

CURRICULUM VITAE

Argelia Lorence, Ph.D.

Assistant Professor in Metabolic Engineering
Arkansas Biosciences Institute and Department of Chemistry and Physics
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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. Adviser: 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. Adviser: 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

"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.

Participation in a 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 to 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 and manipulation of the vitamin C – cell wall metabolic network in *Arabidopsis thaliana*.

Role of ascorbate in control of aging and reproductive activity in plants

Survey of the vitamin C foliar content of plants of the mustard family growing in the State of Arkansas (collaboration with Dr. Staria Vandepool).

Metabolite profiling of the vitamin C metabolic network in plants (collaboration with Dr. Robyn Hannigan).

Metabolite profiling of plant extracts as fingerprints for forensic applications.

Metabolic engineering for the enhancement of the nutritional and agronomical properties of crops.

Metabolic engineering of phytoalexins produced by tobacco and *Hyoscyamus muticus* hairy root cultures (collaboration with Dr. Fabricio Medina-Bolivar).

Metabolic engineering of triterpenes with sedative properties produced by *Galphimia glauca* cell and hairy roots cultures (collaboration with Drs. María Luisa Villarreal and Rogelio Pereda-Miranda).

Mechanisms of toxicity and remediation strategies of Superfund environmental toxicans (collaboration with PIs working at UAMS, UAF, NCTR, and ASU).

Extensive teaching and mentoring activities (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 *Associate 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.

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

- 2006 Travel Award, Committee on the Advancement of Women Chemists (COACH).
2002 **Arthur Neish Young Investigator Symposium Speaker**, Phytochemical Society of North America (PSNA)
2002 Post-doctoral Travel Award, Virginia Tech.
2000 Post-doctoral Fellow, *UAEM*, México.
1999-2001 **Young Investigator Award Winner (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 Ph.D. class 1997).
1997 "Gabino Barreda" Medal, (1st place M.S. class 1995).
1995-2001 Scholar, *Sistema Nacional de Investigadores (SNI)*, México.
1992-1997 Scholar, *CONACYT*, México. Funding for M.S. and Ph.D. 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: "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

Start-up package (PI Argelia Lorence)

Award: \$200,000.00 (August 05 - June 07).

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)

Award: \$603,574 (January 06 - December 10)

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 06 - June 07).

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. Redecker (Co-PIs)

Award: \$20,000.00 (July - December 06).

Past

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

Agency: Tobacco Initiative Fund, Virginia Tech

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

Award: \$29,000.00 (November 04 - July 05).

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 99 - December 01).

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 (95-97).

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. Adviser: 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

Adviser: 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)

Peer-reviewed publications

1. 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.
2. A Lorence, F Medina-Bolivar and CL Nessler (2004) Camptothecin and 10-Hydroxycamptothecin from *Camptotheca acuminata* Hairy Roots. *Plant Cell Reports* 22: 437-441.
3. 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.
4. A Lorence and R Verpoorte (2004) Gene Transfer and Expression in Plants. *Methods in Molecular Biology* 267: 329-350.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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, M Reidy and CL Cramer (2006) Current Approaches to Gene Transfer and Expression in Plants. In preparation to *Molecular Biotechnology*.
2. A Lorence, BJ Woffenden, J Martínez-Quintana, S Simeon, L Nopo-Olazabal, CL Nessler, and Fabricio Medina-Bolivar (2006) Enhanced production of specialized metabolites in tobacco over-expressing an AP2-type transcription factor. In preparation to *Plant Physiology*.
3. W Zhang, A Lorence, CL Nessler, and BI Chevone (2006) 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*.
4. KA Lisko, S Simeon, J Martínez-Quintana, W Zhang, B Jullian, MM Vaughan, BI Chevone, A Lorence and CL Nessler (2006) Metabolic engineering for increased ascorbic acid also increases stress-tolerance in Arabidopsis and tobacco. In preparation to *New Phytologist*.
5. A Lorence, A Rogers, J Martínez, P Mendes, W Zhang, BI Chevone, and CL Nessler (2006) Identification and characterization of glucuronic acid reductases in *Arabidopsis thaliana*". In preparation to *Plant Journal*.
6. A Lorence, J Robinson, BI Chevone, P Mendes, and CL Nessler (2006) 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.*

Book chapters

1. A Lorence and CL Nessler (2006) Pathway engineering of the plant vitamin C metabolic network. In "Applications of Plant Metabolic Engineering". R Verpoorte, AW Alfermann and TS Johnson (eds). Springer Verlag. In press.
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.

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.

State of the Art 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 Peper" (*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 Ortíz, 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

Lectures

1. 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, L Nopo-Olazabal, CL Nessler, and F Medina-Bolivar.
2. Special seminar, July 7, 2006, Plant Biotechnology Discussion Group at ABI/ASU, Jonesboro, AR. "What is an ORCA doing in my tobacco?" A Lorence.
3. 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.
4. Special seminar, May 26, 2006, Plant Biotechnology Discussion Group at ABI/ASU, Jonesboro, AR. "Synopsis of Symposium: RNA Biology – Novel Insights from Plants" A Lorence.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.

11. 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](#).
12. 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](#).
13. 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](#).
14. **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.
15. Invited seminar, Molecular Biology Seminar Series, CINVESTAV- Irapuato, Irapuato, México, March 20, 2002 "The relationship between ORCAs and the joy tree" [A Lorence](#).
16. Invited seminar, Molecular Biology Seminar Series, CINVESTAV- Irapuato, 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](#).

Posters

1. 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](#).
2. 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](#).
3. 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, S Simeon, J Martínez-Quintana, B Jullian, M Vaughan, BI Chevone, CL Nessler and [A Lorence](#).
4. 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.
5. 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 Martinez-Quintana, J Robinson, W Zhang, P Mendes, BI Chevone and CL Nessler.
6. 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.
7. 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.
8. 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.
9. 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, C Nessler, A Lorence and F Medina-Bolivar.
10. 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.
 11. 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.
 12. 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.
 13. 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” JF Robinson, A Lorence, BI Chevone, P Mendes and CL Nessler.
 14. 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.
 15. 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.
 16. 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.
 17. 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.
 18. 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.
 19. 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.
 20. 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 δ -Endotoxin in *Trichoplusia ni* Midgut?” A Lorence, A Darszon, and A Bravo.
 21. 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.
 22. 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.

23. 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.
24. 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.
25. 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.
26. 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 Channel in BBMV Containing Functional Receptors" C Díaz, A Lorence, A Darszon, A Liévano, R Quintero, and A Bravo.
27. Second Meeting of the Mexican Society of Cell Biology, October 5-7, 1994, Mexico City, Mexico "Effect of *Bacillus thuringiensis* δ -endotoxins on the permeability of *Spodoptera frugiperda* brush border membrane vesicles" A Lorence, A Darszon, R Quintero and A Bravo.
28. 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.
29. 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 δ -endotoxins of *Bacillus thuringiensis*" A Lorence, A Darszon, R Quintero and A Bravo.
30. 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.
31. 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.
32. 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.
33. IV National Congress of Biotechnology and Bioengineering, SMBB, September 8-12, 1991, Mexico City, Mexico "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.
34. 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, June 26, 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. My book entitled "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, College of Communications Building. September 14th 2005, Jonesboro, AR.
3. TV interview about "Biotechnology in Mexico". November 10, 2001, Mexico City, México.

Papers I have 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 (main adviser)

Lab technicians

Javier Martínez-Quintana
Shannon Hill (part time)

January 06 to present
September 05 to present

Graduate student

Scott Simeon MS-Chemistry

January 06 to present

Visiting scholar

Audrei Nisio BS-Biology, Brazil

July 06 to present

Undergraduate students

Katherine Lisko	BS-Forensic Science	October 05 – present
Shea Harris	BS-Biology	July 06 - present
Gwendolyn Wilson	BS-Biology	Fall 06

Summer interns

Gwendolyn Wilson	McNair Scholar	ASU-Biology	Summer 06
Jeannette Uwase	RISE Scholar	Ivy Tech CC	Summer 06

As an Associate Professor (México)

1999-2003 Main adviser of honors thesis students

<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 Membership on tutorial committee of graduate students

<i>Student</i>	<i>Degree</i>	<i>Period</i>	<i>Year granted</i>
Nubia C Moreno-Sarmiento	MS	1998-1999	March 99
Rubí Hernández-Rubio	MS	1998-1999	Sep 99
Alfredo Regalado-Páramo	MS	1998-2001	Aug 01
Víctor H Chávez-Tovar	MS	2001-2003	July 03
María Alejandra Brito-Cruz	MS	2000-2002	Dec 03
Lucila Valdéz-Castro	PhD	1999-2003	June 03

As a Post-doctoral Research Associate

April 02 – July 05

Supervised lab technicians, graduate students, undergraduate student workers and summer interns in the Craig Nessler laboratory at Virginia Tech

Lab technicians

Martha Vaughan	March to August 05
Amy Vance	November 02 to February 05
Karen Stump	April to July 02

Graduate students

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

Visiting scholars

Berangère Jullian	Universite D'Auvergne (France)	April - August 05
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Undergraduate students

Catherine O'Mara	March 04 to August 05
James A Gardner	August 04 to August 05
Joseph D Wood	January to August 05
Jennifer A Witten	March to August 05
Thomas R Evans	April to August 05

Amber M Rogers	September 02 to May 05
Martha Vaughan	September 03 to February 05
Melanie Turner	May 02 to January 05
Katherine Mitchell	May 02 to July 04
Jefferson Stroud	May 03 to February 04
Courtney Rudd	April 2002 to April 2003
Kristos Vaughan	February to December 04
David Harbourt	February to August 04
Jessica Caldwell	September to December 02
Rebecca Miller	August to December 02

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

Janeth Carranza	Prairie View A&M	Summer 04
Jon Robinson	Cornell University	Summer 03
Deanna Conquest	Delaware State University	Summer 02

August 00 – June 01

Supervised lab technician, and undergraduate student workers in the Craig Nessler laboratory at Virginia Tech

Lab technician

Jocelyn Fraga-Müller October 00 to June 01

Undergraduate student workers

Jessica Radzio August 00 to June 01
 Scott McFarlain October 00 to June 01

Teaching experience

Current

July 20, 2006. Invited lecture for RISE Scholars, Arkansas State University, Jonesboro, AR.

Topic: "The Importance of Networking".

One of the faculty participating in the 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.

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. Undergraduate and graduate students will be 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).

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

April 17, 2006. Invited lecture for McNair Scholars, Arkansas State University, Jonesboro, AR.

Topic: "Studying and manipulating vitamin C levels in plants".

Developing syllabus of the "First Year Experience" class, Department of Chemistry and Physics, ASU, to start on Fall 2006.

Developing syllabus of the Advance Biochemistry (Biochemistry II) class, Department of Chemistry and Physics, ASU, to start on Spring 2007.

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

In Vitro Plant

Journal of Agricultural and Food Chemistry

Nanomedicine

Plant Cell Reports

Plant Physiology and Biochemistry

Trends in Plant Sciences

Grant proposal reviewer

National Science Foundation, Division of Biological Infrastructure – Research Experience for Undergraduates Sites (05)

BARD, the United States - Israel Binational Agricultural Research & Development Fund (04)

Universidad Autónoma del Estado de Morelos, Cuernavaca, México (97).

Service

Arkansas State University

Member of the Arkansas State University Biosafety Committee, June 06 - present.

Member of Search Committee, Assistant Professor in Analytical Forensic/Environmental Chemistry, Department of Chemistry and Physics, August 05 – January 06.

Member of Search Committee, Professor and Director of Molecular Biosciences Graduate Program, Arkansas Biosciences Institute, January 06 – present.

Active participant in the Outreach Program of the Arkansas Biosciences Institute (ABI). Conduct tours of ABI and hands on activities for students (3rd grade – college level), teachers, and other visitors, August 05 – 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, 06 (3 h).

Synergistic activities

Member of the Faculty Women's Club, Arkansas State University, Jonesboro, AR 72401, October 05 to present.

Main coordinator of collaboration agreements between Arkansas State University and prestigious Universities and Research Institutes in México (e.g. *UNAM, UAM, UAEM, CINVESTAV-Irapuato*). On-going.

Membership in professional societies

American Chemical Society (ACS), 05 to present

American Society of Pharmacognosy (ASP), 01 to present.

American Society of Plant Biologist (ASPB) 00 to present.

Arkansas Academy of Science, 06 to present.

Mexican Society of Biotechnology and Bioengineering (SMBB), 93 to present.

Phytochemical Society of North America (PSNA), 02 to present.

Sigma Xi, June 06 to present.

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), July 06 to present.

July 18, 2006.