

CURRICULUM VITAE

Name: Luis Rafael Herrera-Estrella

Citizenship: Mexican

Present position:

President's Distinguished Professor of Plant Genomics and Director of the Institute of Genomics for Crop Stress Tolerance, Texas Tech University.

Emeritus Professor Unidad de Genómica Avanzada del Centro de Investigación y de Estudios Avanzados

Visiting Professor College of Resources & Environmental Sciences, Nanjing Agricultural University

Education

Postdoctoral: May 1984-March 1986 Department of Genetics

State University of Ghent, Belgium

Ph.D.: September 1981-May 1984 Department of Genetics

State University of Ghent, Belgium

M.Sc.: September 1978-May 1980 Department of Genetics and Molecular Biology, Centro de Investigación y de Estudios Avanzados del I.P.N.

B.Sc.: July 1974-June 1978 Escuela Nacional de Ciencias Biológicas

Instituto Politécnico Nacional

Honors and awards

"The Minoru and Ethel Tsutsui Distinguished Graduate Research Award in Science", The New York Academy of Sciences (U.S.A.) 1984.

Javed Husain Award for young Scientists 1987 UNESCO. Paris 1987.

Natural Sciences Award from the National Academy of Science (Mexico). 1989

"Third World Academy of Science Award in Biology". The Third World Academy of Science (Abuja, Nigeria). 1993

Gold Medal from the World Intellectual Property Organization as one of the most distinguished Inventors in Mexico, 2000 (Only 3 Mexican citizens have received this honor)

Steering Committee University of United Nations Biotechnology Program for Latin America 1990-2001 Howard Hughes Medical Institute – International Research Scholar 1991-2011

President, International Society of Plant Molecular Biology, 2001-2003

International Scholar Howard Hughes Biomedical Institute, 1991- 2011

Premio Nacional en Ciencias y Artes (National Science and Art Prize) in the field of Physical, Mathematical and Natural Sciences, awarded by the Mexican President, 2002

Elected Foreign Associate Member of the National Academy of Sciences, USA. 2003

Elected Member of the Third World Academy (TWAS). 2004

International Recognition for promoting Science and Technology in Developing Countries. "The 2007 Trieste Science Prize, in Agricultural Sciences". 2007

Elected Member of the National Academy of NY, 2008.

"Heberto Castillo" Award by Science and Technology Council of Mexico City, 2008.

Senior International Research Scholar Howard Hughes Biomedical Institute, 2012-2016.

Prize "Dr. Luis Federico Leloir" 2012, Award by the Ministry of Science, Technology and Innovation, Government of Argentina.

Corresponding Membership Award 2013. American Society of Plant Biologists (ASPB). 2013.

Elected as one of the 100 most influential people in biotechnology. Scientific American, August 2015.

Elected Member of the Academy of Medicine, Engineering and Science of Texas-2019

Elected Member of the National Academy of Inventors-2019

Students graduated under Dr. Herrera's direction

B.Sc. 17

M.Sc. 21

PhD. 46

Presentations as an invited speaker

More than 200

PATENTS

1. Recombinant DNA which can be introduced into plant cells. EP 0189707 B1. 1986.
2. Process for the introduction of expressible genes into plant cell genomes and *Agrobacterium* strains carrying hybrid Ti plasmid vectors useful for this process. EP 0116718 B1. 1990.
3. Use of transit peptides for the introduction of polypeptides into plant chloroplasts.
4. Método para la obtención de plantas transgénicas que tienen una capacidad mejorada para la toma de nutrientes y la tolerancia a compuestos tóxicos presentes en el suelo. WO 1999063100 A1. 1999.
5. Chimeric gene coding for a transit peptide and a heterologous peptide US6063601 A. 2000.
6. "Transformación Genética del Género Agave y Producción de Plantas Transgénicas resistentes a Herbicidas" No. JL/a/2002/000044.
7. Process for obtaining transgenic plants which have an improved capacity for the uptake of nutrients and tolerance to toxic compounds which are presents in the soil. US20050137386, 2005.
8. Transgenic plants that metabolize a reduced form of phosphorus. E.U.A, 2009.
9. System for using phosphite as an herbicide. E.U.A, 2010.
10. "Transgenic plants and fungi capable of metabolizing phosphite as source of phosphorus". E.U.A. US2011/0231952 A1, 2011.
11. System for protection of plants from pathogens using alkamides. E.U.A, WO 2010015932 A2. 2011.
12. Photosynthetic organisms and cells adapted to metabolize phosphite as a source of phosphorus.. E.U.A. US 20120295303 A1. 2012.

13. Fungi adapted to metabolize phosphite as a source of phosphorus. E.U.A., US 20120285210 A1. 2012.
14. Plant cultivation system utilizing phosphite as a nutrient and as a control agent for weeds and algae. WO/2012/076984 A2. 2012.
15. Transgenic plants capable of metabolizing phosphite to reduce competition from weeds US 20130067975 A1. 2013.
16. Patent application: TTU Ref 2020-078-Tissue Culture-Independent Gene Editing of Cells-Winstead Ref. No. 13368-P022V1, 2020
17. **Patent application:** A nitrate transporter induced by mycorrhiza and its application to improve nitrogen nutrition in rice, 2020.

List of publications:

1. Herrera-Estrella, L., and Ruiz-Herrera, J. (1981). Chemical and structural changes in chitin-synthetase and wall structure phototropic responses in phycomyces. *J. Biol. Chem* 256: 1458-1463.
2. Herrera-Estrella, L., Chavez B., and Ruiz-Herrera, J. (1982). Presence of chitosomes in the cytoplasm of *Phycomyces blakesleeanus* and the synthesis of chitin microfibrils. *Exp. Mycol* 6: 385-388.
3. Herrera-Estrella, L., Depicker, A., Van Montagu, M., and Schell, J. (1983). Expression of Chimaeric genes transferred in to plant cells using a Ti plasmid-derived vector. *Nature (London)* 303: 209-213.
4. Herrera-Estrella, L., De Block, M., Messens, E., Hernalsteens J.P., Van Montagu, M., and Schell, J. (1983). Chimeric genes as dominant selectable markers in plant cells. *EMBO J* 2: 987-995.
5. Caplan, A., Herrera-Estrella, L., Inze, D., Van Haute, E., Van Montagu, M., Schell, J., and Zambryski, P. (1983). Introduction of genetic material into plant cells. *Science* 222: 815-821.
6. Herrera-Estrella, L., and Ruiz-Herrera, J. (1983). Light response in *Phycomyces blakesleeanus*: evidence for roles of chitin biosynthesis and breakdown. *Experimental Mycology* 7:362-369.
7. Herrera-Estrella, L., Van Den Broeck, G., Maenhaut, R., Van Montagu, M., Schell, J., Timko, M., and Cashmore, A. (1984). Light-inducible and chloroplast-associated expression of a chimaeric gene introduced into *Nicotiana tabacum* using a Ti plasmid vector. *Nature (London)* 310:115-120.
8. De Block, M., Herrera-Estrella, L., Van Montagu, M., Schell, J., and Zambryski, P., (1984). Expression of foreign gene in regenerated plants and their progeny. *EMBO J* 3: 1681-1689.
9. Wang, K., Herrera-Estrella, L., Van Montagu, M., and Zambryski, P. (1984). The right copy of the 25-bp terminus sequence of the nopaline T-DNA is essential for and determines the direction of DNA transfer from *Agrobacterium* to the plant cell genome. *Cell* 38: 455-462.
10. Van Den Broeck, G., Timko, M.P., Kausch, A.P., Cashmore, A.R., Van Montagu, M., and Herrera-Estrella, L. (1985). Targeting of a foreign protein to chloroplasts by fusion to the transit peptide of ribulose-1, 5-biophosphate carboxylase. *Nature (London)* 313: 358-363.
11. Deshayes, A., Herrera-Estrella, L., and Caboche, M. (1985). Liposome-mediated transformation of tobacco mesophyll protoplasts by an *Escherichia coli* plasmid. *EMBO J* 4: 2731-2737.
12. Hain, R., Stabel, P., Czernilofsky, A.P., Steinbiss, H.H., Herrera-Estrella, L., and Schell, J. (1985). Uptake, integration, expression and genetic transmission of a selectable chimaeric gene by plant protoplasts. *Mol. Gen. Genet* 199: 161-177.
13. Cashmore, A., Szabo, L., Timko, M., Kausch, A., Van Den Broeck, G., Schreier, P., Bohnert, H., Herrera-Estrella, L., Van Montagu, M., and Schell, J. (1985). Import of polypeptides into chloroplasts. *Nature Biotechnology* 3:803-808.
14. Simpson, J., Timko, M.P., Cashmore, A.R., Schell, J., Van Montagu, M., and Herrera-Estrella, L. (1985). Light-inducible and tissue-specific expression of a chimaeric gene under control of the 5'-flanking sequence of a pea chlorophyll a/b-binding protein gene. *EMBO J* 4: 2723-2729.

15. Simpson, J., and Herrera-Estrella, L. (1985). The 5'-flanking sequences of a chlorophyll a/b-binding protein gene direct light-regulated and tissue-specific expression of a chimaeric gene. *Arch. Int. Physiol. Biochim* 93: B174.
16. Timko, M.P., Kausch, A.P., Castresana, C., Fassler, J., Herrera-Estrella, L., Van Den Broeck, G., Van Montagu, M., and Cashmore, A.R. (1985). Light regulation of plant gene expression by an upstream enhancer like element. *Nature (London)* 318: 579-582.
17. Schell, J., Kaulen, H., Kreuzaler, F., Eckes, P., Rosahl, S., Willimitzer, L., Spena, A., Baker, B., Herrera-Estrella, L., and Fedoroff, N. (1985). Transfer and regulation of expression of chimeric genes in plants. *Cold Spring Harbor Symp. Quant. Biol.* 50: 421-431.
18. Czernilofsky, A.P., Hain, R., Herrera-Estrella, L., Lorz, H., Goyvaerts, E., Baker, B., and Schuell, J. (1986). Fate of selectable marker DNA integrated into the genome of *Nicotiana tabacum*. *DNA* 5: 101-113.
19. Simpson, J., Van Montagu, M., and Herrera-Estrella, L. (1986). Photosynthesis-associated gene families: differences in environmental and tissue specific responses. *Science* 233: 34-38.
20. Teeri, T.H., Herrera-Estrella, L., Depicker, A., Van Montagu, M., and Palva, E.T. (1986). Identification of plant promoters in situ by T-DNA mediated transcriptional fusions to the npt-II gene. *EMBO J* 5: 1755-1760.
21. Simpson, J., Schell, J., Van Montagu, M., and Herrera-Estrella, L. (1986). The light-inducible and tissue-specific expression of a pea HPLC gene involves an upstream element with enhancer-and silencer like properties. *Nature (London)* 323: 551-554.
22. Horth, M., Negrutiu, I., Burny, A. Van Montagu, M. and Herrera-Estrella, L. (1987). Cloning of a *Nicotiana plumbaginifolia* protoplast-specific enhancer-like sequence. *EMBO J* 6: 2525-2530.
23. Cano C, Herrera-Estrella L, and Ruiz Herrera J. (1988). DNA Methylation and Polyamines in Regulation of Development of the fungus *Mucor rouxii* . *Journal of Bacteriology* 170: 5946-5948.
24. Van Den Broeck, G., Van Houtuen, A., Van Montagu, M. and Herrera-Estrella, L. (1988). The Transit Peptide of a Chlorophyll a/b Binding Protein is not Sufficient to Insert Neomycin Phosphotransferase II in the Thylakoid Membrane. *Plant Science* 58: 171 - 176.
25. Teeri, T.H., Lehvaslaiho, H., Franck, M. Votila J., Heino P., Palva E.T., Van Montagu M. and Herrera-Estrella L. (1989). Gene Fusions to lac Z reveal new Expression Patterns of Chimeric Genes in Transgenic Plants. *EMBO J* 8:343-350.
26. Mosqueda, G., Van Den Broeck, G., Saucedo, O., Bailey, A.M., Alvarez-Morales, A. and Herrera-Estrella L. (1990). Isolation and characterization of the gene form *Pseudomonas syringae* pv. phaseolicola encoding the phaseolotoxin-insensitive ornithine carbamoyltransferase *Mol. Gen. Genet* 222: 461-466.
27. Bailey, A.M., Mena, G.L., and Herrera-Estrella, L. (1991). Genetic transformation of the plant pathogen phytophthora parasitica. *Nucleic Acids Research* 19:4273-4278.
28. Zabaleta, E., Oropeza, A., Jiménez, B. Salcedo, G., Crespi, M. and Herrera-Estrella, L. (1992). Isolation and characterization of genes encoding chaperonin 60B from *Arabidopsis thaliana*. *Gene* 111: 175-181.
29. Arguello, G., García-Hernández, E., Sánchez, M., Gariglio, P., Herrera-Estrella, L. and Simpson, J. (1992). Characterization of DNA sequences that mediate nuclear protein binding to the regulatory region of the *Pisum sativum* (pea) chlorophyll a/b binding protein gene: Identification of a repeated heptomer motif. *The Plant Journal* 2: (3) 301-309.
30. Segura-Nieto, M., Vázquez Sánchez, N., Rubio-Velázquez, H., Olguín-Martínez, L., Rodríguez-Nester, C. and Herrera-Estrella, L. (1992). Characterization of amaranth (*Amaranthus hypochondriacus* L.) seed proteins. *J. Agricultural and Food Chemistry* 40: 1553-1558.
31. Ruiz-Medrano, R., Jiménez-Moraila, B., Herrera-Estrella, L. and Rivera-Bustamante, R. (1992). Nucleotide sequence of an osmotin like cDNA induced in tomato during viroid infection. *Plant Molecular Biology* 20: 1199-1202.
32. Assad-García, N., Ochoa-Alejo, N., García-Hernández, E., Herrera-Estrella, L. and Simpson J. (1992). Agrobacterium-mediated transformation of tomatillo (*Physalis ixocarpa*) and tissue specific expression of the 35S promoter in transgenic tomatillo plants. *Plant Cell Reports* 11: 558-562.

33. De La Riva G., Xoconostle-Cázares B., Gutiérrez C., Morán R., Alvarez A., Herrera-Estrella L. and Pérez S. (1992). Expresión heteróloga del gen que codifica para la delta-endotoxina activa de *Bacillus thuringiensis* var. tenebrionis en *E. coli*. *Biotech. Apl* 9:31-37.
34. De La Fuente-Martinez, J.M., Mosqueda-Cano, G., Alvarez-Morales, A., and Herrera Estrella, L. (1992). Expression of a bacterial phaseolotoxin resistant ornithyl transcarbamylase in transgenic tobacco confers resistance to *Pseudomonas syringae* pv. *phaseolicola*. *Biotechnology* 10: 905-910.
35. Bailey A., Mena G. and Herrera Estrella L. (1993). Transformation of four pathogenic *Phytophthora* spp. by microprojectile bombardment on intact mycelia. *Curr Genet* 23: 42-46.
36. Garzon-Tiznado J. A., Torres-Pacheco I., Ascencio-Ibañez J.T., Herrera-Estrella L. and Rivera-Bustamante R. (1993). Inoculation of peppers with infectious clones of a new geminivirus by a biolistics procedure. *Phytopathology* 83: 514-521.
37. Guevara-García A., Mosqueda-Cano G., Arguello-Astorga G., Simpson J. and Herrera-Estrella L. (1993). Tissue specific and wound-inducible pattern of expression of the mannopine synthase promoter is determined by the interaction between positive and negative cis-regulatory elements. *The Plant Journal* 4: 495-505
38. Torres-Pacheco, I., Garzón-Tiznado, J.A., Herrera-Estrella, L. and Rivera-Bustamante, R.F. (1993). Complete nucleotide sequence of pepper huasteco virus: analysis and comparison with bipartite geminiviruses. *Journal of General Virology* 74: 2225-2231.
39. De La Fuente-Martínez, J.M and Herrera-Estrella L. (1993). Strategies to design transgenic plants resistant to toxins produced by pathogens. *AgBiotech News and Inf* 5: 295-299.
40. Zabaleta E., Assad N., Oropeza A., Salerno G. and Herrera-Estrella L. (1994). Expression of one of the members of the Arabidopsis chaperonin 60b gene family is developmentally regulated and wound-repressible. *Plant Mol. Biol* 24: 195-202.
41. Villegas-Sepulveda, N., Jiménez Moraila, B., Herrera-Estrella, L., and Simpson, J. (1994). Characterization of *Amaranthus hypochondriacus* light-harvesting chlorophyll a/b-binding polypeptide cDNAs. *Plant Physiology* 105: 459-460.
42. Arguello-Astorga, G.R. Guevara-González, R.G. Herrera-Estrella L. and Rivera-Bustamante, R.F. (1994). Geminivirus Replication Origins Have a Group-Specific Organization of Iterative Elements: A Model for Replication. *Virology* 203: 90-100.
43. Arguello-Astorga, G. Herrera-Estrella, L and Rivera-Bustamante, R.F. (1994). Experimental and theoretical definition of geminivirus origin of replication. *Plant Molecular Biology* 26: 553-556.
44. Zabaleta, E., Oropeza, A., Assad, N., Mandel, A., Salerno, G. and Herrera-Estrella, L. (1994). Antisense expression of chaperonin 60B in transgenic tobacco plants leads to abnormal phenotypes and altered distribution of photosynthates. *The Plant Journal* 6:425-432.
45. Peñaloza-Vázquez, A., Mena, G., Herrera-Estrella, L and Bailey, A.M. (1995). Cloning and sequencing of the genes involved in glyphosate utilization by *Pseudomonas pseudomallei*. *Applied and Environmental Microbiology* 61: 538-543.
46. Herrera-Estrella L and Simpson J. (1995). Genetically engineered resistance to bacterial and fungal pathogens. *World Journal of Microbiology & Biotechnology* 11: 383-392.
47. Cabrera-Ponce, J.L. Vegas-García, A., and Herrera-Estrella, L. (1995). Herbicide resistant transgenic papaya plants produced by an efficient particle bombardment transformation method. *Plant Cell Reports* 15:1-7.
48. Pérez-Molphe-Balch, E., Gidekel, M., Segura-Nieto, M. Herrera-Estrella, L. and Ochoa-Alejo, N. (1996). Effects of water stress on plant growth and root proteins in three cultivars of rice (*Oryza sativa*) with different levels of drought tolerance. *Physiologia Plantarum* 96:284-290.
49. Mandel, M.A., Feldmann, K.A., Herrera-Estrella, L., Rocha-Sosa, M., and León, P. (1996). CLA1, a novel gene required for chloroplast development, is highly conserved in evolution. *The Plant Journal* 9(5): 649-658.
50. Gidekel, M., Jiménez, B., and Herrera-Estrella, L. (1996). The first intron of the Arabidopsis thaliana gene coding for elongation factor 1B contains an enhancer-like element. *Gene* 170: 201-206.

51. Valdéz-Alarcón, J.J., Fernando, M., Salerno, G., Jiménez-Moraila, B. and Herrera-Estrella, L. (1996). Characterization of a rice sucrose-phosphate synthase-encoding gene. *Gene* 170: 217-222.
52. Cabrera-Ponce, J.L., Vegas-García, A. and Herrera-Estrella, L. (1996). Regeneration of transgenic papaya plants via somatic embryogenesis induced by *Agrobacterium rhizogenes*. *In vitro Cell Dev. Bio* 32: 86-90.
53. Arguello-Astorga G.R. and Herrera-Estrella, L. (1996). Ancestral Multipartite Units in Light-Responsive Plant Promoters Have Structural Features Correlating with Specific Phototransduction Pathways. *Plant Physiology* 112: 1151-1166.
54. Cabrera-Ponce, J.L., López, L., Assad-García, N., Medina-Arevalo, C., Bailey, A.M. and Herrera-Estrella, L. (1997). An efficient particle bombardment system for the genetic transformation of asparagus (*Asparagus officinalis* L.). *Plant Cell Reports* 16:255-260.
55. De La Fuente, J.M., Ramírez-Rodríguez, V., Cabrera-Ponce, J.L. and Herrera-Estrella, L. (1997). Aluminum Tolerance in Transgenic Plants by Alteration of Citrate Synthesis. *Science* 276:1566-1568.
56. Mosqueda-Cano, G. and Herrera-Estrella, L. (1997). A simple and efficient PCR method for the specific detection of *Pseudomonas syringae* pv *phaseolicola* in bean seeds. *World Journal of Microbiology & Biotechnology* 13: 463-467.
57. González-Hernández, G.A. Herrera-Estrella, L. Rocha-Ramírez, V. Roncero M.I.G. and Gutiérrez-Corona, J.F. (1997). Biolistic transformation of *Mucor circinelloides*. *Mycol. Res* 101(8): 953-956.
58. Jofre-Garfias, A.E., Villegas-Sepúlveda, N., Cabrera-Ponce, J.L., Adame-Alvarez, R.M., Herrera-Estrella, L. and Simpson, J. (1997). *Agrobacterium*-mediated transformation of *Amaranthus hypochondriacus*: light-and tissue-specific expression of a pea chlorophyll a/b-binding protein promoter. *Plant Cell Reports* 16: 847-852.
59. Rossi, M., Carrari, F., Cabrera-Ponce, J.L., Vázquez-Rovere, C., Herrera-Estrella, L., Gudesblat, G. and Iusem, N.D. (1998). Analysis of an abscisic acid (ABA)-responsive gene promoter belonging to the *Asr* gene family from tomato in homologous and heterologous systems. *Mol. Gen Genet* 258: 1-8.
60. Arguello-Astorga G., and Herrera-Estrella, L. (1998). Evolution of Light-Regulated Plant Promoters. *Annu. Rev. Plant Physiol. Plant Mol. Biol* 49:525-555.
61. Váldez, M., Cabrera-Ponce, J.L., Sudhakar, D., Herrera-Estrella L. and Christou, P. (1998). Transgenic central american, west african and asian elite rice varieties resulting from particle bombardment of foreign DNA into mature seed-derived explants utilizing three different bombardment devices. *Annals of Botany* 82:795-801.
62. Guevara-García, A., López-Ochoa, L.,
63. López-Bucio, J., Simpson, J. and Herrera-Estrella, L. (1998). A 42 bp fragment of the *pmas1'* promoter containing an ocs-like element confers a developmental, wound- and chemically inducible expression pattern. *Plant Molecular Biology* 38: 743-753.
64. Curatti, L., Folco, E., Desplats, P., Abratti, G., Limones-Briones, V., Herrera-Estrella, L., and Salerno, G. (1998). Sucrose-phosphate synthase from *Synechocystis* sp strain PCC 6803: identification of the *spsA* gene and characterization of the enzyme expressed in *Escherichia coli*. *Journal of Bacteriology* 24: 6776-6779.
65. Herrera-Estrella, L., De La Fuente, J.M., Ramírez-Rodríguez, V., and Cabrera-Ponce, J.L. (1998). Expression of a Bacterial Citrate Synthase in the Cytoplasm of Transgenic Plants Leads to Aluminum Tolerance. (Abstract) *Purdue University. Ed. Robert E. Schaffert*
66. Ruíz-Medrano, R., Guevara-González, Rg, Arguello-Astorga, GR, Monsalve-Fonegra, Z., Herrera-Estrella, L., and Rivera-Bustamante, R. (1999). Identification of a sequence element involved in AC2 mediated transactivation of the pepper huasteco virus coat protein gene. *Virology* 253:162-169.
67. Herrera-Estrella, L. (1999). Transgenic plants for tropical regions: Some considerations about their development and their transfer to the small farmer. *Proc. Natl. Acad. Sci.* 96: 5978-5981.
68. De La Fuente-Martinez, J.M., and Herrera-Estrella, L. (1999). Advances in the understanding of aluminum toxicity and the development of aluminum tolerant transgenic plants. *Advances in Agronomy*, 66: 103-119.
69. Guevara-García, A., López-Bucio, J., and Herrera-Estrella, L. (1999). The mannopine synthase promoter contains vectorial cis-regulatory elements that act as enhancers and silencers. *Mol Gen Genet* 262: 608-617.

70. Ruíz-Herrera, J., León-Ramírez, C., Cabrera-Ponce, J.L., Martínez-Espinoza, A.D. and Herrera-Estrella, L. (1999). Completion of the sexual cycle and demonstration of genetic recombination in *Ustilago maydis* in vitro. *Mol. Gen. Genet* 262:468-472.
71. López-Bucio, J., Martínez De La Vega, O., Guevara-García, A., and Herrera-Estrella, L. (2000). Enhanced phosphorus uptake in transgenic tobacco plants that overproduce citrate. *Nature Biotechnology* 18: 450-453.
72. Chávez-Bárceñas, A.T., Váldez-Alarcón, J.J., Martínez-Trujillo, M., Chen, L., Xoconostle-Cazárez, B., Lucas, W.J., and Herrera-Estrella, L. (2000). Tissue-Specific and Developmental Pattern of Expression of the Rice *sps1* Gene. *Plant Physiology* 124: 641-653.
73. Curatti, L., Porchia, A.C., Herrera-Estrella, L. and Salerno, G. (2000). A prokaryotic sucrose synthase gene (*susA*) isolated from a filamentous nitrogen-fixing cyanobacterium encodes a protein similar to those of plants. *Planta* 211:729- 735
74. López-Bucio, J., Nieto-Jacobo, M.F., Ramírez-Rodríguez, V., and Herrera-Estrella, L. (2000). Organic acid metabolism in plants: from adaptive physiology to transgenic varieties for cultivation in extreme soils. *Plant Science* 16:1-13
75. Herrera-Estrella, L. (2000) Genetically modified crops and developing countries. *Plant Physiology* 124:923-925.
76. Herrera-Estrella, L. and Alvarez-Morales, A. (2001). Genetically modified crops: hope for developing countries? *EMBO Reports* 21 (4): 256-258.
77. Aguado-Santacruz, G.A., Cabrera-Ponce, J.L., Ramírez-Chavez, E., León-Ramírez, C.G., Rascón-Cruz, Q. and Herrera-Estrella, L. (2001) Establishment, characterization and plant regeneration from highly chlorophyllous embryogenic cell cultures of blue grama grass, *Bouteloua gracilis* (H.B.K.) Lag. ex Steud. *Plant Cell Reports* 20: 131-136.
78. Aguado-Santacruz, G.A., Cabrera-Ponce, J.L., Olalde-Portugal, V., Sánchez-González, M.R., Marquez-Guzmán, J., and Herrera-Estrella, L. (2001) Tissue culture and plant regeneration of blue grama grass, *Bouteloua gracilis* (H.B.K.) Lag ex steud. *In vitro Cellular and Development Biology-Plant* 37 (2):182-189.
79. Martínez-Hernández, A., López Ochoa, L., Argüello-Astorga, G., and Herrera-Estrella, L. (2002) Functional Properties and Regulatory Complexity of a Minimal *RBCS* Light-Responsive Unit Activated by Phytochrome, Cryptochrome, and Plastid Signals. *Plant Physiology* 128: 1223-1233.
80. Aguado-Santacruz, G.A., Rascón-Cruz, Q., Cabrera-Ponce, J.L., Martínez-Hernández, A., Olalde-Portugal, V., and Herrera-Estrella, L. (2002). Transgenic plants of blue grama grass, *Bouteloua gracilis* (H.B.K.) Lag. ex Steud., from microprojectile bombardment of highly chlorophyllous embryogenic cells. *Theor Appl Genet* 104: 763-771.
81. López-Bucio, J., Hernández-Abreu, E., Sánchez-Calderón, L., Nieto-Jacobo, M.F., Simpson, J., and Herrera-Estrella, L. (2002). Phosphate availability alters architecture and causes changes in hormone sensitivity in the *Arabidopsis* root system. *Plant Physiology* 129: 244-256.
82. Marsch-Martinez, N., Greco, R., Van Arkel, G., Herrera-Estrella, L. and Pereira, A. (2002). Activation tagging using the *En-1* maize transposon system in *Arabidopsis*. *Plant Physiology* 129: 1544-1556.
83. O'connor Sánchez, A., Cabrera-Ponce, J.L., Váldez-Melara, M., Téllez-Rodríguez, P., Pons-Hernández, J.L., and Herrera-Estrella, L. (2002) Transgenic maize plants from tropical and subtropical genotypes obtained from calli containing organogenic and embryogenic-like structures derived from shoot tips. *Plant Cell Reports* 21: 302-312.
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