

CURRICULUM VITAE

Roberto A. Gaxiola Ariza

Birthday: October 20, 1957
Birthplace: Mexico City. Mexico
Nationality: Mexican
Marital Status: Single

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STUDIES

- 1978-1982 Bachelor in Science with Major in Biochemical Engineering at the Instituto Tecnológico y de Estudios Superiores de Monterrey. Unidad Guaymas. Guaymas Son, Mexico.
- 1983-1987 Master in Science
“*Saccharomyces cerevisiae* as an eucariotic model for the study of the molecular mechanisms that allow life in hypersaline environments”.
Supervisor: Dr. Samuel Zinker
Department of Genetics and Molecular Biology
Centro de Investigacion y de Estudios Avanzados. I.P.N.
Mexico City.
Fellowship: CONACyT, Mexico.
- 1988-1991 Ph.D. (Ruprecht-Karls University of Heidelberg)
“Isolation and characterization of genes of the yeast *Saccharomyces cerevisiae* involved in salt tolerance mechanisms”.
Examiners: Prof. Dr. Kai Simons, Prof. Dr. Thomas Graf, Prof. Dr. Mark Stitt, and Prof. Dr. Wieland Huttner.
Supervisor: Prof. Dr. Ramon Serrano. Group leader at the European Molecular Biology Laboratory (EMBL).Heidelberg, Germany.

Fellowship: **Deutscher Akademischer Austauschdienst (DAAD) and EMBL fellowship.**

PROFESSIONAL EXPERIENCE

- 1992-1993 Postdoctoral fellow
Genes that enhance halotolerance in yeast and plants.
Project leader: Prof. Dr. Ramon Serrano
Department of Biotechnology. University of Valencia.
Camino de Vera 14. 46022 Valencia, Spain.
**Fellowship: Ministerio de Educacion y Ciencia
Madrid, Spain.**
- 1993-1995 Associated Researcher "C"
Leader of the research project: A functional approach to salt tolerance. **Granted by CONACyT and European Commission (International Scientific Cooperation).**
Plant Molecular Biology Department. Instituto de Biotecnologia, UNAM Cuernavaca Morelos, Mexico.
- 1995-1999 Visiting Scientist in the laboratory of Dr. Gerald R. Fink at the Whitehead Institute for Biomedical Research (MIT).
Fellowship: Pew Latin American Fellows Program
- 2000 - Assistant Professor, Plant Molecular Genetics
Department of Plant Science, University of Connecticut.

COURSES TAUGHT

Introduction to Plant Science
Current Topics in Plant Biology
Plant Micropropagation
Invited guest lecturer for the Plant Biotechnology course

PUBLICATIONS

Gaxiola, R., de Larrinoa, I. F., Villalba, J. M., and Serrano, R. (1992). A novel and conserved salt-induced protein is an important determinant of salt tolerance in yeast. *Embo J* 11, 3157-64.

Glaser, H. U., Thomas, D., **Gaxiola, R.**, Montrichard, F., Surdin-Kerjan, Y., and Serrano, R. (1993). Salt tolerance and methionine biosynthesis in *Saccharomyces cerevisiae* involve a putative phosphatase gene. *Embo J* 12, 3105-10.

Serrano, R., & **R. Gaxiola**. (1994). Microbial models and salt stress tolerance in plants. *CRC Critical Reviews in Plant Sciences* 13, 121-138.

J.O. Mascorro-Gallardo, A.A. Covarrubias and **R. Gaxiola** "Construction of a CUP1 promoter-based vector to modulate gene expression in *Saccharomyces cerevisiae*. (1996) *GENE* 172, 169-170

Roberto Gaxiola, Matilde Corona and Samuel Zinker " A Halotolerant Mutant of *Saccharomyces cerevisiae* (1996) *Journal of Bacteriology*. Vol.178, No. 10. pp 2978-2981.

Roberto Gaxiola, Daniel Yuan, Richard Klausner and Gerald R. Fink. The Yeast CLC Chloride Channel Functions in Cation Homeostasis (1998) *Proc. Natl. Acad. Sci.* Vol 95. pp4046-4050.

Christian Luschnig, **Roberto Gaxiola**, Paula Grisafi and Gerald R. Fink. EIR1, A Root Specific Protein Involved in Auxin Transport, is Required for Gravitropism in *Arabidopsis thaliana*. (1998) *Genes and Development* Vol 12 No.14 pp 2175-2187.

Roberto A. Gaxiola, Rajini Rao, Amir Sherman, Paula Grisafi, Seth L. Alper and Gerald R. Fink. The *Arabidopsis thaliana* proton transporters, AtNhx1 and Avp1, can function in cation detoxification in yeast. (1999) *Proc. Natl. Acad. Sci.* Vol.96 pp 1480-1485.

Zentella R, Mascorro-Gallardo JO, Van Dijck P, Folch-Mallol J, Bonini B, Van Vaeck C, **Gaxiola R**, Covarrubias AA, Nieto-Sotelo J, Thevelein JM, Iturriaga G. A *Seraginella lepidophylla* Trehalose-6-Phosphate Synthase Complements Growth and Stress-Tolerance Defects in a Yeast *tps1* Mutant. (1999) *Plant Physiology* Vol 119(4) pp 1473-1482.

Andrew C. Diener, **Roberto A. Gaxiola**, and Gerald R. Fink. *Arabidopsis ALF5*, a Multidrug Efflux Transporter Gene Family Member, Confers Resistance to Toxins (2001) *The Plant Cell*, Vol. 13, pp1625-1637.

Roberto A. Gaxiola, Jisheng, Li, Soledad Undurraga, Lien M. Dang, Gethyn J. Allen, Seth L. Alper, and Gerald R. Fink. Drought- and Salt-Tolerant Plants Results from Overexpression of the AVP1 H⁺-Pump. (2001) *Proc. Natl. Acad. Sci* Vol.98 no.20 pp11444-11449.

Roberto A. Gaxiola, Gerald R. Fink, and Kendal D. Hirschi. Genetic Manipulation of Vacuolar Proton Pumps and Transporters. (2002) *Plant Physiology* Vol. 129 pp. 967-973.

R. Serrano, C. Montesinos, **R. Gaxiola**, G. Rios, J. Forment, M. Leube, J.M. Mullet, M.A. Naranjo, M. Roldan, O. Vicente, R.A. Kanhonou, A. Rausell and R. Ros. Functional Genomics of Salt Tolerance: the Yeast Overexpression Approach. (2003) *Acta Hort* Vol. 609 pp 31-38.

Richard W. Mercier, Natasha M. Rabinowitz, Rashid Ali, **Roberto A. Gaxiola**, Gerald A. Berkowitz Yeast hygromycin sensitivity as a functional assay of cyclic nucleotide gated cation channels. (2004) *Plant Physiology and Biochemistry* Vol. 42 pp 529-536.

Brini, F., **Gaxiola, R.A.**, Berkowitz, G.A., and Masmoudi, K. Cloning and characterization of wheat vacuolar cation/proton antiporter and pyrophosphatase proton pump (In press) *Plant Physiology and Biochemistry*.

MANUSCRIPTS SUBMITTED OR IN PREPARATION

1. **Gaxiola, R.** *et al.* Ectopic overexpression in tomato of the Arabidopsis AVP1 gene results in drought tolerance. (Submitted to Nature Biotechnology).

2. Jisheng Li,¹ Haibing Yang,¹ Gregory Richter,² Joshua Blakeslee,³ Anindita Bandyopadhyay,³ Wendy Ann Peer³, Boosaree Titapiwantakun³, Soledad Undurraga,¹ Angus Murphy³, Simon Gilroy,² **Roberto Gaxiola**^{1*} The H⁺-PPase AVP1 Is Required for Organ Development in Arabidopsis (manuscript in preparation).

3. Yang, H., Knap Jane & **Gaxiola, R.** Overexpression of the H⁺-PPase AVP1 Enhances Phosphate Uptake in Arabidopsis. (manuscript in preparation).

4. Undurraga, S., Yang, H., Li, J. & **Gaxiola, R.** The plasma membrane Na⁺/H⁺ antiporter *SOS1* is involved in high-affinity K⁺ uptake. (Manuscript in preparation).

PATENTS

"Root Specific Protein Involved in Auxin Transport", by Christian Luschnig, **Roberto A. Gaxiola**, Paula Grisafi and Gerald R. Fink. U.S. Application No.: 09/325,525.

"Drought/freeze resistant transgenic plants". Provisional#60/226,233 filed on 08/18/00. Inventor: **Roberto Gaxiola**

"Stress-resistant oversized transgenic plants capable of growing in salinized soil". PCT/US00/30955 filed on 11/10/00. Inventor **Roberto Gaxiola**

"Enhanced Meristematic Activity by Overexpression of a Tonoplast Pyrophosphatase". PCT/US01/09548 filed on 03/24/01. Inventor: **Roberto Gaxiola**

"Methods for Imparting Desirable Phenotypic Traits, Including Drought, Freeze and High Salt Tolerance and methods for Increasing Seed Production". PCT/US01/41806 filed on 08/20/01. Inventor: **Roberto Gaxiola**

CURRENT AND PENDING SUPPORT

Engineering salt and drought tolerant plants.
Plant Responses to the Environment program CSREES USDA
University of Connecticut
Direct Cost \$145,000 Sept 15th 2001- Aug 30th 2005.
Current

Evaluation of Salt and Drought Tolerant Phenotypes in Transgenic Arabidopsis and Tomato Plants
USDA HATCH
University of Connecticut
Direct Cost \$18,557 Oct. 1st 2001 – Sept. 30th 2004

Dissecting the role of the vacuolar H⁺-PPase in plant growth and K⁺ homeostasis
NSF Integrative Plant Biology
University of Connecticut
Direct Cost \$508,914 Sept. 1st 2004 - Aug 30th 2007
Pending

Overexpression of the H⁺-PPase AVP1 as a strategy to improve plant growth under limiting phosphate conditions
Plant and Environmental Adaptation
USDA
University of Connecticut
Direct Cost \$369,194 Sept. 1st 2005 – Aug 30th 2008
Pending