presentation Award).

335. **Medina-Bolivar F**. 2022. Combined elicitation and targeted metabolomics approach for the discovery of medicinally active prenylated stilbenoids in hairy root cultures of peanut and pigeon pea (gandul). 11th Annual Hybrid Conference, American Council for Medicinally Active Plants. Barranquitas/Bayamon, Puerto Rico. June 28-July 2. (invited talk).

336. Le T, Mohammadhosseinpour S, Weaver A, **Medina-Bolivar F**. 2022. Cytotoxicity of the prenylated stilbenoid arachidin-1 from peanut in combination with paclitaxel on triple-

negative breast cancer cells. Ninth Annual Arkansas Summer Undergraduate Research Symposium (ASURS), Little Rock, AR., July 27. (poster; Top 10 Poster Presentation Award).

337. Le T, Mohammadhosseinpour S, Weaver A, **Medina-Bolivar F**. 2022. Arachidin-1 combined with paclitaxel induced reactive oxygen species mitochondria-mediated apoptosis in triple-negative breast cancer cells. ABI Symposium. Fayetteville, AR. October 4. (poster),

338. Weaver A, Mohammadhosseinpour S, Le T, **Medina-Bolivar F**. 2022. Prenylated stilbenoid arachidin-1 mediates apoptosis and enhances the cytotoxic effect of paclitaxel in triple-negative breast cancer cells. ABI Symposium. Fayetteville, AR. October 4. (poster).

339. **Medina-Bolivar F.** 2022. Power Plants: Unearthing the medicinal compounds of plants. Arkansas Research Alliance Project Scope. October 26. (zoom presentation). ARA Project Scope — Research Matters (arkansasvoices4research.com)

2023

340. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F.** 2023. Prenylated stilbenoid arachidin-1 increases the effectiveness of chemotherapy drug paclitaxel in triple-negative breast cancer cells. Arkansas STEM Posters @ the Capitol. Little Rock, AR. February 8. (poster).

341. Mohammadhosseinpour S, Weaver A, Ho L-C, **Medina-Bolivar F.** 2023. Arachidin-1 enhances the anticancer effects of paclitaxel in triple-negative breast cancer cells. American Society for Biochemistry and Molecular Biology Meeting/Experimental Biology. Seattle, WA. March 24-28. (poster).

342. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F**. 2023. Prenylated stilbenoid arachidin-1 increases the effectiveness of chemotherapy drug paclitaxel in triple-negative breast cancer cells. National Conference for Undergraduate Research (NCUR) 2023. Eau Claire, WI. April 13-15. (poster).

343. Weaver A, Mohammadhosseinpour S, **Medina-Bolivar F**. 2023. Peanut extract enriched in stilbenoids inhibits the viability of triple-negative breast cancer cells. Create@AState, Jonesboro, AR. April 18. (oral).

344. Gajurel G, **Medina-Bolivar F**., 2023. Production of isowighteone in hairy root cultures of pigeon pea. Create@AState, Jonesboro, AR. April 18. (oral)

345. Vargas Ulloa J, Gajurel G, **Medina-Bolivar F**. 2023. Production of specialized metabolites with potential health applications in hairy root cultures of annatto. Create@AState, Jonesboro, AR. April 18. (poster)

346. Mohammadhosseinpour S, Weaver A, Ho L-C, **Medina-Bolivar F.** 2023. Arachidin-1 and stilbene-rich extract from peanut induce cell death in human triple-negative breast cancer cells and spheroids. Create@AState, Jonesboro, AR. April 18. (poster – College of Sciences and Mathematics Dean's Graduate Poster Award).

347. Gajurel G, Nopo-Olazabal L, Hendrix E, **Medina-Bolivar**. 2023. Production of Isowighteone in the hairy root cultures of pigeon pea (*Cajanus cajan*) using an optimized elicitation procedure. In Vitro Biology Meeting. Norfolk, VA, June 10-14. (oral – John S. Song Award; Society for In Vitro Biology).

348. **Medina-Bolivar F**. 2023. Biotechnology and Metabolomics: Production and Discovery of Natural Products for Plant and Human Health. K-14 Workshop on Agricultural Biotechnology, Inter American University of Puerto Rico - Barranquitas, Puerto Rico. June 13-17. (invited talk).

349. Salma Abdel-Karim S, Gajurel G, **Medina-Bolivar F**. 2023. Isoflavones from pigeon pea hairy root cultures exhibit cytotoxicity in triple-negative breast cancer cells. ABI Fall Research Symposium. Little Rock, AR. October 4. (poster).

350. Gajurel G, Sharma A, Abdel-Karim S, Alam M, **Medina-Bolivar F**. 2023. Enhanced isoflavone production in pigeon pea hairy root cultures through elicitation. ABI Fall Research Symposium. Little Rock, AR. October 4. (poster).

351. Salma Abdel-Karim S, Gajurel G, **Medina-Bolivar F**. 2023. Anticancer potential of pigeon pea isoflavones in triple-negative breast cancer. ABI Summer Internship Presentations. Jonesboro, AR. October 11. (oral).

352. Sharma A, Gajurel G, Ahmed I, Roedel K, **Medina-Bolivar F**. 2023. Column chromatography and semi-preparative HPLC purification of arachidin-1 and arachidin-3 from elicited hairy root cultures of peanut (*Arachis hypogaea* L.). 12th Annual Conference, American Council for Medicinally Active Plants. Charleston, WV. October 18-21. (poster).

353. Gajurel G, Sharma AR, **Medina-Bolivar F**. 2023. Production of a prenylated stilbene-rich extract from elicited hairy root cultures of peanut and assessment of its bioactivities for human health applications. 12th Annual Conference, American Council for Medicinally Active Plants. Charleston, WV. October 18-21. (contributed talk; 2nd Place Graduate Student Oral Presentation Award).

354. **Medina-Bolivar F**. 2023. Hairy root culture: A sustainable approach for high-level production of bioactive compounds. 12th Annual Conference, American Council for Medicinally Active Plants. Charleston, WV. October 18-21. (invited talk).

2024

355. **Medina-Bolivar F**. 2024. Plant stress: A biotechnological approach for the biosynthesis of natural products. Pre-Congress Webinar. Asociación Mexicana de Investigación en Productos Naturales. January 20. (invited webinar).

356. **Medina-Bolivar F**. 2024. Stress: A biotechnological strategy for the production of plant-derived anti-inflammatory and anticancer compounds. Pharmacology Seminar. Penn State College of Medicine. April 4. (invited webinar).

357. Gajurel G, Sharma A, Abdel-Karim S, Alam M, **Medina-Bolivar F**. 2024. Antioxidant, anticancer, and anti-inflammatory activities of isoflavone-rich extracts from elicited hairy root cultures of pigeon pea. World Congress on In Vitro Biology. June 8-12. (oral).

358. **Medina-Bolivar F**. El estres en las plants: Una estrategia biotecnologica para la produccion de compuestos anti-inflamatorios y anticancerigenos. USDA Agricultural Biotechnology Workshop. Inter American University of Puerto Rico – Barranquitas. June 14. (invited lecturer).

STUDENTS AND ADVISEES

Graduate Students (Since Fall 2005):

1.	Jose Condori Rosales (graduated	A-State	Ph.D.	Molecular Biosciences Spring 11)
2.	Cesar Nopo-Olazabal	A-State	Ph.D.	Molecular Biosciences (graduated Summer 13)
3.	Luis Nopo-Olazabal	UPCH	Ph.D.	Biochem. & Molecular Biology (graduated Summer 10)
4.	Maria Ferrand	A-State	M.S.	Biology (graduated Summer 08)
5.	Shuchi Wu	A-State	M.S.	Biology (transferred to Ph.D. at Virginia Tech)
6.	Swapnali Halder advised;	A-State	M.S.	Biology, Spring-Fall 10 (co- Amy Pierce, main advisor)
7.	Bo Zhai	A-State	P.S.M.	Biotechnology (Fall 10-Summer

12)			
8. Ananddeep Patel	A-State	P.S.M.	Biotechnology (Spring 11-Spring 13)
9. Tianhong Yang	A-State	M.S.	Biology (Fall 11-Spring 13)
10. Tianhong Yang	A-State	Ph.D.	Molecular Biosciences (Fall 13-Fall 16)
11. Carlos Balmaceda	UPCH	Licenciate	Biology (Spring 11-Fall 11)
12. Jodi Burrows	A-State	P.S.M.	Biotechnology (Summer 13)
13. Johnvonta Brooks	A-State	M.A.	Biology (Spring 14-Spring 16)
14. Mohammad Azim	A-State	M.S	Biology (Fall 15-Spring 17)
15. Rahul Yadav	A-State	M.S.	Biology (Fall 15-Spring 16)
16. Abbas Karouni	A-State	M.A. M.S.	Biology (Fall 15-Summer 18) Biotechnology (Fall 18-Summer 19)
17.Patrick Roberto	A-State	M.S.	Biology (Spring 17-Summer 20)
18. Sepideh Mohammadhosseinpour	A-State	Ph.D.	Molecular Biosciences (Spring 18-present)
19.Rokib Hasan	A-State	Ph.D.	Molecular Biosciences (Summer 18-Fall 21)
20.Isabela Brandao de Sousa-Machado	Brazil (Univ. Estado do Rio de Janeiro)	Ph.D.	Fall 18-Spring 19
21. Gaurav Gajurel	A-State	M.S.	Molecular Biosciences (Fall 19-Summer 21)
22. Gaurav Gajurel	A-State	Ph.D.	Molecular Biosciences (Fall 21-present)
23. Chineche Lilian Aniemena	A-State	Doctor	Physical Therapy (Fall 20-Spring 22)

24. Amit Shrivastava	A-State	Ph.D.	Molecular Biosciences (Fall 24-present)
25. Saydul Karim	A-State	M.S.	Molecular Biosiences (Fall 24-present)

Undergraduate Students (since Fall 2005):

1. Rita Diles	A-State	B.S	Nursing, Spring 06
2. Adam Faulkner	Worcester Polytech. Inst.		Summer 06
3. Eric Freeburg	Luther College		RISE Intern, Summer 06
4. Sarah Spulecki	Framingham State College		RISE Intern, Summer 06
5. Kristen Shelton	A-State	B.S.	Chemistry, Fall 07, Spring 08
6. Albert Sawalha	Univ. of Michigan		RISE Intern, Summer 07
7. John Scott Carroll	A-State	B.S.	Biology, Fall 07-Spring 08
8. Melissa Koetzel	Rochester Polytechn. Ins.		RISE Intern, Summer 08
9. Tyler Allen	A-State	B.S.	Biology, Summer 08-Fall 08
10. Jordan Baker	A-State	B.S.	Biology, Summer 08-Spring 10
11. Kristen Long	A-State	B.S.	Biology, Summer 08-Fall 08
12. Kari Panhorst	A-State	B.S.	Biology, Fall 08-Fall 09
13. Michael Young	A-State	B.S.	Biology, Summer 09
14. Richard Lee Atwill 2012	A-State	B.S.	Chemistry, Spring 10-Spring
15. Grant Cagle advised;	A-State	B.S.	Biology, Spring 10-Fall 10 (co- Amy Pierce; main advisor)
16. Zach Marsh	A-State	B.S.	Biology, Summer 11-Spring 13
17. Harold Owiti	Williams Baptist College		Biology, Summer 11

18. Elia Garcia	Univ. of AR, Monticello		Biology, Summer 11
19. Andrew Prince	A-State	B.S.	Biology, Summer 12 (2 weeks)
20. Linda Ogutu	A-State	B.S.	Biology, Summer 12-Spring 13
21. C. Aaron Tollett	A-State	B.S.	Biology/Chemistry, Spring 13-Spring 16
22. Tyler Knapp	A-State	B.S.	Biology, Summer 13-Spring 15
23. Jarrod Creameans	A-State	B.S.	Biology, Fall 13-Summer 16
24. Laura Ramirez	Univ. Auton. Queretaro		Biotechnology, Spring 14
25. Denzel McGregory	A-State	B.S.	Biology, Summer 14
26. Lindsey Gilbert	Univ. of Pikeville		Biology/Chem, Summer 14
27. Sarah Collier	A-State	B.S.	Biology, Spring 15
28. Najwa Lee	A-State	B.S.	Biology, Spring 15; Fall 15-Spring 16
29. Terrance Hendrix	A-State	B.S.	Biology, Spring 15
30. Jordan Miller	Philander	B.S.	Chemistry, Summer 15
31. Carson Day	A-State	B.S.	Biology, Summer 15-Fall 16
32. Krishna Vellanki	A-State	B.S.	Biology, Fall 15-Spring 2019
33. Christine Matei	A-State	B.S.	Biology, Fall 15-Fall 17
34. Alexis Philippe	A-State	B.S.	Biology, Summer 16-Fall 17
35. Parker Knapp	A-State	B.S.	Biology, Fall 16-Fall 19
36. Christopher Owen	A-State	B.S.	Biology, Spring 17
37. Yeream Jeong	Brown	B.S.	Biology, Summer 17
38. Jeremiah Jeffers	A-State	B.S.	Biology, Summer 17

39. Kennith Swafford	A-State	B.S.	Biotechnology, Fall 17-Fall 19
40. Ruth Victoriano	UAFS	B.S.	Biology, Summer 18
41. Mia Lewis	A-State	B.S.	Biology, Summer 18
42. Hailey Campbell	A-State	B.S.	Biology, Summer 18-Fall 18
43. Krystian Roedel	A-State	B.S.	Biology, Fall 18-Spring 22
44. Emily Hendrix	A-State	B.S.	Biology/Chem, Summer 19-Spring 21
45. Izzeldin Ahmed	A-State	B.S.	Biology, Summer 19-Spring 22
46. Sophia Restrepo	A-State	B.S.	Biology, Summer 19; Spring 20
47. Linh-Chi Ho	A-State	B.S.	Biology, Fall 19-Spring 21
48. Cecily Long	A-State	B.S.	Biology, Fall 19-Spring 20
49. Athalie Ventura Espinoza	A-State (Queretaro)	B.S.	Chemistry, Spring 20
50. Carlos Young	A-State	B.S.	Biotechnology, Fall 20
51. Gabriela Huerta	A-State	B.S.	Biology, Fall 20
52. Alexx Weaver	A-State	B.S.	Biology, Summer 21-23
53. Tra Le	A-State	B.S.	Biology, Spring 22-Spring 23
54. Jacqueline Vargas	A-State (Queretaro)	B.S.	Biotechnology, Fall 22-Sum 23
55. Sara Hernandez Madrigal	A-State (Queretaro)	B.S.	Biotechnology, Spr 23-Sum 23
56. Salma Abdel-Karim	A-State	B.S.	Biology Spring 23-present
57. Maya Vick	A-State	B.S.	Biology, Spring 24
58. Carrie Cox	A-State	B.S.	Biotechnology, Summer 24

High School Student:

Kelsey Brown	AR School for Math., Sci. and the Arts	RISE Intern, Summer 06
Laura Amorin	HELP-Centro Hispano (Valley View High School)	Fall 22-Spring 23 (mentee only)
Camila Andrea Ugarte	HELP-Centro Hispano (Jonesboro High School)	Fall 23-Spring 24 (mentee only)

Others advisees:

Postdoctoral Research Associates:

Amit Raj Sharma	A-State	Fall 20-present
Maria Elena Gonzalez	A-State	Fall 18-Fall 19
Tianhong Yang	A-State	Spring 17-Spring 19
Luis Nopo Olazabal	A-State	
Taylor Ingle	A-State	April 12-July 12
Ganapathy Sivakumar	A-State	Spring 07-Spring 08
Tatiana Boluarte	Virginia Tech	
Bonnie Woffenden	Virginia Tech	

Research Assistants/Associates:

Lingling Fang	A-State	Spring 14-present
Yeun-Kyung Chang	A-State	April 12-February 13

Visiting Scientists/Professors:

Gaston Zolla
[Visiting Scientist from Ben-Gurion University, ISRAEL; Training in hairy roots and

phytochemical analyses. Fall 2006]

Jessica Yactayo
[Visiting Scientist from University of Florida; Summer 2006]

Ron Sayler
[Visiting Professor, University of Arkansas, Fayetteville; Training: Hairy roots; Nov 8, 2007]

Lourdes Tapia-Figueroa
[Visiting Professor from Universidad Nacional Agraria La Molina (UNALM), PERU; Project: Establishment and phytochemical analyses in hairy roots; Sep 2007]
Note: Professor Tapia-Figueroa's visit was part of an International Agreement signed between ASU and UNALM. Dr. Medina-Bolivar coordinated this agreement.

Nestor Cabrera
[Visiting Student; Universidad Peruana Cayetano Heredia, PERU; May 21, 2007]

Hector Villagarcia
[Visiting Scientist from Spectra Solutions SAC, Peru; Project: Elicitation of secondary metabolites in hairy roots; Fall 2007 to Spring 2009]

Carlos Balmaceda Cuenca
[Visiting Researcher from Universidad Peruana Cayetano Heredia, Peru; Project: *Agrobacterium* transformation and peanut stilbenoids; November 2010; February 2011-August 2011; May 2024 to present]

Daria Adamenko
Project: Bioproduction and commercialization of hairy root-derived natural products.
[Fall 2011 to Summer 2012]

Raul Blas Sevillano
[Visiting Professor from Universidad Nacional Agraria La Molina, Lima, Peru: January 16-February 3, 2012]

Ayesha Siddiqua
[Visiting Medical Doctor from Bangladesh; August 2016-to date]

Graduate Student National and Regional Awards:

Jose Condori – 2010 - 1st Annual Conference of the American Council for Medicinally Active Plants, Rutgers, NJ. (1st Place Graduate Poster Award).

Jose Condori – 2011 - qPCR and Data Mining Symposium, San Francisco, CA. (2nd Place Poster Award)

Tianhong Yang – 2012 - 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. (1st Place Graduate Poster Award).

Abbas Karouni – 2018 – Create@State (1st Place Graduate Poster Award – College of Sciences and Mathematics)

Patrick Roberto – 2019 - Create@State (1st Place Graduate Poster Award – College of Sciences and Mathematics)

Abbas Karouni – 2019 – Create@State (1st Place Graduate Poster Award – College of Sciences and Mathematics)

Rokib Hasan – 2019 - Cellular Toxicologist Award – In Vitro Biology Meeting. Tampa, FL.

Sepideh Mohammadhosseinpour-2019-ABI Fall Research Symposium - 1st Place Graduate Poster Award

Rokib Hasan – 2020 – 1st Place Graduate Poster Award – Create@State (virtual conference).

Sepideh Mohamadhosseinpour – 2020 – Cellular Toxicologist Award – World Congress on In Vitro Biology (virtual conference)

Sepideh Mohammadhosseinpour – 2020 – 2nd Place Graduate Student Oral Presentation Award – World Congress on In Vitro Biology (virtual conference)

Sepideh Mohammadhosseinpour – 2021 - Create@AState. Dean's Award for Graduate Poster Presentation, College of Sciences and Mathematics.

Sepideh Mohammadhosseinpour – 2021 -10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. 1st Place Award Graduate Poster.

Rokib Hasan – 2021 -10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. 1st Place Award-Graduate Oral.

Sepideh Mohammadhosseinpour – 2021 - Sigma Xi Annual Meeting and Student Research Conference. Cell Biology and Biochemistry Graduate Award

Undergraduate Student National and Regional Awards:

Richard Lee Atwill – 2011 Undergraduate Research Grant – American Society of Pharmacognosy; $ 2,500

Zachary Marsh – 2012 – 3rd Annual Conference of the American Council for Medicinally Active Plants. Jonesboro, AR. Poster. First Place Undergraduate Poster Award.

Linda Ogutu – 2013 Undergraduate Travel Fund – American Chemical Society National Meeting/Division of Agricultural and Food Chemistry, New Orleans, LA - $ 1,000

Linda Ogutu – 2013 – Undergraduate Research Symposium. American Chemical Society/Division of Agricultural and Food Chemistry, New Orleans, LA. Invited Talk. Second Place Award.

Christopher Aaron Tollett – 2014 Undergraduate Travel Fund - American Chemical Society/Division of Agricultural and Food Chemistry. Dallas, TX. $ 1,000

Christopher Aaron Tollett – 2014. Undergraduate Research Symposium. American Chemical Society/Division of Agricultural and Food Chemistry. Invited Talk. First Place Award.

Tyler Knapp – 2015. Undergraduate Travel Fund - American Chemical Society/Division of Agricultural and Food Chemistry. Denver, CO. $ 1,000

Jarrod Creameans – 2015. 6th Annual Conference of the American Council for Medicinally Active Plants, Spokane, WA. First Place Undergraduate Poster Award.

Jarrod Creameans – 2016. Undergraduate Travel Fund - American Chemical Society/Division of Agricultural and Food Chemistry. San Diego, CA. $ 1,000

Jarrod Creameans – 2016. Undergraduate Research Symposium. American Chemical Society/Division of Agricultural and Food Chemistry. Invited Talk. Second Place Award.

Jarrod Creameans – 2016. 7th Annual Conference of the American Council for Medicinally Active Plants, Lima, Peru. Second Place Oral Presentation Award.

Emily Hendrix – 2020. Create@State (virtual conference)- 1st Place Undergraduate Oral Presentation Award.

Izzeldin Ahmed – 2020. Arkansas INBRE Virtual Research Conference. Biology poster/talk. Honorable Mention Award.

Linh-Chi Ho – 2020. Arkansas INBRE Virtual Research Conference. Biology poster/talk. 1st Place Award.

Linh-Chi Ho - 2021. Create@AState. Dean's Award for Undergraduate Oral Presentation, College of Sciences and Mathematics.

Izzeldin Ahmed - 2021. 10th Annual and 1st Virtual Conference of the American Council for Medicinally Active Plants. 2nd Place Award Undergraduate Poster.

THESIS AND DISSERATION COMMITTEES

Dissertation Committee Chair

Jose Condori

Dissertation title: "Identification and characterization of a stilbene synthase gene family in peanut hairy roots."
Ph.D. in Molecular Biosciences
Arkansas State University
Dissertation defended in April 2011

Luis Nopo-Olazabal

Dissertation title: "Evaluation of a recombinant protein expression system based on the Super-promoter:TEV and the green fluorescent protein in tobacco (*Nicotiana tabacum* L.) leaves and hairy roots"
Ph.D. in Biochemistry and Molecular Biology
Universidad Peruana Cayetano Heredia (UPCH), Lima, Peru
Dissertation defended in February 2011
Note: F. Medina-Bolivar, Major Research Advisor

Cesar Nopo-Olazabal

Dissertation title: "Differential biosynthesis of antioxidant stilbenoids in hairy root cultures of muscadine grape and peanut treated with methyl jasmonate and hydrogen peroxide"
Ph.D. in Molecular Biosciences
Dissertation defended in June 2013

Tianhong Yang

Dissertation title: "Biosynthesis enhancement of prenylated stilbenoids and molecular cloning and characterization of stilbenoid prenyltransferases from peanut hairy roots"
Ph.D. in Molecular Biosciences
Candidacy exam defended in November 2015
Dissertation defended in Fall 2016

Sepideh Mohammadhosseinpour

Dissertation title: "Cytotoxic mechanism of prenylated stilbenoids in breast cancer cells"
Ph.D. in Molecular Biosciences
Start date: Spring 2018
Dissertation Proposal (Qualifying Exam) defended Fall 2019
Candidacy Proposal defended Fall 2020

Rokib Hassan

Dissertation title: "Manipulation of prenylated stilbenoid biosynthesis by genome editing and post-transcriptional gene silencing and anti-inflammatory effects of prenylated stilbenoids"
Ph.D. in Molecular Biosciences
Start date: Summer 2018

Dissertation Proposal (Qualifying Exam) defended Fall 2018
Candidacy exam defended Fall 2019

Gaurav Gajurel
Ph.D. in Molecular Biosciences
Start date: Fall 2021

Master Thesis and Master Arts Committee Chair

Maria Ferrand-Malatesta
Thesis title: "Analysis of constitutive and inducible specialized metabolites in tissues and hairy root cultures of annatto (*Bixa orellana* L.)
M.S. in Biology
Thesis defended in 2008

Tianhong Yang
Thesis title: "Metabolic engineering of flavonoid biosynthesis in *Scutellaria lateriflora* hairy roots by ectopic expression of the AtMYB12 transcription factor"
M.S. in Biology
Thesis defended in Spring 2013

Mohammad Azim
Thesis title: "Expression of peanut resveratrol prenyltransferase in muscadine grape"
M.S. in Biology
Thesis defended Summer 2018

Abbas Karouni
Practicum
M.A. in Biology

Patrick Roberto
Thesis title: "Assessment of the antioxidant and anti-inflammatory activity of prenylated stilbenoids and stilbenoid-rich extracts from peanut hairy roots"
M.S. in Biology
Thesis defended Spring 2020

Gaurav Gajurel
Thesis title: "Assessing the role of prenylated stilbenoids on abiotic stress in peanut"
M.S. in Molecular Biosciences
Thesis defended Summer 2021

Honors Senior Thesis Chair

Carlos Balmaceda

Thesis title: "Efecto del metil jasmonato y la ciclodextrina en la producción de estilbenoides en cultivos de raíces en cabellera de maní"
Licenciate in Biology
Universidad Peruana Cayetano Heredia, Lima, Peru
Thesis defended: December 2011

Linda Ogutu

Thesis title: "Biosynthesis enhancement of arachidin-1 in peanut hairy root cultures and assessment of its cytotoxicity in pheochromocytoma (PC12) cells"
B.S. in Biology
Arkansas State University
Thesis defended: May 2013

Zach Marsh

Thesis title: "Effect of methyl jasmonate and cyclodextrin on production of polyphenolic compounds in hairy root cultures of *Scutellaria lateriflora"*
B.S. in Biology
Arkansas State University
Thesis defended: April 2013

Tyler Knapp

Thesis title: "Production of stilbenoids in hairy root cultures of muscadine grape"
B.S. in Biology
Arkansas State University
Thesis defended: Spring 2015

Jarrod Creameans

Thesis title: "Bioproduction and anti-inflammatory activity of delta-tocotrienol enriched extracts from hairy roots of annatto"
B.S. in Biology
Arkansas State University
Thesis proposal defended: November 2015
Thesis defended: Spring 2016

Najwa Lee

Thesis title: "Hairy roots as potential scaffolds for mammalian stem cell cultures"
B.S. in Interdisciplinary Studies
Arkansas State University
Thesis proposal defended: December 2015
Thesis defended: Spring 2016

Kennith Swafford

Thesis title: "Optimization of elicitation treatment in hairy root cultures of peanut"
B.S. in Biotechnology
Arkansas State University
Thesis defended: Fall 2019

Linh-Chi Ho
Thesis title: “Effect of arachidins on the anticancer effect of paclitaxel in triple-negative breast cancer cells”
B.S. in Biology
Arkansas State University
Thesis defended: Spring 2020

Alexx Weaver
Thesis title: “Anticancer potential of a stilbene-rich extract in triple-negative breast cancer”
B.S. in Biotechnology
Thesis defended: Spring 2024

Committee Member:

Dissertations (Committee Member)

Haitao Zhang
Dissertation title: “Phosphor-Regulation of Mammalian CAP1 (Cyclase Associated Protein 1) Function in Actin Dynamics”
Ph.D. in Molecular Biosciences
Committee member period: Fall 2014-Fall 2016
Dissertation defended: Fall 2016
Main advisor: Guolei Zhou

Carlos Rosado-Berrios
Dissertation title: “Water Quality Assessment of the Lower Cache River-Watershed”
Ph.D. in Environmental Sciences Committee member period: Fall 2014-to date
Committee member period: Spring 2013-Summer 2018
Dissertation defended: Summer 2018
Main advisor: Jennifer Bouldin

Swapnali Halder
Dissertation title: “Estrous Cycle and on the Ovary and Uterus of Female Sprague-Dawley Rats”
Ph.D. in Molecular Biosciences
Committee member period: Fall 2012-May 2015
Dissertation defended: Spring 2015
Main advisor: Amy Pierce

Nirman Nepal
Dissertation Title: “Phenomics and Transcriptomics Study of High Ascorbate Arabidopsis in Response to Biotic Stress”
Ph.D. in Molecular Biosciences
Committee member period: Spring 2016-to date

Dissertation defended: Fall 2019
Main advisor: Argelia Lorence

Rebecca Cooper
Ph.D. in Environmental Sciences
Committee member
Main advisor: Thomas Risch – Jennifer Bouldin
(student withdrew program in Fall 2023)

Uddhab Karki
Ph.D. in Molecular Biosciences
Committee member period: Spring 2019-to date
Dissertation defended: Summer 2022
Main advisor: Jianfeng Xu

Sankalpa Chakraborty
Ph,D, in Molecular Biosciences
Co-Chair with Dr. Viswanathan Rajagopalan
Start date: Fall 2019

Kharla Mendes
Ph.D. in Molecular Biosciences
Committee member period: Fall 2019-to date
Dissertation Proposal defended: Spring 2020
Dissertation defended: Spring 2024
Main advisor: Argelia Lorence

Brett Hale
Ph.D. in Molecular Biosciences
Committee member period: Fall 2020-Fall 2023
Dissertation defended: Fall 2023
Main advisor: Asela Wijeratne

Corbin England
Ph.D. in Molecular Biosciences
Committee member period: Fall 2021-Summer 2023
Main advisor: Jianfeng Xu
(student withdrew program in Summer 2023)

Master Thesis (Committee Member)

Ashley Flory

Thesis title: "Development of an Environmentally Friendly Binder System for Paper Products"
M.S. in Biology
Thesis defended: 2011
Main advisor: Elizabeth Hood

John Kilmer
Thesis title: "Characterization of chemical profiles produced by *Opuntia humifusa* in response to herbivory and exogenous methyl jasmonate in comparison to hairy root cultures.
M.S. in Biology
Thesis defended: Summer 2016
Main Advisor: Travis Marsico

Hazel Berrios
Thesis title: "Diversity and morphology patterns of vascular epiphytes along an elevation gradient in the tropical montane forest of Volcán Maderas, Nicaragua"
M.S. in Biology
Thesis defended: Spring 2019
Main advisor: Travis Marsico

Raveena Ratnayake
Main advisor: Sudeepa Bhattacharrya
M.S. in Molecular Biosciences
Fall 2023-present

Honor Thesis (Committee Member)

Madelyn Carson
B.S. in Biology
Thesis defended: Spring 2019
Main advisor: Maureen Dolan

TEACHING EXPERIENCE:

Course	Semester taught	Percent responsibility
MBS/BIOL/CHEM 6233; **Specialized Biochemistry** 3 credits, Graduate	Spring 2007 Spring 2008 Spring 2009 Spring 2010 Spring 2011 Spring 2012	100% 100% 100% 100% 100% 100%

	Spring 2013 Spring 2014 Spring 2015 Spring 2017 Spring 2019 Spring 2021 Spring 2023	100% 100% 100% 100% 100% 100% 10%
BIO 4513/5513 **Plant Physiology** Undergraduate/Graduate 3 credits	Fall 2015 Fall 2017	100% 100%
BIO 2011: **Biology of the Cell Laboratory** Undergraduate 1 credit	Fall 2014 – section 1 Spring 2015 – sections 2&3 Fall 2015 – section 1 Spring 2016 – sections 2&3 Fall 2016 – section 1 Spring 2017 – sections 2&3 Fall 2017 – section 1 Spring 2018 – section 2&3 Fall 2018 – sections 1&2 Spring 2019 – section 2 Fall 2019 – sections 4&5 Fall 2020 – sections 4&5 Spring 2021 Fall 2021 – section 1 Spring 2022 – section 1	100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%
BIO 4063/5063 **Biosafety & Ethics in Research** Undergraduate/Graduate 3 credits	Fall 2016 Fall 2018 Fall 2019 Fall 2020 Fall 2021 Fall 2022 Fall 2023	100% 100% 100% 100% !00% 100% 100%
BIO 4053/5053 **Applications in Biotechnology** Undergraduate/Graduate 3 credits	Spring 2018 Spring 2019 Spring 2020 Spring 2021 Spring 2022 Spring 2023 Spring 2024	50-100% Guest lecture Guest lecture Guest lecture Guest lecture Guest lecture Guest lecture

MBS 6251; **Techniques in Molecular Biosciences: "Hairy Roots: Culture and Applications"** 1 credit, Graduate	Fall 2008	100%
MBS 7123; **Topics in Molecular Biosciences** 3 credits, Graduate	Spring 2007	20% (team-taught)
MBS 6213; **Advanced Cell Biology** 3 credits, Graduate	Spring 2008 Spring 2009 Spring 2010 Spring 2011 Spring 2012 Fall 2012 Fall 2014 Fall 2016 Fall 2018 Fall 2020 Fall 2021 Fall 2022	(guest lecturer) (guest lecturer) (team-taught) (team/guest-taught) (team-taught) (team taught) (team taught) (team taught) (team taught) (team taught) (team taught) (team taught)
ESCI 7121; **Topics in Environmental Sciences: "Phytoremediation"** 3 credits, Graduate	Fall 2006	20% (team-taught)
BIOL 4441/BIOL 5441; "**Hairy Roots"** 1 credit, Undergraduate/Graduate, 3 students	Summer II 2006	50%
BIOL 4391/493V/BIO 403V; **Special Problems** 1-3 credits, Undergraduate, 1-3 students	Spring 2006 to Fall 2021	100%
BIOL 680V/MBS 713V; **Independent Studies/Research** 1-3 credits, Graduate	Fall 2006 to Fall 2021	100%
MBS 6251: **Techniques in Molecular Biosciences: "HPTLC and HPLC"**	Fall 2011	50%
Human Genetics	Nov 30, 2011 Nov 4, 2013	Guest lecture Guest lecture

MBS 6251**: Techniques in Molecular Biosciences: "Plant Transformation"**	Fall 2012	50%
Biotechnology in a Global Society	February 26, 2014 Spring 2019 Spring 2020 Spring 2021 Spring 2023 Spring 2024	Guest lecture Guest lecture Guest lecture Guest lecture Guest lecture Guest lecture
MBS 6251: **Techniques in Molecular Biosciences: "HPLC"**	Summer 2023	50%
ESCI 7111: **Seminar in Environmental Sciences**	Fall 2023 Spring 2024	100% 100%
MBS 6251: **Techniques in Molecular Biosciences: "Plant Genetic Transformation"**	Spring 2024	100%