

CURRICULUM VITAE

Argelia Lorence, Ph.D.

Assistant Professor in Metabolic Engineering
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Birth date and place of birth

September 4, 1969, Mexico City, México

Languages

English, Spanish

Education

PhD, Biotechnology (December, 1997) *Instituto de Biotecnología (IBT), Universidad Nacional Autónoma de México (UNAM)*, Cuernavaca, México. Advisor: Prof. Alejandra Bravo. Dissertation: "Analysis of the Pore-forming Activity of *Bacillus thuringiensis* Cry Proteins in the Presence of their Native Receptor".

MS, Biotechnology (March, 1995), *Instituto de Biotecnología (IBT), Universidad Nacional Autónoma de México (UNAM)*, Cuernavaca, México. Advisor: Prof. Rodolfo Quintero-Ramírez. Dissertation: "Design of a Novel Screening Method for New *Bacillus thuringiensis* δ -Endotoxins".

BS, Biochemical Engineering, *Universidad Autónoma Metropolitana- Iztapalapa (UAM-I)*, México, 1991.

Continuous education

"Finding Out How Well Students Are Learning What We Are Teaching: An Introduction to Classroom Assessment", and "Making Real the Scholarship of Teaching and Learning: Developing Your Own Classroom Research Agenda". Presenter Dr. Thomas Angelo from Victoria University of Wellington, New Zealand. Workshops organized by Mrs. Barbara Doyle, Director of Assessment Arkansas State University, Jonesboro, April 4, 2007.

"Designing Courses for More Significant Learning Experiences" organized by the Office of Research and Academic Affairs. Presenter Dr. Dee Fink, author of the book "*Creative Significant Learning Experiences: An Integrated Approach to Designing College Courses*", Arkansas State University, Jonesboro, September 14, 2006.

"Coaching Strong Women in the Art of Strategic Persuasion" organized by the Committee On the Advancement of Women Chemists (COACh) Annual Spring Meeting of the American Chemical Society. Atlanta, GA, March 25, 2006.

"Communicating Science to the Public" organized by Drs. Aldemaro Romero and Amy Pierce, Arkansas State University, Jonesboro, March 4, 2006.

"Process Oriented Guided Inquiry Learning in the Classroom and the Laboratory" SE-SW Joint Regional Meeting of the American Chemical Society, Peabody Hotel, Memphis, TN, November 4th, 2005. Inter-Agency Conference on Metabolic Engineering 05, February 3, 2005. National Science Foundation. Arlington, VA.

"Realizing the Vision: Leading Edge Technologies in Biological Systems" organized by the National Science Foundation. December 13-14, 2004. Cosmos Club, Washington, D.C.

Inter-Agency Conference on Metabolic Engineering 2004. February 6, 2004. National Science Foundation. Arlington, VA.

Training course for scientists to facilitate their abilities to communicate science to the media imparted by Fleishman-Hillard of Mexico. Organized by *AgroBio México* and the Mexican Society of Biotechnology and Bioengineering (*SMBB*). September 9, 2001, Veracruz, México.

"Biosynthesis of Plant Secondary Metabolites" imparted by Prof. Robert Verpoorte. Organized by *CINVESTAV-IPN*. July 23-25 2001, Mexico City, México.

- “Cloning and characterization of strictosidine synthase from *Camptotheca acuminata* cell cultures”, visiting scientist, laboratory of Dr. Edmundo Lozoya-Gloria, *Centro de Investigación y Estudios Avanzados del Instituto Politécnico Nacional*, CINVESTAV-Irapuato, June 19 - July 9 1999, Irapuato, México.
- “3rd International Symposia of Phytomedicines” Organized by *Instituto Mexicano del Seguro Social (IMSS)* and Farmasa Schwabe. May 21 1999, Mexico City, México.
- “Priorities of Research and Development in Agrobiotechnology” Organized by *Centro Para la Innovación Tecnológica/UNAM*. September 24-25 1993, Mexico City, México.
- “3rd Advanced Course of Biotechnological Processes: Scale-Up” Organized by Biotechnology Program for Latin America and the Caribbean/UNIDO, *IBT/UNAM*, and *CEIB/UAEM*, October 12-23, 1992, Cuernavaca, México.

Professional Experience

- August 2005 to present *Tenure-Track Assistant Professor in Metabolic Engineering*
 Arkansas Biosciences Institute (ABI), Arkansas State University (ASU), Jonesboro, AR.
- Study of the role of ascorbate in the control of aging and reproductive activity in plants.
 - Study and manipulation of the vitamin C – cell wall metabolic network in *Arabidopsis thaliana* (collaboration with Dr. Craig Nessler, Virginia Tech, Blacksburg, VA)
 - Study of the role of ascorbate at conferring plants tolerance to environmental pollutants
 - Metabolite profiling of the vitamin C metabolic network in plants (collaboration with Dr. Robyn Hannigan, ASU-Chemistry and Physics)
 - Survey of the vitamin C foliar content of plants of the mustard family growing in Arkansas (collaboration with Dr. Staria Vanderpool, ASU-Biological Sciences)
 - Survey about fruits and vegetable consumption among college students in Arkansas and Florida (collaboration with Dr. Christiane Schroeter, ASU-College of Agriculture, and Dr. Lisa O. House, University of Florida-Food and Resource Economics)
 - Metabolic engineering of phytoalexins produced by tobacco and *Hyoscyamus muticus* hairy root cultures (collaboration with Dr. Fabricio Medina-Bolivar, ASU-ABI)
 - Metabolic engineering of triterpenes with sedative properties produced by *Galphimia glauca* cell and hairy roots cultures (collaboration with Dr. María Luisa Villarreal (*CEIB-UAEM*, Cuernavaca, México).
 - Study of the pore-forming activity of resin glycosides (collaboration with Dr. Rogelio Pereda-Miranda, *Facultad de Química-UNAM*, Mexico City, México)
 - Metabolic engineering for the enhancement of nutritional and agronomical traits of rice varieties (collaboration with Dr. Gregory Phillips, ASU-Agriculture, and Dr. Helen Miller, USDA-Stuttgart, AR).
 - Use and development of analytical tools to measure antioxidant activity of plant extracts
 - Metabolite profiling of plant extracts as fingerprints for forensic applications
 - Molecular speciation of selected Mexican medicinal plants (collaboration with Dr. Rachel Mata, *Facultad de Química-UNAM*, Mexico City, México)
 - Harnessing the potential of plant genomics for the detection and remediation of explosives and chemical weapons (collaboration with Dr. Robyn Hannigan, ASU-Chemistry and Physics)
 - Extensive teaching and mentoring activities (high school, undergraduate and graduate students)
- April 2002 – July 2005 *Post-doctoral Research Associate*, Department of Plant Pathology, Physiology and Weed Science (PPWS), Virginia Tech, Blacksburg, VA
- Discovery and study of a new biosynthetic pathway for vitamin C in plants using *myo*-inositol as a precursor
 - Metabolic engineering of the vitamin C biosynthetic network in *Arabidopsis* and crop plants
 - Metabolic engineering of the biosynthetic pathway of opiates in opium poppy (*Papaver somniferum*).
 - Extensive advising and mentoring of laboratory technicians, graduate and undergraduate students, visiting scholars and summer interns
- April 1998- March 2002 *Assistant Professor*, *Centro de Investigación en Biotecnología (CEIB)*, *Universidad Autónoma del Estado de Morelos (UAEM)*, Cuernavaca, México.

- Metabolic engineering of the indole alkaloid pathway in *Camptotheca acuminata* cell cultures. This research was funded via a Grant Award for Young Investigators (equivalent of the CAREER-NSF award) to A Lorence (PI) from *Consejo Nacional de Ciencia y Tecnología* (CONACYT)-Mexico (1999-2001)
- Set-up of a laboratory of metabolic engineering in the Department of Natural Products at *CEIB/UAEM*
- Extensive teaching and mentoring activities (undergraduate and graduate students)

August 2000 – June 2001 *Visiting Scientist*, Department of Plant Pathology, Physiology and Weed Science (PPWS), Virginia Tech (VT), Blacksburg, VA

- Metabolic engineering of indole and opiate alkaloid biosynthetic pathways.
- Development of *C. acuminata* hairy roots (collaboration with Dr. Fabricio Medina-Bolivar).
- Move and set-up of the Nessler lab at Virginia Tech and training of all new personnel.

January - July 2000 *Visiting Scientist*, Department of Biology, Texas A&M University (TAMU), College Station, TX

- Metabolic engineering of indole-alkaloid biosynthesis: activation tagging of *C. acuminata* to identify transcription factors that regulate the pathway

Awards and honors

- 2007 C. Schroeter, LA House and A Lorence. *Fruits and Vegetable Consumption among College Students in Arkansas and Florida: Food Culture vs. Health Knowledge*. Work nominated to *Best Paper Award* in the Agribusiness Symposium. 17th Annual World Forum and Symposium: Food Culture: Tradition, Innovation and Trust- A positive Force for Modern Agribusiness. Parma, Italy, June 23-26.
- 2006 Featured mentor in the book *The Paths We Tread II*, Minority Environmental Leadership Development Initiative (MELDI), University of Michigan.
- 2006 Member Sigma Xi, June 2006 to present.
- 2006 Travel Award, Committee on the Advancement of Women Chemists (COACH).
- 2002 Arthur Neish Young Investigator Award, Phytochemical Society of North America (PSNA).
- 2002 Post-doctoral Travel Award, Virginia Tech.
- 2000 Post-doctoral Fellowship, *UAEM*, México.
- 1999-2001 Young Investigator Award (equivalent of the CAREER-NSF award) *Consejo Nacional de Ciencia y Tecnología*, (CONACYT), México
- 1999 Teaching Award, *Facultad de Biología, Universidad Autónoma del Estado de Morelos*.
- 1998 "Alfonso Caso Medal" 1st place PhD, class of 1997, *UNAM*, México.
- 1997 "Gabino Barreda Medal" 1st place MS, class of 1995, *UNAM*, México.
- 1995-2001 Scholar, *Sistema Nacional de Investigadores (SNI)*, México.
- 1992-1997 Scholar, *CONACYT*, México. Funding for MS and PhD studies.
- 1993 1st place "Maestro Jesus Silva Herzog Economy Award" Participant in the winner project: "The Technological Change in the Mexican Agriculture and Agro-industry".

Research sponsors

Current

Title: "Role of Ascorbate in Coordinating Growth and Senescence in *Arabidopsis thaliana*"
 Agency: Arkansas IDeA Network of Biomedical Research Excellence (Arkansas INBRE), National Institute of Health (NIH)
 A Lorence (PI)
 Sub-award No. 30665: \$95,137.00 (May 1 2006, April 30, 2007)
 Total sub-award: \$603,574.00 (January 2006 - December 2010)
 General Award No. NIH-NCCR 5 P20 RR016460-05 to L Cornett "Partnerships for Biomedical Research in Arkansas" (May 1 2005 – April 30, 2010).

Title: "Study and manipulation of the vitamin C – cell wall metabolic network for the development of plants with enhanced nutritional and agronomical properties"

Agency: Arkansas Biosciences Institute

A Lorence (PI)

Award: \$200,000.00 (August 2005 - June 2007, set-up package).

Title: "Unraveling Sedative Triterpene Synthesis in *Galphimia glauca*: Phytochemistry and Functional Genomics Join Forces"

Agency: Faculty Research Fund, Arkansas State University

A Lorence (PI)

Award: \$6,500.00 (July 1st 2006 - June 2008).

Title: Collaborative Seed Grant: Mechanisms of Toxicity and Remediation of "Superfund" Environmental Toxicants"

Agency: Arkansas Biosciences Institute, Arkansas State University

A Lorence, F Medina-Bolivar and K Redeker (Co-PIs)

Award: \$30,000.00 (July - December 2006).

Title: Funding to attend "Workshop on HPTLC-MS", October 9-11, 2006, Berlin, Germany

Agencies: ASU Sponsored Research Assistance and ASU Research Foundation

A Lorence (PI)

Award: \$2,000.00 (July - October 2006).

Title: "Developing an Immunotoxicology Center in Arkansas"

Agency: Arkansas Biosciences Institute at the Arkansas Children's Hospital Research Institute (ACHRI)

K Gilbert (PI), S Blossom, and B Przybyla (ACHRI), N Pumford (University of Arkansas at Fayetteville), J Fuscoe (National Center for Toxicological Research), F Medina-Bolivar, K Redeker, and A Lorence (Arkansas State University).

Award: \$200,000.00 (July 1, 2007 – June 30, 2008).

Pending

Title: "Novel plant metabolic engineering strategies to drive TCE/PAH phytoremediation"

Agency: National Institute of Health RFA-ES-06-003 Superfund Basic Research and Training Program (P42)

A Lorence (Project Leader), C Cramer, F Medina-Bolivar and K Redeker (Co-leaders)

Program Grant: "Superfund Chemical Research in Arkansas"

Jack Hinson (PI) and Anna Radomska-Pandya (Co-PI)

Amount requested for ASU component: \$1,395,501.00 (04/01/2008 to 03/31/2013)

Submitted: March 2007 (NIH ID # 7388548).

Title: "Undergraduate Research and Mentoring in the Biological Sciences: Cross-disciplinary Research at the Intersection of Biotechnology and the Environment"

Agency: National Science Foundation – Undergraduate Research and Mentoring in the Biological Sciences

R Hannigan (PI), Roger Buchanan (Co-PI)

A Lorence one of 10 faculty mentors participating in two areas of this project: molecular diagnostics and metabolite identification

Pre-proposal submitted: Oct 30, 2006

Full proposal submitted: March 6, 2007 (Proposal No. 0731603)

Amount requested: \$1,122,685.00 (01/15/2008 – 12/15/2013)

Title: "Arkansas ASSET Initiative"

Agency: NSF EPSCoR Research Infrastructure Improvement Program (EPS 07-01870)

Plant Bioproduction Project headed by CL Cramer (Arkansas State University), Gary Thompson (University of Arkansas, at Little Rock) and Kenneth Korth (University of Arkansas at Fayetteville)
Amount requested: \$9,000,000 (May 2007- April 2010)

A Lorence is one of 21 researchers participating in this statewide project.

Title: "Beckman's Scholars Program at Arkansas State University"

Agency: Beckman Foundation

Al Romero (PI), R Hannigan (Co-PI), J Pratte (Co-PI)

A Lorence one of 12 Beckman scholar mentors participating in the program

Budget: \$60,000/year (2007-2011).

Title: "The Study of Gene Amplification Process in Plants"

Agency: Human Frontier Science Program (HFSP)

M Miele (Advanced Biotechnology Center, University of Genoa, Genoa, Italy) and A Lorence (ABI, ASU)

Letter of intent: April 3, 2007.

Past

Title: "Metabolic Engineering for the Discovery of Human Therapeutics in Tobacco"

Agency: Tobacco Initiative Fund, Virginia Tech

F Medina-Bolivar (PI), and A Lorence (Co-PI)

Award: \$29,000.00 (November 2004 - July 2005).

Title: "Transformation of *Camptotheca acuminata* Cell Lines for the Production of Camptothecin, A Terpene with Anticancer and Antiretroviral Activities"

Agency: *Consejo Nacional de Ciencia y Tecnología (CONACYT)*, México

Young Investigator Award Project, A Lorence (PI)

Award: \$100,000.00 (January 1999 - December 2001).

Title: "Characterization of Regions in the Domain I of *Bacillus thuringiensis* Cry Proteins Involved in Their Pore- Forming Activity"

Agency: *Dirección General de Estudios de Posgrado, UNAM*, México

A Lorence (PI)

Award: \$4,000.00 (1995 - 1997).

Consulting

November 01 – March 02

Bioskinco, SA de CV, Mexican biotechnological company producer of "*Epifast*" skin substitute for the treatment of diabetic foot, burns and other skin conditions. Main activity: preparation of grant proposals to the Mexican government.

1995-1998

CAMBIOTEC, initiative of the International Development Research Center (IDRC, Canada).

International network with the mission to facilitate biotechnology-based applications in the agri-food and environmental management fields in Latin America. Advisor: Dr. José Luis Solleiro-Rebolledo.

Main activity: development of "state of the art" reports published in Spanish and distributed in México, Colombia, Chile, Argentina and Canada. Topics: biopesticides (1996), potato (1997) and agrobiologicals (1998).

October 91 – January 92

Advisor: Prof. Rodolfo Quintero-Ramírez, Director of the Biotechnology Regional Program for Latin America and the Caribbean of the United Nations (UNIDO). Main activities: design of an industrial plant to produce *Bacillus thuringiensis*-based biopesticides to satisfy the demand of the countries of "Pacto Andino" (Bolivia, Colombia, Ecuador, Peru, and Venezuela). Make a directory of Mexican biotechnological companies.

Scientific publications (English) (*student authors)

Peer-reviewed publications

1. C Schroeter, LA House and A Lorence (2007) Fruits and Vegetable Consumption Among College Students in Arkansas and Florida: Food Culture vs. Health Knowledge. 17th Annual World Forum and Symposium: Food Culture: Tradition, Innovation and Trust- A positive Force for Modern Agribusiness. Parma, Italy, June 23-26. Work nominated to *Best Paper Award, XVII IAMA Symposium, Parma, June 2007 (Submitted)*.
2. A Lorence, P Mendes, BI Chevone and CL Nessler (2004) *myo*- Inositol Oxygenase Offers a Possible Entry Point into Plant Ascorbate Biosynthesis. *Plant Physiology* 134: 1200-1205.
3. A Lorence, F Medina-Bolivar and CL Nessler (2004) Camptothecin and 10-Hydroxycamptothecin from *Camptotheca acuminata* Hairy Roots. *Plant Cell Reports* 22: 437-441.
4. A Lorence and CL Nessler (2004) Camptothecin, Over Four Decades of Surprising Findings. *Phytochemistry* 65: 2735-2749. Review paper by invitation to section Molecules of Interest.
5. A Lorence and R Verpoorte (2004) Gene Transfer and Expression in Plants. *Methods in Molecular Biology* 267: 329-350.
6. J Radzio*, A Lorence, BI Chevone, and CL Nessler (2003) L-Gulonolactone Oxidase Expression Rescues Vitamin C Deficient Arabidopsis (*vtc*) Mutants. *Plant Molecular Biology* 53: 837-844.
7. M Soberón, RV Pérez, ME Núñez-Valdéz, A Lorence, I Gómez, J Sánchez, and A Bravo (2000) Evidence for Intermolecular Interaction as a Necessary step for Pore-Formation Activity and Toxicity of *Bacillus thuringiensis* Cry1Ab Toxin. *FEMS Microbiology Letters* 191: 221-225.
8. A Lorence, Darszon A, and A Bravo (1997) Aminopeptidase Dependent Pore Formation of *Bacillus thuringiensis* Cry1Ac Toxin on *Trichoplusia ni* Membranes. *FEBS Letters* 414: 303-307.
9. A Lorence, J Sánchez, A Darszon, and A Bravo (1996) Pore Formation of the *Bacillus thuringiensis* Cry1Ac Toxin in Presence of the *Trichoplusia ni* Toxin-Receptor in Planar Lipid Bilayers". *Medical Microbiology and Immunology* 185: 114.
10. A Lorence, A Darszon, C Díaz, A Liévano, R Quintero, and A Bravo (1995) δ -Endotoxins Induce Cation Channels in *Spodoptera frugiperda* Brush Border Membrane in Suspension and in Planar Lipid Bilayers". *FEBS Letters* 360: 217-222.
11. Bravo A, A Lorence, and R Quintero (1995) Biopesticides Compatible with the Environment: *Bacillus thuringiensis* a Unique Model. *Biocontrol* 1: 41-55.

Manuscripts in preparation

1. A Lorence, J Martínez-Quintana, G Trujillo*, M Reidy, A Rogers*, P Mendes, BI Chevone, C Cramer, and CL Nessler (2007) Identification and characterization of a glucuronic acid reductase in *Arabidopsis thaliana*". In preparation to *Plant Physiology*.
2. A Lorence, M Reidy and CL Cramer (2007) Current Approaches to Gene Transfer and Expression in Plants. In preparation to *Molecular Biotechnology*.
3. L Nopo-Olazabal, S Simeon*, R Hannigan, A Lorence, and F Medina-Bolivar (2007) Elicitation and secretion of sesquiterpenes in hairy roots cultured in the Liquid LabTM bioreactor. In preparation to *Acta Horticulturae*.
4. R Pereda-Miranda, R Villatoro-Vera*, M Bah, and A Lorence (2007) Cell membrane disruption by morning glory resin glycosides. In preparation to *Phytochemistry*.
5. KA Lisko*, J Martínez-Quintana, B Jullian*, MM Vaughan*, BI Chevone, CL Nessler and A Lorence (2007) Metabolic engineering for increased ascorbic acid also increases stress-tolerance in Arabidopsis. In preparation to *Plant Biotechnology*.
6. A Lorence, BJ Woffenden, J Martínez-Quintana, L Nopo-Olazabal, CL Nessler, and F Medina-Bolivar (2007) Enhanced production of specialized metabolites in tobacco over-expressing an AP2-type transcription factor. In preparation to *Plant Molecular Biology*.

7. W Zhang, A Lorence, CL Nessler, and BI Chevone (2007) A novel F-box gene, *VCF1*, is involved in negative regulation of the mannose/galactose pathway for ascorbate biosynthesis in *Arabidopsis*. In preparation to *Plant Journal*.
8. A Lorence, J Robinson*, BI Chevone, P Mendes, and CL Nessler (2007) Contribution of the myo-inositol oxygenase (*miox*) gene family of *Arabidopsis thaliana* to ascorbate biosynthesis. In preparation to *Plant Molecular Biology*.

Books

1. Co-editor of the book: "Recombinant Gene Expression. Reviews and Protocols" (2004) P Balbás and A Lorence (eds). Molecular Biology Series. Humana Press, Totowa, 535 pp. ISBN 1-58829-262-2. Included in the list of the 2004-2005 best sellers of Humana Press.

Special issues of scientific journals

- 1 Co-editor of a special issue on hairy roots of the Electronic Journal of Integrative Biology (<http://clt.astate.edu/electronicjournal/>). F Medina-Bolivar and A Lorence (co-editors). March 2007 – February 2008.

Book chapters

1. A Lorence and CL Nessler (2007) Pathway engineering of the plant vitamin C metabolic network. In "Applications of Plant Metabolic Engineering" R Verpoorte, AW Alfermann and TS Johnson (eds). Springer, chapter 8, 189-209.
2. E Aranda, A Lorence, and MR Trejo (2000) Rural Production of *Bacillus thuringiensis* by Solid State Fermentation. In "Entomopathogenic Bacteria: From Laboratory to Field Application". JF Charles, A Delecluse, and C Neilsen-Le Roux (eds). Kluwer Academic Publishers, Dordrecht, p. 317-332. ISBN 0-7923-6523-2.
3. A Lorence and R Quintero (2000) In Search of Novel and Better Bioinsecticides. In "Environmental Biotechnology and Cleaner Bioprocesses". EJ Olguín, G Sánchez, and E Hernández (eds). Taylor & Francis, London, p. 275-284. ISBN 0-7484-0729-4.
4. R Quintero, A Lorence, and C Wachter (1999) Cereal Fermentation in Latin American Countries. In "Fermented Cereals- A Global Perspective". Food and Agriculture Organization of the United Nations (FAO). Agricultural Services Bulletin 138, Rome, p. 99-114. ISBN 92-5-104296-9.
5. A Lorence and R Quintero (1997) Development of New Bioinsecticides. In "International Course: Biochemical Engineering Applications in Environmental Biotechnology and Cleaner Production". COBIOTECH Scientific Committee for Biotechnology of the International Council of Scientific Unions ICSU. Electronic course, available at: <http://www.icaiti.org.gt>.
6. Bravo A, J Cerón, E Aranda, A Lorence, and R Quintero (1995) Screening of *Bacillus thuringiensis* Strains With Novel Insecticidal Activities. In "*Bacillus thuringiensis* Biotechnology and Environmental Benefits". T-Y Feng *et al.* (eds). Hiang Yuan Publishing, Taipei, p. 87-103.

Intellectual property

1. International Patent Application, PCT/US03/27779 and US Patent Application No 10/538,885 "Manipulation of Ascorbic Acid Level in Plants" CL Nessler, A Lorence, P Mendes, and BI Chevone.
2. US Patent Office Application, June 23, 2005 "Increase in Plant Growth Rate, Biomass Accumulation, and Stress Tolerance in Plants Over-expressing Genes in the Ascorbic Acid-Cell Wall Biosynthetic Network" CL Nessler, A Lorence, P Mendes, and BI Chevone.

Technical Reports

Report 2006-2007 "Role of Ascorbate in Coordinating Growth and Senescence in *Arabidopsis thaliana*"

Agency: Arkansas IDeA Network of Biomedical Research Excellence (Arkansas INBRE), National Institute of Health (NIH)
February 5th, 2007.

Outreach

1. A Lorence (2005) "Metabolic Engineering for the Improvement of the Nutritional and Agronomical Value of Crops" Annual Report of the Arkansas State University Foundation.

Scientific publications (Spanish)

Journal articles

1. A Lorence, RL González and JL Solleiro (1993) Basic Elements for the Development and Spreading of Biotechnology, A Comparative Analysis (*Los Elementos Básicos para el Desarrollo y Difusión de la Biotecnología: Un Análisis Comparativo*). *Biotecnología* 3: 1-7.
2. A Bravo, A Lorence and R Quintero (1992) Perspectives for the Use of *Bacillus thuringiensis* as Bioinsecticide (*Perspectivas en la Utilización de Bacillus thuringiensis como Bioinsecticida*). *Biotecnología* 2: 139-154.

Technical Reports

1. A Lorence (1999) Agrobiologicals (*Agrobiológicos*). *Cuadernos de Vigilancia Tecnológica*. JL Solleiro and R Castañón (eds). *Iniciativa Canadá-América Latina de Biotecnología para el Desarrollo Sustentable (CAMBIOTEC)*. International Development Research Center (IDRC) and Núcleo de Innovación Tecnológica del Instituto de Ingeniería/UNAM, Mexico City, 58 p.
2. A Lorence (1996) Biopesticides in the Context of Sustainable Agriculture (*Los Biopesticidas en el Marco de la Agricultura Sustentable*). *Cuadernos de Vigilancia Tecnológica*. JL Solleiro and R Castañón (eds). *Iniciativa Canadá-América Latina de Biotecnología para el Desarrollo Sustentable (CAMBIOTEC)*, International Development Research Center (IDRC) and Centro Para la Innovación Tecnológica/UNAM, Mexico City, 72 p.

Book chapters

1. P Balbás and A Lorence (2002) Corn Genetically Improved: Implications for the Agriculture in the State of Morelos (*Maíz Genéticamente Mejorado: Implicaciones para la Agricultura en el Estado de Morelos*). In "Land, Water and Corn II, Reality and Utopy" (*Tierra, Agua y Maíz II. Realidad y Utopía*). UNICEDES/UAEM, Cuernavaca, p. 167-182. ISBN 968-878-136-3.
2. P Balbás, C Abarca, AD Caro* and A Lorence (2000) Applications of Molecular Genetics in Medicine (*Aplicaciones de la Genética Molecular en la Medicina*). In "Biological Sciences: From Life Origin to Genetic Therapy" (*Ciencias Biológicas. Del Origen de la Vida a la Terapia Génica*). E Sánchez-Salinas and ML Ortiz-Hernández (eds). Universidad Autónoma del Estado de Morelos, Cuernavaca, p. 223-255. ISBN 968-878-055-3.
3. P Balbás and A Lorence (2000) Protein Biosynthesis by Recombinant DNA (*La Biosíntesis de Proteínas por DNA Recombinante*). In "Biological Sciences: From Life Origin to Genetic Therapy" (*Ciencias Biológicas, Del Origen de la Vida a la Terapia Génica*). E Sánchez-Salinas and ML Ortiz-Hernández (eds). Universidad Autónoma del Estado de Morelos, Cuernavaca, p. 182-222. ISBN 968-878-055-3.
4. A Lorence and P Balbás (1998) Molecular Biology, A General Overview (*La Biología Molecular: Una Visión General*). In "Biology. Molecular Bases at the Threshold of the XXI Century" (*Biología. Sus Bases Moleculares en el Umbral del Siglo XXI*). E Sánchez-Salinas and ML Ortiz-Hernández (eds). Universidad Autónoma del Estado de Morelos, Cuernavaca, p. 40-125. ISBN 968-878-038-3.
5. A Lorence (1997) Relevance and Potential of Biotechnology for Potato Crop (*Importancia y Potencial de la Biotecnología para el Cultivo de Papa*). In "Potato and Chilli Pepper" (*Papa y Chile*). *Cuadernos de Vigilancia Tecnológica*. JL Solleiro and R Castañón (eds). *Iniciativa Canadá-América Latina de Biotecnología para el Desarrollo Sustentable (CAMBIOTEC)*, International Development Research Center (IDRC) and Centro para la Innovación Tecnológica/ UNAM. Mexico City, p. 11-78
6. A Bravo, M Ortiz, A Ortiz, J Cerón, E Aranda, J Sánchez, R Meza, ME Nuñez and A Lorence (1996) Search and Construction of New Insecticidal Proteins from *Bacillus thuringiensis* (*Búsqueda y Construcción de Nuevas Proteínas Insecticidas de Bacillus thuringiensis*). In "Frontiers in Biotechnology and Bioengineering" (*Fronteras en Biotecnología y Bioingeniería*). E Galindo (ed). Sociedad Mexicana de Biotecnología y Bioingeniería, Mexico City, p. 375-379. ISBN 968-7735-00-7.

7. A Lorence and R Quintero (1996) Molecular Mechanism of Action of *Bacillus thuringiensis* δ -Endotoxins (Mecanismo Molecular de Acción de las δ -Endotoxinas de *Bacillus thuringiensis*). In "Recent Progress in Biotechnology of *Bacillus thuringiensis*" ("*Avances Recientes en la Biotecnología de Bacillus thuringiensis*"). Luis J Galán-Wong, C Rodríguez-Padilla and HA Luna-Olvera (eds). *Universidad Autónoma de Nuevo León (UANL)*, Monterrey, p. 63-113. ISBN 968-6337-98-9.
8. A Lorence (1992) Potential of Biotechnology for Tomato Production (*Potencialidades de la Biotecnología Para la Producción de Tomate*). In "Biotechnology and Its Socioeconomical and Political Consequences" ("*La Biotecnología y sus Repercusiones Socioeconómicas y Políticas*"). R Casas, M Chauvet and D Rodríguez (coords). *Departamento de Sociología/UAM-A, Instituto de Investigaciones Económicas/UNAM, Instituto de Investigaciones Sociales/UNAM*. Mexico City, p. 301-317. ISBN 968-36-2703-X.

Presentations at professional meetings and invited lectures (*student authors)

Lectures

1. Invited lecture for Scholars of the NSF-funded Research Internships in Science of the Environment (RISE), Arkansas State University, Jonesboro, AR. Topic: "The Importance of Networking". July 24, 2007.
2. Seminar, April 13, 2007, Plant Biotechnology Discussion Group, Arkansas Biosciences Institute, Jonesboro, AR. "An update in the science of vitamin C" G Trujillo, G Wilson, K Lisko, S Harris, S Simeon, J Yactayo and A Lorence.
3. Invited lecture, February 12, 2007. University of Arkansas at Little Rock, Biosciences and Bioinformatics Spring Seminar Series, Little Rock, AR. "Engineering vitamin C levels in plants: new roles for an old molecule". A Lorence.
4. Invited lecture, Dec 20, 2006. Symposium on Biological, Chemical Defense and Homeland Security, 2006 International Conference on Bio and Pharmaceutical Science and Technology (ICBPST), San Diego, CA, Dec 18-21, 2006. "Harnessing the potential of plant genomics in detection and remediation of explosives and chemical weapons" RS Harris*, T Moss*, R Hannigan, and A Lorence.
5. Seminar, October 20th, 2006, Plant Biotechnology Discussion Group, Arkansas Biosciences Institute, Jonesboro, AR. "The role of ascorbate in coordinating growth and senescence in *Arabidopsis thaliana*: an update" A Lorence.
6. Invited seminar, October 5th, 2006, POI Aging Work Group at UAMS, Little Rock, AR. "The role of ascorbate in coordinating growth and senescence in *Arabidopsis thaliana*: an update" A Lorence.
7. Invited lecture for Scholars of the NSF-funded Research Internships in Science of the Environment (RISE), Arkansas State University, Jonesboro, AR. Topic: "The Importance of Networking". July 20, 2006.
8. Invited lecture, July 11, 2006. Phytochemical Society of North America Meeting, July 8-12, 2006, Oxford, MS. "Enhanced production of specialized metabolites in tobacco over-expressing an AP2-type transcription factor". A Lorence, BJ Woffenden, J Martínez-Quintana*, L Nopo-Olazabal, CL Nessler, and F Medina-Bolivar.
9. Seminar, July 7, 2006, Plant Biotechnology Discussion Group, Arkansas Biosciences Institute, Jonesboro, AR. "What is an ORCA doing in my tobacco?" A Lorence.
10. Invited seminar, June 1st, 2006, POI Aging Work Group at UAMS, Little Rock, AR. "Role of ascorbate in coordinating growth and senescence in *Arabidopsis thaliana*" A Lorence.
11. Seminar, May 26, 2006, Plant Biotechnology Discussion Group, Arkansas Biosciences Institute, Jonesboro, AR. "Synopsis of Symposium: RNA Biology – Novel Insights from Plants" A Lorence.
12. Invited seminar, October 14, 2005 American Chemical Society Student Meeting, Arkansas State University, Jonesboro, Arkansas "Vitamin C, a master nutrient for humans and a crossroad in plant biochemistry" A Lorence.
13. Invited seminar, September 30, 2005 Department of Chemistry, University of Memphis, Memphis, TN "Vitamin C biosynthesis in plants, a tale of many routes" A Lorence.

14. 2005 Meeting of the Phytochemical Society of North America "Integrative Plant Biochemistry as We Approach 2010" July 30 – August 3, 2005, Salk Institute, CA "Over-expression of transcription factors to manipulate specialized metabolite biosynthesis" A Lorence, BJ Woffenden, M Smith, CL Nessler, and F Medina-Bolivar.
15. 2005 *In Vitro* Biology Meeting, June 5-7, 2005, Baltimore, MD "The vitamin C network – new branches in plant biochemistry" CL Nessler, A Lorence, BI Chevone and P Mendes.
16. Invited talk, 2nd National Meeting of Chemistry of Natural Products, "Dr. Alfonso Romo de Vivar Romo", May 25-28, 2005, Cocoyoc, México "Manipulation of the metabolic network of vitamin C for the production of plants with enhanced properties" A Lorence, BI Chevone, P Mendes and CL Nessler.
17. Invited Seminar, May 16th, 2005. Clemson University, Clemson, SC. "Manipulating the vitamin C metabolic network for the nutritional and agronomical enhancement of plants" A Lorence.
18. Invited Seminar, April 21st, 2005. Arkansas Biosciences Institute (ABI), Arkansas State University (ASU), Jonesboro, AR. "Manipulating the vitamin C metabolic network for the nutritional and agronomical enhancement of plants" A Lorence.
19. Invited Seminar, April 14th, 2005 University of Texas – San Antonio (UTSA), San Antonio, TX "Manipulating the vitamin C metabolic network for the nutritional and agronomical enhancement of plants" A Lorence.
20. Invited Seminar, March 4th, 2005. Polytechnic University, Brooklyn, NY "Manipulating the vitamin C metabolic network for the nutritional and agronomical enhancement of plants" A Lorence.
21. Arthur Neish Young Investigator Symposium Speaker, 2002 Annual Meeting, Phytochemical Society of North America (PSNA). July 20-24, 2002, Mérida, México "Holes in the membranes: how allelochemicals in the morning glory family dispose of enemies?" A Lorence, R Villatoro-Vera*, and R Pereda-Miranda.
22. Invited seminar, Molecular Biology Seminar Series, CINVESTAV- Irapuato, México, March 20, 2002 "The relationship between ORCAs and the joy tree" A Lorence.
23. Invited seminar, *CEIB, UAEM*, Cuernavaca, México, December 13, 2001. "Metabolic engineering of medicinal plants" A Lorence.
24. Invited seminar, 1st Engineering Congress, *Universidad Iberoamericana*, Mexico City, México, September 20, 2001. "Applications of molecular biology and biotechnology" A Lorence.
25. Invited seminar, Morelos Delegation of the Mexican Society of Biotechnology and Bioengineering, Cuernavaca, México, October 22, 1999. "Introduction of insect-resistant corn in Mexico". A Lorence and R. Quintero.
26. Invited seminar, *Centro de Investigación Biomédica del Sur/IMSS*, Xochitepec, México, October 21, 1999. "Evaluation of the socio-economical impact of the introduction of *Bt* corn to Mexico" A Lorence and R Quintero.
27. Invited seminar, Molecular Biology Seminar Series, CINVESTAV- Irapuato, México. July 9, 1999. "The mechanism of action of *Bacillus thuringiensis* Cry proteins: implications for the management of *Bt* corn in Mexico" A Lorence and R Quintero.
28. Invited seminar, International Symposium "Modern strategies for contamination control and development of clean technologies", *Instituto de Ecología*, Boca del Río, México, March 11-13, 1996. "In search of novel and better bioinsecticides" A Lorence and R Quintero.
29. Invited seminar, 5th Week of Scientific Research, CONACYT and UAEM, Cuautla, México, April 1994. "Alternatives to chemical pest control". A Lorence and R Quintero.
30. Invited seminar, V Congress of Biotechnology and Bioengineering, Puerto Vallarta, México, September 1993. "Basic elements for the development and diffusion of biotechnology in Mexico, a comparative analysis" A Lorence, RL Gonzalez, and JL Solleiro.
31. Invited seminar, *Instituto de Investigaciones Económicas (UNAM)*, *Instituto de Investigaciones Sociales (UNAM)* and *Departamento de Sociología (UAM-A)*, Mexico City, México, November 25-27, 1991. "Feasibility study of the production and commercialization of insect-resistant tomato seeds" A Lorence, and H Rojas.

Posters

1. 17th Annual World Symposium, International Food and Agribusiness Management Association, June 23-26, Parma, Italy. "Fruits and vegetable consumption among college students in Arkansas and

- Florida: food culture versus health knowledge” C Schroeter, L Offenbach and A Lorence. Nominated to *Best Paper Award* in Agribusiness Symposium.
2. Arkansas Bioinformatics Society (ARBIOS) Symposium: Building Careers in Bioinformatics, Arkansas State University, Jonesboro, AR, April 19-21, 2007. “Glucuronolactonase, a gene family encoding enzymes involved in vitamin C biosynthesis and degradation” G Wilson*, J Martínez-Quintana, and A Lorence. *Gwendolyn Wilson received the award for the best undergraduate poster of the symposium.*
 3. 21st National Conference on Undergraduate Research, April 12-14, Dominican University of California, San Rafael, CA. “Vitamin C biosynthesis in mustard species”. J Uwase*, G Wilson*, J Martínez-Quintana, S Simeon*, S Hill, S Vanderpool, and A Lorence.
 4. Pittsburgh Conference (Pittcon 2007) Meeting, February 25 – March 1, 2007, Chicago, IL “HPTLC method for simultaneous cellular redox and energy state determination of plant samples” S Simeon*, R Hannigan, J Martínez-Quintana, F Medina-Bolivar, and A Lorence.
 5. Fall 2006 INBRE – Undergraduate Research Conference, University of Arkansas, November 3-4, 2006, Fayetteville, AR. “Screening of *Arabidopsis thaliana* knockout lines looking for genes encoding glucuronolactonase, the third enzyme in the *myo*-inositol pathway to ascorbate” G Wilson*, J Uwase*, S Simeon*, J Martínez-Quintana, and A Lorence.
 6. Fall 2006 INBRE – Undergraduate Research Conference, University of Arkansas, November 3-4, 2006, Fayetteville, AR. “Elevated foliar vitamin C content confers plants tolerance to stresses” KA Lisko*, J Martínez-Quintana, B Jullian*, M Vaughan*, BI Chevone, CL Nessler, and A Lorence.
 7. ABI 2006 Fall Symposium, October 25, 2006, Little Rock, AR. “ORNA: a master regulator of genes in the tobacco plant” A Lorence, BJ Woffenden, J Martinez-Quintana, L Nopo-Olazabal, CL Nessler and F Medina-Bolivar.
 8. ABI 2006 Fall Symposium, October 25, 2006, Little Rock, AR. “Vitamin C biosynthesis in mustard species” J Uwase*, G Wilson*, J Martínez-Quintana, S Simeon*, S Hill, S Vanderpool, and A Lorence.
 9. ABI 2006 Fall Symposium, October 25, 2006, Little Rock, AR. Seeding success...from people to products” C Cramer, E Hood, M Dolan, and A Lorence.
 10. Society for Advancement of Chicanos and Native Americans in Science Meeting, October 26-28, 2006, Tampa, FL “Screening of *Arabidopsis thaliana* knockout lines looking for genes encoding glucuronolactonase, the third enzyme in the *myo*-inositol pathway to ascorbate” G Wilson*, J Uwase*, S Simeon*, J Martínez-Quintana*, and A Lorence.
 11. Society for Advancement of Chicanos and Native Americans in Science Meeting, October 26-28, 2006, Tampa, FL “Elevated foliar vitamin C content confers plants tolerance to stresses” KA Lisko*, J Martínez-Quintana*, B Jullian*, M Vaughan*, BI Chevone, CL Nessler, and A Lorence.
 12. International Symposium on High Performance Thin Layer Chromatography, October 9-11, 2006, Berlin, Germany “HPTLC as a tool to rapidly assess the elicitor responsiveness of hairy roots cultured in the Liquid LabTM reactor” F Medina-Bolivar, L Nopo-Olazabal, S Simeon*, K Shelton, J Condori, R Hannigan, and A Lorence.
 13. RISE Scholars 2006 Summer Research Symposium, August 11, 2006, Jonesboro, AR. “Vitamin C biosynthesis in mustard species” J Uwase*, G Wilson*, J Martínez-Quintana*, S Simeon*, S Hill*, S Vanderpool, and A Lorence.
 14. McNair Scholars 2006 Summer Research Symposium, July 26-27, 2006, Jonesboro, AR “Screening of *Arabidopsis* lines looking for genes encoding glucuronolactonase, the third enzyme in the *myo*-inositol pathway to ascorbate” G Wilson*, J Uwase*, S Simeon*, J Martínez-Quintana*, and A Lorence.
 15. Phytochemical Society of North America Meeting, July 8-12, 2006, Oxford, MS “Elicitation and secretion of sesquiterpenes in hairy roots cultured in the Liquid LabTM bioreactor”. L Nopo-Olazabal, S Simeon*, R Hannigan, A Lorence, and F Medina-Bolivar. *Scott Simeon received a Travel Award from the PSNA.*
 16. 16th Penn State Symposium in Plant Physiology, May 18-20, 2006, State College, PA “*Myo*-Inositol oxygenase and D-glucuronic acid reductase, the two first enzymes in a new route to vitamin C formation in plants” A Lorence, A Rogers*, J Martínez-Quintana*, J Robinson, W Zhang, P Mendes, BI Chevone, and CL Nessler.
 17. 2005 Fall Symposium, Arkansas Biosciences Institute, September 28-29, 2005, Little Rock, AR. “*Myo*-inositol oxygenase and glucuronic acid reductase, the two first enzymes in a new route to

- vitamin C formation in plants" [A Lorence](#), A Roger*, J Robinson*, W Zhang, P Mendes, B Chevone, and CL Nessler.
18. 1st Gordon Conference in Plant Metabolic Engineering, July 10-15, Tilton, NH "A novel F-box gene, *osf1*, regulates leaf ascorbate in Arabidopsis and alters ozone sensitivity" W Zhang, [A Lorence](#), CL Nessler, and BI Chevone.
 19. 37th Air Pollution Workshop, April 25-28, Banff, Alberta, Canada "A novel F-box gene, *osf1*, regulates leaf ascorbate in Arabidopsis and alters ozone sensitivity" W Zhang, [A Lorence](#), CL Nessler, and BI Chevone.
 20. 21st Annual Research Symposium and Exposition of the Graduate Student Assembly of Virginia Tech, March 23, 2005. Blacksburg, VA "Metabolic engineering of specialized metabolite biosynthesis, a novel approach for the discovery of human therapeutics" M Smith, B Woffenden, CL Nessler, [A Lorence](#), and F Medina-Bolivar.
 21. 15th International Conference on Arabidopsis Research. July 11-14 2004, Berlin, Germany "Contribution of the *myo*-inositol oxygenase (*miox*) gene family of *Arabidopsis thaliana* to ascorbate biosynthesis" [A Lorence](#), J Robinson*, BI Chevone, P Mendes, and CL Nessler.
 22. 15th International Conference on Arabidopsis Research. July 11-14 2004, Berlin, Germany "Identification and characterization of a putative glucuronic acid reductase in *Arabidopsis thaliana*" [A Lorence](#), A Rogers*, P Mendes, W Zhang, BI Chevone, and CL Nessler.
 23. 2004 International Congress on Natural Products Research. July 31-August 4 2004, Phoenix, AZ "Convolvulaceous resin glycosides induce non-selective pore formation in cell membranes" RA Villatoro-Vera*, M. Bah, [A Lorence](#), and R Pereda-Miranda.
 24. 2003 Symposium, Undergraduate Summer Research Internship of the Multicultural Academic Opportunities Program. Summer, 2003, Blacksburg, VA "Genetic engineering of an alternative vitamin C pathway in Arabidopsis" J Robinson*, [A Lorence](#), BI Chevone, P Mendes, and CL Nessler.
 25. First International Congress on Plant Metabolomics, April 7-11 2002, Wageningen, The Netherlands "Production of camptothecin and 10-hydroxycamptothecin from *Camptotheca acuminata* hairy roots" [A Lorence](#), F Medina-Bolivar, and CL Nessler.
 26. 42nd Annual Meeting of the *American Society of Pharmacognosy* "Exploring Natural Products from Latin American Biodiversity", July 14-18 2001, Oaxaca, México "Camptothecine production by *Camptotheca acuminata* cell suspensions" JS Angeles*, ML Villarreal, R Quintero, R Pereda-Miranda, and [A Lorence](#).
 27. First Congress of Principal Investigators of Research Projects in Applied Biological Sciences, CONACYT, Acapulco, México "Transformation of *Camptotheca acuminata* cell cultures for the production of camptothecin, a terpene with anticancer and antiretroviral activities" [A Lorence](#), JS Angeles*, ML Villarreal, CL Nessler, and R Quintero.
 28. Perspectives and Limitation of Biotechnology in Developing Countries, January, 24-28, 2000, San José, Costa Rica. "Camptothecine production by *Camptotheca acuminata* cell line cultures, a case of study of economic feasibility". JS Angeles*, R Quintero, and [A Lorence](#).
 29. X Week of Scientific Research, UAM-X, September 27 – October 1st, 1999, Mexico City, México "Technological innovation in Mexican agriculture and agroindustry" JL Solleiro, C Del Valle, I Nuñez, H Hernández, R López, R Calderón, [A Lorence](#), R Castañón, and G Pérez-Jerónimo.
 30. 30th Annual Meeting SIP Banff 97, Society for Invertebrate Pathology, August 24-29 1997, Banff, Alberta, Canada "Phylogenetic and functional analysis of the *Bacillus thuringiensis* insecticidal crystal protein family" A Bravo, [A Lorence](#), J Sánchez, H Flores, L Güereca, and ME Nuñez.
 31. 12th World Congress on Animal, Plant and Microbial Toxins, International Society on Toxinology. September 21-26, 1997, Cuernavaca, México. "Is aminopeptidase N the receptor of Cry1Ac α -endotoxin in *Trichoplusia ni* midgut?" [A Lorence](#), A Darszon, and A Bravo.
 32. 12th World Congress on Animal, Plant and Microbial Toxins, International Society on Toxinology. September 21-26, 1997, Cuernavaca, México "The insecticidal crystal protein family from *Bacillus thuringiensis*" A Bravo, [A Lorence](#), J Sánchez, H Flores, L Güereca, and ME Nuñez.
 33. XXI National Congress of Biochemistry, November 3-7, 1996, Manzanillo, México "Ionic channels formed by the Cry1Ac toxin in presence of its receptor in black lipid bilayers" [A Lorence](#), J Sánchez, A Darszon, and A Bravo.
 34. XX International Congress of Entomology. August 25-31, 1996, Florence, Italy "Functional and phylogenetic studies of the pore formation domain from the *Bacillus thuringiensis* delta-endotoxins" A Bravo, [A Lorence](#), J Sánchez, and ME Nuñez.

35. Third International Workshop on Pore-Forming Toxins, September 26-28, 1996, Mainz, Germany "Pore formation of the *Bacillus thuringiensis* Cry1Ac toxin in presence of the *Trichoplusia ni* toxin-receptor in planar lipid bilayers" A Lorence, J Sánchez, A Darszon, and A Bravo.
36. XX National Congress of Biochemistry, SMB, October 30, November 4, 1994, Zacatecas, México "Permeability changes on *Spodoptera frugiperda* BBMV caused by *Bacillus thuringiensis* δ -endotoxins" A Lorence, A Darszon, R Quintero, and A Bravo.
37. International Cooperation for Development of Biotechnology Conference organized by the National Steering Committee for Biotechnology, the Chief Scientist Ministry of Industry and Trade, the Ministry of Science and the Arts, the Israel Center for R&D (MATIMOP), the Israel Export Institute and the Rashi Foundation, October 30 – November 3, 1994, Jerusalem, Israel "Cry toxins induce an increase in cation membrane permeability involving ion channels in BBMV containing functional receptors" C Díaz, A Lorence, A Darszon, A Liévano, R Quintero, and A Bravo.
38. Second Meeting of the Mexican Society of Cell Biology, October 5-7, 1994, Mexico City, Mexico "Effects of *Bacillus thuringiensis* δ -endotoxins on the permeability of *Spodoptera frugiperda* brush border membrane vesicles" A Lorence, A Darszon, R Quintero, and A Bravo.
39. VIth International Colloquium on Invertebrate Pathology and Microbial Control y IIth International Conference on *Bacillus thuringiensis*, Society for Invertebrate Pathology (XXVIIth Annual Meeting). August 28 – September 2, 1994, Montpellier, France "Effects of *Bacillus thuringiensis* δ -endotoxins on the permeability of *Spodoptera frugiperda* midgut brush border membrane vesicles" A Lorence, A Darszon, R Quintero, and A Bravo.
40. Academic Meeting, X Anniversary of the Graduate Program in Biotechnology, CCH/UNAM, June 2-3, 1994, Mexico City, México "Design of a detection system of new *Bacillus thuringiensis* δ -endotoxins" A Lorence, A Darszon, R Quintero, and A Bravo.
41. Second Workshop on Pore-Forming Toxins. September 29 - October 2, 1993, Mainz, Germany. "Fluorometric assay of potential changes of *Spodoptera frugiperda* midgut brush border membrane shows that δ -endotoxin from *Bacillus thuringiensis* induces cation selective pore formation" A Lorence, A Darszon, R Quintero and A Bravo.
42. First Meeting of the Mexican Society of Cell Biology, June 14-16, 1993, Mexico City, México "Design of a detection system for new *Bacillus thuringiensis* δ -endotoxins based on changes in ion transport of brush border membrane vesicles" A Lorence, R Quintero, A Darszon and A Bravo.
43. The Ninth International Biotechnology Symposium, *American Chemical Society*. August 16 – 21, 1992, Crystal City, VA "Biotechnology for the development of Mexico" JL Solleiro, RL González, A Lorence, and G Gómez.
44. IV National Congress of Biotechnology and Bioengineering, SMBB, September 8-12, 1991, Mexico City, México "Comparative kinetic study of *Candida utilis* and *Saccharomyces cerevisiae* cultures in different carbon sources" A López-Baca, M Trejo-Loyo, A Lorence, and J Gómez.
45. II Week of Experimental Biology, *Universidad Autónoma Metropolitana*, Iztapalapa, May 6-9, 1991, Mexico City, México "Effect of the carbon source concentration in the biochemistry and physiology of *Saccharomyces cerevisiae* biomass production" A Lorence, A Medina, M More, T Roldán, and J Gómez.

Attention of the media to my research

Papers describing my research

1. "A-State teaching students how to investigate crime scenes" by Sherry F. Pruitt. Lead story (front page) of *The Jonesboro Sun*, July 1st, 2006.
2. My research program was chosen by Dr. Elizabeth Hood, Associate Vice Chancellor for Research and Technology Transfer to represent ASU in the American Association of State Colleges and Universities, July 2006.
3. "Biosciences Center researchers optimistic about work in plants" by Sherry F. Pruitt. Lead story of *The Jonesboro Sun*, March 12, 2006.
4. "Biosciences director describes research" by Grover Welch. *The Jonesboro Sun*, January 19, 2006.
5. Interview for "*The Herald*", ASU Newspaper, September 15th 2005, Jonesboro, AR.
6. "The Arkansas Biosciences Institute" by Tom Moore. *Arkansas Agriculture*, 2005, Vol. 3, Issue 1, p. 15-18.

7. Book I co-edited: "Recombinant Gene Expression. Reviews and Protocols" featured at *Virginia Tech Magazine*, 2004, Vol. 27, No. 1 (section books by alumni, faculty and staff).

TV appearances

1. The "CSI Summer Camp 2006" was the lead story on Monday June 26, 2006 of KAIT TV 8, local TV station, Jonesboro, AR.
2. Participant of the televised panel discussion entitled: "Clash of the Minorities". Event organized as part of the Hispanic Heritage Week Celebration, Arkansas State University, TV Studio at the College of Communications Building. September 14th 2005, Jonesboro, AR.
3. TV and radio interview: "Biotechnology in Mexico". TV and Radio Show entitled: "*Detrás de la Noticia con Ricardo Rocha*", *Grupo IMER* Radio 660 AM and 94.5 FM and Cable TV. Guesses: Drs. Argelia Lorence and Enrique Galindo. November 10, 2001, Mexico City, México.

Radio interviews

"Vitamin C and aging", Interview aired on November 6, 2006 at KASU.

Papers published in newspapers

1. "ASU team seeks keys to aging process" by Argelia Lorence, *The Jonesboro Sun*, April 30, 2006.
2. "The Monarch Butterfly and Genetically Modified Corn" by Paulina Balbás and Argelia Lorence, *La Jornada- Investigación y Desarrollo*, December, 2001.

Advisory activities

Current (Primary Advisor)

Lab technicians

Jessica Yactayo	-Chang	March 2007 to present
Shannon Hill (part time)		September 2005 to December 06
Javier Martínez-Quintana		January 2006 to February 2007

Graduate student

Guillermo Trujillo	PhD-Molecular Biosciences	October 2006 to present
Scott Simeon	MS-Chemistry	January 2006 to present
Rodney Shea Harris	MS-Environmental Sciences	January 2007 to present

Undergraduate students

Katherine Lisko	BS-Forensic Science	October 2005 to present
Gwendolyn Wilson	BS-Biology	August 2006 to present
Hillary Colvard	BS-Chemistry	January - February 2007
Rodney Shea Harris	BS-Biology	July - December 2006

Summer interns

Gwendolyn Wilson	McNair Scholar	ASU-Biology	Summers 2006 and 2007
Jeannette Uwase	RISE Scholar	Ivy Tech CC	Summer 2006
Melinda Belisle	WPI-Scholar	WPI	March 07 to present
Fayeann Crawford	RISE Scholar	ND	Summer 2007

High school student

Jonathan Radin Jonesboro High School Summer 2006 to present

Current (Co-advisor)

Visiting scholar (in collaboration with Dr. Gregory Phillips)

Audrei Nisio	State University of Ponta Grossa (Brazil)	BS-Agronomy Engineering	July 06-present
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Federica Bestoso	University of Genoa (Italy)	PhD	July-Aug 07
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Current (Committee Member)

PhD student

Janet María León M	CEIB/UAEM	PhD-Biotechnology	June 2006 – present
Alejandra Ratti	ASU	PhD-Molecular Biosciences	February 2007 - present

As an Assistant Professor (México)

1999-2003 Primary Advisor

<i>Student</i>	<i>Major</i>	<i>Degree</i>	<i>Year granted</i>
Ana Lilia Mercado-Sánchez	Chemical Engineering	BS	2002
Alejandra Rueda-Deagüeros	Chemistry	BS	2003

1998-2003 Committee Member

<i>Student</i>	<i>Degree</i>	<i>Period</i>	<i>Year granted</i>
Nubia C Moreno-Sarmiento	MS	1998-1999	March 1999
Rubí Hernández-Rubio	MS	1998-1999	Sep 1999
Alfredo Regalado-Páramo	MS	1998-2001	Aug 2001
Víctor H Chávez-Tovar	MS	2001-2003	July 2003
María Alejandra Brito-Cruz	MS	2000-2002	Dec 2003
Ricardo Villatoro-Vera	PhD	1999-2002	N.D.
Lucila Valdéz-Castro	PhD	1999-2003	June 2003

As a Post-doctoral Research Associate

April 02 – July 05

Supervisor of lab technicians, graduate students, undergraduate students and summer interns in Craig Nessler laboratory at Virginia Tech

Lab technicians

Martha Vaughan	March to August 2005
Amy Vance	November 2002 to February 2005
Karen Stump	April to July 2002

Graduate students

Jessica Radzio	MS	2002-2003
Michelle Raymond	MS	2002-2004

Visiting scholars

Berangère Jullian	BS-Bioinformatics Universite D'Auvergne (France)	April - August 2005
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Undergraduate students

Catherine O'Mara	March 2004 to August 2005
James A Gardner	August 2004 to August 2005
Joseph D Wood	January - August 2005
Jennifer A Witten	March - August 2005
Thomas R Evans	April - August 2005
Amber M Rogers	September 2002 to May 2005
Martha Vaughan	September 2003 to February 2005
Melanie Turner	May 2002 to January 2005
Katherine Mitchell	May 2002 to July 2004
Jefferson Stroud	May 2003 to February 2004

Courtney Rudd	April 2002 to April 2003
Kristos Vaughan	February - December 2004
David Harbourt	February - August 2004
Jessica Caldwell	September - December 2002
Rebecca Miller	August - December 2002

Summer Interns (Minority students, Multicultural Academic Opportunities Program, MAOP)

Janeth Carranza	Prairie View A&M	Summer 2004
Jon Robinson	Cornell University	Summer 2003
Deanna Conquest	Delaware State University	Summer 2002

High school students

Laura Nessler	Blacksburg High School	Summer 2005
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August 00 – June 01

Supervisor of lab technician, and undergraduate students in Craig Nessler laboratory at Virginia Tech

Lab technician

Jocelyn Fraga-Müller	October 2000 to June 2001
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Undergraduate student workers

Jessica Radzio	August 2000 to June 2001
Scott McFarlain	October 2000 to June 2001

Teaching experience

Current

I will teach the “Molecular Genetics and Genomics Class” in collaboration with Dr. Soo Ahn. Fall 2007.

Participating in the “2007 CSI Camps I and II”, Arkansas State University, June 18-29, Jonesboro, AR. I

am developing a class and hands-on module on molecular speciation of cultivars of Arabidopsis.

I am developing the syllabus of the Advance Biochemistry (“Biochemistry II”) class, Department of Chemistry and Physics, ASU, to start on fall 2007.

I am developing the proposal for a new major in Biochemistry in collaboration with Dr. John Pratte.

Taught a section of “Topics in Molecular Biosciences” (MBS 7123, 6 students), ASU, March 13-29, 2007.

Taught “Making Connections” class. PSCH 1913 sections 001 and 003 (24 students), Department of Chemistry and Physics. ASU, fall 2006.

Taught “Topical Seminar in Phytoremediation” ESCI 7121-002 (6 students). The co-instructors were Drs. Robyn Hannigan, Fabricio Medina-Bolivar, Jennifer Bouldin, David Gilmore, and Kelly Redeker. ASU, fall 2006.

Taught “Research in Chemistry: Phytoremediation” CHEM 427V 005 to Rodney S. Harris (undergraduate). ASU, fall 2006.

Invited lecture to “Agriculture and the Environment” class (AGRI 4223) led by Dr. William Baker

“Genetically modified plants: issues and opportunities”. ASU, November 14, 2006.

Co-organized “1st International Workshop on Hairy Roots: Exploiting Plant Metabolism for Agriculture and Medicine” in collaboration with Dr. Fabricio Medina-Bolivar. Undergraduate and graduate students were able to get credit for enrolling in the workshop and attending additional sessions of classes and approving a test and final project. The name of the classes and corresponding codes are:

“Biotechnological applications of hairy root cultures” BIOL 4441 (undergraduates) and BIOL 5441 (graduates), also “Exploiting Plant Metabolism for Agriculture and Medicine” ESCI 7121 (graduates).

Participation in the “2006 CSI Advanced Camp”, Arkansas State University, June 26-30, Jonesboro, AR.

Developed class and hands-on module on thin layer chromatography of plant pigments. The CSI Camp was the lead story on Monday June 26 of KAIT TV 8 and also the lead story at the front page of *The Jonesboro Sun* on July 1st, 2006.

Developed the syllabus of the “Molecular Genetics and Genomics” class (course 6243), Molecular Biosciences Graduate Program, ASU, to start on fall 2007.

April 17, 2006. Invited lecture for McNair Scholars, Arkansas State University, Jonesboro, AR. Topic: "Studying and manipulating vitamin C levels in plants".

Past

September 28-30, 2004. Invited lectures in the advance course: Advanced Plant Physiology and Metabolism I. Fall 2004. PPWS/HORT 5524. Lecture: "Genome Organization and Expression". Virginia Tech.

March 4, 2004. Invited lecture in the advanced course: Topics in Molecular, Cell Biology and Biotechnology Spring 2004. ALS/BCHM/BIOL/PPWS Departments. Lecture: "Metabolic Engineering of Plant Antioxidants". Virginia Tech.

August – December 2001, January – July 1999. Co-lecturer for the advanced course in Molecular Biology for graduate students, *CEIB/UAEM*.

September 19, 2001. Lecturer of course "Applications of Genetic Engineering in Health, Agriculture, Food Production and Protection of the Environment" for high school Biology teachers. *AgroBio México*.

August 21, 2001. Co-lecturer for the workshop "Teaching Methodologies, Genetics and Environmental Impact" for high school Biology teachers. *Dirección de Educación Media Superior/UAEM*.

July – August 2001. Co-lecturer for the introductory course in Molecular Biology for freshman Biology students, *Facultad de Biología/UAEM*.

May – September 1999. Lecturer for the course "Mexican Biotechnology Today" for graduate students. *CEIB/UAEM*.

January 1999. Co-lecturer for the advanced course "Introduction to Modern Genetics and Biodiversity" for high school Biology teachers. *Coordinación del Nivel Medio Superior/UAEM*.

July- September 1998. Lecturer for the course "Biotechnology and Its Applications" for graduate students. *CEIB/UAEM*.

August 10-15, 1998. Co-lecturer for the course "Advanced Topics of Modern Biology" for Biology high school teachers. *Coordinación del Nivel Medio Superior/UAEM*.

February – July 1999, August 1998 – January 1999, February – July 1998. Lecturer for the basic course in Physicochemistry for Biology Majors, *Facultad de Biología/UAEM*.

November 3-7, 1997. Co-lecturer for the Theoretical-Practical Course "Biotechnology of *Bacillus thuringiensis*". *Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León (UANL)*.

October 3-14, 1994. Co-lecturer for the 5th Advanced Course of "Biotechnological Processes: Biotechnological Applications in Integrated Pest Management for Crops", *Instituto de Biotecnología (IBT/UNAM)*, Biotechnology Program for Latin America and the Caribbean/UNIDO, and *CEIB/UAEM*.

Manuscript reviewer for refereed journals

African Journal of Biotechnology

Biotechnology Progress

In Vitro Plant

Journal of Agricultural and Food Chemistry

Journal of Plant Physiology

Nanomedicine

Plant Cell Reports

Plant Physiology and Biochemistry

Transgenic Research

Trends in Plant Sciences

ARS/USDA (reviewed paper submitted to *Phytochemistry*)

Grant proposal reviewer

External Evaluator *Ad-Honorem*, *Secretaría Nacional de Ciencia, Tecnología e Innovación (SENACYT)*, Panama, Panama (2007)

National Science Foundation, Integrative Plant Biology - Functional and Regulatory Systems Cluster (2006).

National Science Foundation, Division of Biological Infrastructure – Research Experience for Undergraduates Sites (2005).

BARD, the United States - Israel Binational Agricultural Research & Development Fund (2004).

Universidad Autónoma del Estado de Morelos, Cuernavaca, México (1997).

Service

Arkansas State University

Member of the Arkansas State University Biosafety Committee, June 2006 - present.

Member of the Faculty Research Awards Committee, September 2006 - August 2007.

Member of the Arkansas Biosciences Institute Outreach Program. Conduct tours of ABI (an average of 3 per month) and hands on activities for students (3rd grade – college level), teachers, and other visitors, August 2005 – present.

Developed and conducted hands on activity and teaching materials for 6th grade students on the topic on “Colors in Food”; 21 students from Blessed Sacrament School came to ABI on April 24, 2007 (12:30 to 2:30 pm).

Developed and conducted hands on activity on “Colors in Food” for 9th grade female students as part of “Girls of Promise” 2007 event. March 31, Jonesboro, AR (8 am to 3 pm).

Member of the Search Committee for an Assistant Professor in Organic Chemistry. Department of Chemistry and Physics, August 2006 – January 2007.

My laboratory was selected as one of the highlights for the “Legislative ABI Tour” by Dr. Carole Cramer, Executive Director of ABI, October 7, 2006 (2:30 -3:30 pm).

Member of the Search Committee of an Assistant Professor in Analytical Forensic/Environmental Chemistry, Department of Chemistry and Physics, August 2005 – January 2006.

Member of Search Committee, Professor and Director of Molecular Biosciences Graduate Program, Arkansas Biosciences Institute, January - August 2006.

Member of Search Committee, Post-doctoral Research Associate for the laboratory of Dr. Elizabeth Hood, January – February 2007.

Developed and conducted hands on activity on “plant pigments fun and color” for 5th and 6th grade girls as part of the Women in Science and Technology (WITS) 2006 event. November 11, Jonesboro, AR (6 groups of 7-15 girls, 30 minutes each).

Host of Dr. Michael Vickery. Dr. Vickery demonstrated and trained users in SmartCycler technology for real time detection of nucleic acids. December 12, 2006.

On-site administrator of the Promega Freezer. This freezer serves several laboratories doing molecular biology at ASU (November 2005 – present).

Universidad Autónoma del Estado de Morelos (UAEM)

Member of *Centro de Investigación en Biotecnología (CEIB/UAEM)*-Graduated Students Admission Committee (1998-2002).

Community Service

Judge of the 2006 Science Fair, Blessed Sacrament School, Jonesboro, AR, March 10, 2006.

Judge of the 2007 Science Fair, Blessed Sacrament School, Jonesboro, AR, March 15, 2007.

Synergistic activities

Main coordinator of signature of Memorandums of Agreement and Understanding between Arkansas State University and Universities in México and Brazil:

- Division of Natural Sciences and Engineering, *UAM-Cuajimalpa*, México (liaison Dr. Rodolfo Quintero), signed: April 2007.
- Academic Body of Natural Products, *UAEM*, Cuernavaca, México (liaison Dr. María Luisa Villarreal), signed: April 2007.
- Department of Pharmacy, *Facultad de Química, UNAM*, Mexico City, México (liaison Dr. Rachel Mata), in progress.
- CINVESTAV-Irapuato, Irapuato, México (liaison Dr. Edmundo Lozoya), in progress.
- Universidad Federal de Santa Catarina, Florianópolis, Brazil (liaison Dr. Claudia Maria Oliveira Simões), in progress.

Main coordinator and host of visits of international speakers to ABI/ASU

- Dr. Rachel Mata (October 16-18, 2006)
- Dr. Rodolfo Quintero (November 1-4, 2006),
- Dr. Rogelio Pereda-Miranda (November 30 - December 9, 2006)
- Dr. Mario De Tullio (August 28-30, 2007)

Co-organizer of the “International Consortium of Collaboration in Plant-Powered Production” This effort involves research institutes and universities from Argentina, Brazil, Perú, México, and USA.

Main coordinator of content design and printing of brochures and posters to recruit students to the Graduate Program in Chemistry, Department of Chemistry and Physics, ASU. Among other activities I searched for funds in the office of Dr. Glen Jones, gathered pictures from all colleagues and co-wrote wording for the brochure and poster in collaboration with Drs. John Pratte and Robyn Hannigan.

Co-organized “1st International Workshop on Hairy Roots: Exploiting Plant Metabolism for Agriculture and Medicine” in collaboration with Dr. Fabricio Medina-Bolivar. July 13 2006, Jonesboro, AR.

Provided molecular expertise to Hector Estrada, Jane Anfinson, and Troy Bader, students of Dr. James Bednarz (Dept. of Biological Sciences, ASU), in the development of molecular speciation assays for their respective projects (Summer 2006 –Spring 2007).

Provided analytical expertise to the laboratories of Drs. Kris Biondolillo and Amy Pearce (ABI, ASU), in the development of a TLC method to measure cotinine in plasma samples. October-December 2006.

Advisor for MS and PhD students, Molecular Biosciences Program (August 2005 to date).

Advisor for MS and PhD students, Environmental Sciences Program (July 2006 to date).

Member of the Faculty Women’s Club, Arkansas State University, Jonesboro, AR 72401, October 2005 to present.

Member of “Women in Science” - ASU Chapter, September 2006 to present.

Membership in professional societies

American Association for the Advancement of Science (AAAS), 2001 to present.

American Chemical Society (ACS), 2005 to present.

American Society of Pharmacognosy (ASP), 2001 to present.

American Society of Plant Biologist (ASPB) 2000 to present.

Arkansas Academy of Science, 2006 to present.

Mexican Society of Biotechnology and Bioengineering (SMBB), 1993 to present.

Phytochemical Society of North America (PSNA), 2002 to present.

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) 2006 to present.

Arkansas Native Plant Society, 2006 to present.

May, 2007.