

CURRICULUM VITAE

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Assistant Professor
Researcher CIUNT

**National University of Tucumán
Faculty of Agronomy and
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HIGHER EDUCATION

- Postdoctoral Fellowship at the University of Puebla, Mexico. Center of Research in Microbiological Science, Institute of Science. To pursue biochemical analysis of the indole-3-acetic acid synthesis by *Azospirillum brasilense* under the supervision of Dr. Beatriz E. Baca. 2003.
- Doctor in Agronomy. National University of Tucumán, Argentina.
Title of Thesis: "Characterization of *Azospirillum* spp. and their relation with the different hydric conditions in the sugarcane area of Tucumán"
- Agriculture Engineer. National University of Tucumán, Argentina.

CURRENT RESEARCH INTEREST

Plant-Microbe Interaction. Use of *Azospirillum* sp. as a model microorganism to study the mechanisms by which PGPB enhance plant growth. Role of indoles and siderophores production on plant growth and protection to abiotic and biotic stresses. Diversity of PGPB associated to strawberry and sugarcane crops. Use of PGPB as inoculants.

FELLOWSHIP AND STAYS

- FOMEC and BUAP fellowships to stay at Center of Research in Microbiological Science, Institute of Science, University of Puebla, Mexico. "Biochemical analysis of the indole-3-acetic acid synthesis by *Azospirillum brasilense*". January-July 2003.
- Laboratory of Genetics and Biochemistry. EMBRAPA Agrobiology. Seropédica, Rio de Janeiro, Brazil. Influence of the microbial diversity on grain yield in different rice genotypes cultivated in Latin American countries. CNPq-PROSUL project. September-October 2007.
- Laboratory of Genetics and Biochemistry. EMBRAPA Agrobiology. Seropédica, Rio de Janeiro, Brazil. Influence of the microbial diversity on grain yield in different rice genotypes cultivated in Latin American countries. CNPq-PROSUL project. June-July 2008.

RESEARCH FUNDING PROJECTS AS DIRECTOR

- "Study of the plant growth promoting activity exerted by *Azospirillum* associated to sugarcane and strawberry plants" Granted by Research Council of the National University of Tucumán (CIUNT). 2005-2007.
- "Study of the defence response against anthracnose in strawberry (*Fragaria x ananassa*) as affected by the interaction with *Azospirillum*". Granted by Agencia Nacional de Promoción Científica y Tecnológica - Universidad Nacional de Tucumán. PICTO-UNT (BID 1728/OC AR-PICTO N° 860). 2006-2009.
- Co-Director of the node "Macro and microelements determination in beneficial microbial interactions with plant of agronomic importance" included in the Project PME 2006 "Strengthening of national core competencies from an integrated laboratory of transmission and scanning electron microscopy". Granted by Agencia Nacional de Promoción Científica y Tecnológica (2008).
- "Study of the diversity and plant growth promoting activity exerted by *Azospirillum* and others diazotrophs associated to strawberry plants" Granted by Research Council of the National University of Tucumán (CIUNT). 2008-2011.
- "Study of the growth promoting effect and defence response against pathogenic fungi exerted by *Azospirillum* in strawberry plants (*Fragaria ananassa* Duch.). Granted by Agencia Nacional de Promoción Científica y Tecnológica. PICT-2007. 2009-2012.
- FAZ-UNT Coordinator for the project "The diversity of beneficial microorganisms as an alternative for plant growth promotion and sustainability of soil quality in ibero-american countries". Granted by Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo (CYTED). UNESCO Code: 2414.99. Period 2009-2012.

PARTICIPATION IN RESEARCH PROJECTS RECEIVING GRANTS

- "Influence of the microbial diversity on grain yield in different rice genotypes cultivated in Latin American countries" EMBRAPA Agrobiología, Seropédica, Rio de Janeiro, Brazil. Project PROSUL/Edital CNPq N° 40/2005
- "Microbial systems management to improve the agricultural and silvopastoril production in some areas in northwestern Argentina". Code 26 A-201. Granted by CIUNT. 2001 - 2003.
- "Microbial systems management to improve the agricultural and silvopastoril production in some areas in northwestern Argentina". Code 26 A-102. Granted by CIUNT. 1998 - 2000.
- "Increment of production in the main crops of northwestern Argentina by using biofertilizers". Granted by CIUNT. 1995-1998.
- "Inoculation with ectomycorrhiza in forest nurseries of the province of Tucumán". PIA 3/97. FAZ-UNT, INTA and Secretary of Agriculture of the province of Tucumán. 1998-2002.
- "Influence of conservation production systems on the microflora, pests and diseases of grain crops in northwestern Argentina". Granted by INTA, Regional Tucumán-Santiago del Estero. Period 1994-1997.

RESEARCH PRODUCTION

a) Chapters in books.

- Pedraza, Raúl O. (2006). Fundamentos de biología molecular microbiana y regulación genética. En: Secreción Microbiana y Patogenicidad en Plantas – Aspectos Moleculares. Silvia Carrizo de Bellone y Carlos Hugo Bellone (Eds.). Universidad Nacional de Tucumán, FAZ Publicaciones, ISBN 950-554-518-5. pp. 31-53.
- Pedraza, R.O. and Díaz Ricci, J.C. (2004). Obtaining simple DNA from *Azospirillum*, suitable for RAPD analysis. In: Environmental Microbiology, Methods and Protocols. Spencer, J.F.T. and Ragout de Spencer, A.L. (Eds.). Humana Press, N.J., USA. 15: 151-157.
- Bellone, C.H., Bellone, S.C. de, and Pedraza, R.O. (1995). "Chitinase Expression in Strawberry Root Colonized by *Azospirillum brasilense* and V.A. Mycorrhiza", In: *Azospirillum* VI and Related Microorganisms, I. Fendrik, M. del Gallo, J. Vanderleyden and M. de Zamaroczy (Eds.). Springer-Verlag, Berlin Heidelberg. ISBN 3-540-60107-4. pp. 161-165.
- Jaime, M., Bellone, C., Pedraza, R., Bellone, S. C. de and Mulet, A. (1994). "Techniques of isolation of *Frankia* spp. in growth culture for *Rhizobium*". In: Nitrogen Fixation with Non-Legumes, N.A. Hegazi, M. Fayez and M. Monib (Eds.), Faculty of Agriculture, Cairo University, Giza, Egypt. ISBN 977 424 355 2. pp. 221-223.

b) Journal articles

- Raúl O. Pedraza, Jessica Motok, Sergio M. Salazar, Alicia L. Ragout, María I. Mentel, María L. Tortora, María F. Guerrero-Molina, Beatriz C. Winik, Juan C.

Díaz-Ricci. (2009). Growth-promotion of strawberry plants inoculated with *Azospirillum brasilense*. World Journal of Microbiology and Biotechnology. Springer. DOI: 10.1007/s11274-009-0169-1.

- Pedraza, R.O.; Bellone, C.H.; Bellone, S.C.; Boa Sorte, P.M.F.; Teixeira, K.R.S. (2009). *Azospirillum* inoculation and nitrogen fertilization effect on grain yield and on the diversity of endophytic bacteria in the phyllosphere of rice rainfed crop. European Journal of Soil Biology 45: 36-43.
- Pedraza, Raúl O. (2008). Recent advances in nitrogen-fixing acetic acid bacteria. International Journal of Food Microbiology 125: 25-35.
- Pedraza, R.O., Motok, J., Totorá, M.L., Salazar, S.M., and Díaz Ricci, J.C. (2007). Natural occurrence of *Azospirillum brasilense* in strawberry plants. Plant and Soil 295: 169-178.
- Pedraza, R.O.; Ramírez-Mata, A.; Xiqui, M.L.; and Baca, B.E. (2004). Aromatic amino acid aminotransferase activity and indole-3-acetic acid production by associative nitrogen-fixing bacteria. FEMS Microbiology Letters 233: 15-21.
- Pedraza, R.O. and Díaz Ricci, J.C. (2003). Genetic stability of *Azospirillum brasilense* after passing through the interior of sugarcane roots. Symbiosis 34: 69-83.
- Pedraza, R.O. and Díaz Ricci, J.C. (2002). In-well lysis technique reveals two new megaplasmids of 103.0 and 212.6 MDa in the multiple plasmid-containing strain V517 of *Escherichia coli*. Letters in Applied Microbiology 34(2): 130-133.
- Pedraza, R.O., Roncedo, S.C., Bellone, S.C. de, Bellone, C.H. y Pérez, H.E. (2001). Diferenciación de rizobios nativos que nodulan cuatro leguminosas forrajeras en Tucumán, Argentina. Ciencia del Suelo 19(1): 79-81.
- Ramallo, J., Pedraza, R.O. y Ploper, L.D. (2000). Reacción en cadena de la polimerasa (PCR): otra alternativa en el diagnóstico de fitopatógenos. Avance Agroindustrial 21(3): 25-28.
- Pedraza, R.O. y Díaz Ricci, J.C. (2000). *Azospirillum amazonense*: su presencia en el área cañera de la provincia de Tucumán. Revista Argentina de Microbiología 32: 199-201.
- Bellone, C.H., Bellone, S.C. de, Pedraza, R.O. and Monzon, A. (1997). "Cell colonization and infection thread formation in sugar cane roots by *Acetobacter diazotrophicus*". Soil Biology & Biochemistry 29(5/6): 965-967.
- Pedraza, R.O. y Bellone, C.H. (1996). "*Azospirillum* spp. in sugar cane roots". Comunicaciones Biológicas. 5(3): 275.
- Pedraza, R.O. and Bellone, C.H. (1993). "Mycorrhizas in Prickly Pear (*Opuntia ficus-indica* (L.) Miller). Comunicaciones Biológicas 2(3): 255.

c) Congress and workshop presentations (last 5 years)

- Pedraza, R.O.; Ramírez Mata, A.; Baca, B. E. (2004). Aromatic amino acid aminotransferase activity and indole-3-acetic acid production by associative nitrogen-fixing bacteria. ISME-10 Symposium. August 22-27, 2004, Cancún, Mexico.
- Pedraza, R.O.; Díaz Ricci, J.C.; and Bellone, C.H. (2004). Genetic Diversity of *Azospirillum brasilense* in the sugarcane cropping area of Tucuman, Argentina. XXII Reunión Latinoamericana de Rhizobiología. I Reunión Nacional de Fijación Biológica de Nitrógeno. Miguel Pereira, 13 al 15 de septiembre, Río de Janeiro, Brasil.

- Motok, Jessica, Pedraza, Raúl O. (2005). Isolation and characterization of *Azospirillum* from strawberry plants. IV Reunión de Producción Vegetal y II de Producción Animal del NOA. April, 28-29, 2005. S.M. de Tucumán.
- Pedraza, R.O., Baca, B.E. (2005). Detection of aromatic aminotransferase activity in different strains of *Azospirillum* after SDS-PAGE. V Reunión Nacional Científico Técnica de Biología del Suelo y V Encuentro sobre Fijación Biológica de Nitrógeno. July 6-8, 2005. San Salvador de Jujuy. Argentina.
- Motok, J., Salazar, S.M., Castagnaro, A.P., Díaz Ricci, J.C., Pedraza, R.O. (2006). Growth promotion of strawberry plants exerted by different strains of *Azospirillum brasilense*. BIOLATINA 2006, VII Feria Congreso Latinoamericano de Biotecnología, III Congreso Argentino de Biotecnología. 28, 29 y 30 de agosto. Buenos Aires.
- Pedraza, Raúl O., Motok, Jessica, Salazar, Sergio M., Díaz Ricci, Juan C. (2006). Natural occurrence of *Azospirillum brasilense* in strawberry plants cultivated in Tucumán. XX Congreso Argentino de la Ciencia del Suelo y I Reunión de Suelos de la Región Andina. September 19-22, 2006. Salta. Argentina.
- Salazar, S.M., Tortora, M.L., Díaz Ricci, J.C., Kirschbaum, D.S., Pedraza, R.O. (2007). Use of *Azospirillum brasilense* as biofertilizer in commercial strawberry fields. XXIII Reunión Latinoamericana de Rizobiología. March 25-29, 2007. Los Cocos, Córdoba, Argentina.
- Tortora, M.L., Salazar, S.M., Mentel, M.I., Guerrero Molina, M.F., Ragout, A.L., Pedraza, R.O. (2007). Plant growth promoting effect on strawberry plants inoculated with *Azospirillum brasilense*. XXIII Reunión Latinoamericana de Rizobiología. March 25-29, 2007. Los Cocos, Córdoba, Argentina.
- Tortora, M.L., Salazar, S.M., Díaz Ricci, J.C., Guerrero Molina, M.F., Bellone, C.H., Pedraza, R.O. (2007). Nitrogenase activity and siderophores production in *Azospirillum brasilense* strains isolated from strawberry plants. V Reunión de Producción Vegetal y III de Producción Animal del NOA. April 26-27, 2007. S.M. de Tucumán.
- Ragout, A.L., Mentel, M.I., Bru, E., Tortora, M.L., Siñeriz, F., Pedraza, R.O. (2007). Chemotaxis of *Azospirillum brasilense* toward strawberry root exudates. V Reunión de Producción Vegetal y III de Producción Animal del NOA. April 26-27, 2007. S.M. de Tucumán.
- Bellone, C.H., Villegas, J.A., Agüero, S., Carrizo de Bellone, S., Teixeira, K.R.dos S., Pedraza, R.O. (2007). *Azospirillum* inoculation and nitrogen fertilization in a rice rain-fed crop: vegetative evaluation. V Reunión de Producción Vegetal y III de Producción Animal del NOA. April 26-27, 2007. S.M. de Tucumán.
- Pedraza R.O., Tortora M.L., Salazar S.M., Ragout A.L., Mentel M.I., Guerrero Molina M.F., Winik B.C, Castagnaro A.P., Díaz Ricci J.C. (2007). Isolation, characterization and application of *Azospirillum* in strawberry plants cultivated under environmental controlled conditions and at field. VI Encuentro Latinoamericano y del Caribe de Biotecnología Agropecuaria. Viña del Mar, Chile, October 22-26, 2007.
- Tortora M.L., Salazar S.M., Díaz Ricci J.C., Pedraza R.O. (2007). Siderophores production by *Azospirillum brasilense* and *in vitro* growth inhibition of *Colletotrichum acutatum*. VI Enc. Latinoam. y del Caribe de Biotecnología Agropecuaria. Viña del Mar, Chile, October 22-26, 2007.
- Banegas, N., Albanesi, A., Pedraza, R., Nasca, J. y Toranzos, M. (2007). Determination of soil carbon fractions of a cattle grazing system in the depressed

saline plain, Argentina. XX reunión de la Asociación Latinoamericana de Producción Animal. October 21-25, 2007. Cuzco. Perú.

- Banegas, N.R.; Albanesi, A.S.; Toranzos M.R. y Pedraza R.O. (2008). Indicators of soil quality in a livestock system with tropical pastures. XXI Congreso Argentino de la Ciencia de Suelo. May 13-16, 2008. Potrero de los Funes. San Luis. Argentina.

- Banegas, N.R.; Albanesi; A.S.; Nasca, J.A.; Pedraza, R.O. y Toranzos, M.R. (2009). Evaluation of C types in wintering cattle pastoral system in the depressed saline plain of Tucumán. 1° Congreso Nacional Sistemas Silvopastoriles. May 14-16, 2009. Posadas. Misiones. Argentina.

- Tortora M.L., Díaz Ricci J.C., Pedraza R.O. (2009). Utilization of *Azospirillum brasilense* for the biocontrol of anthracnose in strawberry (*Fragaria ananassa*). VI Reunión de Producción Vegetal y IV de Producción Animal del NOA. April 23-24, 2009, S.M. de Tucumán. Argentina.

- Banegas, N., Albanesi, A., Nasca, J., Pedraza, R. y Toranzos, M. (2009). Labile fraction of organic matter and microbial activity in a pastoral cattle system of the depressed saline plain of Tucumán. VII Reunión Nacional Científico-Técnica de Biología del Suelo y Fijación Biológica del Nitrógeno Atmosférico. July 1-3, 2009. San Miguel de Tucumán. Argentina.

- Guerrero Molina, M.F.; Tortora, M.L.; Teixeira, K.R.S.; Díaz Ricci, J.C.; Pedraza, R.O. (2009). Study of the endophytic colonization of *Azospirillum brasilense* in roots of strawberry plants (*Fragaria ananassa*). VII Reunión Nacional Científico-Técnica de Biología del Suelo y Fijación Biológica del Nitrógeno Atmosférico. July 1-3, 2009. San Miguel de Tucumán. Argentina.

- Mentel M.I., Ragout A.L., Bru E., Pedraza R.O. (2009). Chemotaxis of *Azospirillum brasilense* toward strawberry root exudates assessed by plate and capillary methods. VII Reunión Nacional Científico-Técnica de Biología del Suelo y Fijación Biológica del Nitrógeno Atmosférico. July 1-3, 2009. San Miguel de Tucumán. Argentina.

- Guerrero Molina M.F., Winik B.C., Pedraza R.O. (2009). Colonization of strawberry (*Fragaria ananassa*) plant tissues by *Azospirillum brasilense*. 10th Inter-American Congress of Electron Microscopy. October 25-28, 2009. Rosario, Argentina.

FORMATION OF HUMAN RESOURCES (Last 5 years)

a) Postgraduate:

- Director of Doctoral Thesis: "Quantification of carbon captured by *Chloris gayana* cv Finecut under a silvopastoral system in the saline plain of Tucumán and of the native vegetation replaced". National University of Tucumán. Eng. Natalia R. Banegas. (Under development).
- Director of Doctoral Thesis: "Study of the defence response against anthracnose in strawberry plants (*Fragaria x ananassa*) mediated by the interaction with *Azospirillum*". National University of Tucumán. Biotech. María L. Tortora. (Under development).
- Co-Director of Magister Scientiae Thesis: "Use of molecular markers to identify genes resistant to *Melampsora lini* in different genotypes of *Linum usitatissimum* L.". Eng. Esteban T. Muñiz-Padilla. (Under development).

b) Undergraduate:

- Graduate Thesis: "Study of the plant growth promoting activity exerted by *Azospirillum* in strawberry plants". Jessica Motok. Biotechnology. National University of Tucumán. 2006.
- Graduate Thesis: "Chemotaxis of *Azospirillum brasilense* toward root exudates of strawberry plants". María I. Mentel. Biotechnology. National University of Tucumán. 2009.
- Graduate Thesis: "Ultrastructural study of *Azospirillum brasilense* colonizing strawberry plants". María F. Guerrero-Molina. Biotechnology. National University of Tucumán. 2009.

POSTGRADUATE COURSES TAUGHT

- Invited Participant Professor: "Biology of the rhizosphere". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 100 h. June 2-31, 1998. Code 99.
- Invited Participant Professor: "Nitrogen-fixing microorganisms in the rhizosphere". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 100 h. August 2-31, 2001. Res. N° 603-01.
- Invited Participant Professor: "Soil Ecology". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 60 h.. Master of Agricultural Sciences, Plant Production orientation. Code N° 26019894. June 17-28, 2002.
- Invited Participant Professor: "Bioinformatics". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 40 h.. Master of Agricultural Sciences, Sustainable Production orientation. Code N° 26019876. March 29-April 2, 2004.
- Invited Participant Professor: "Soil Ecology". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 60 h.. Master of Agricultural Sciences, Plant Production orientation. Code N° 26019879. June 8-18, 2004.
- Invited Participant Professor: "Soil Ecology". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 60 h.. Master of Agricultural Sciences, Plant Production orientation. Code N° 26019879. May 9-18, 2007.
- Invited Participant Professor: "Application of biomolecular techniques in the study of plant-microbe interactions". National University of Río Cuarto, Córdoba, Argentina. October 6-10, 2008.
- "Diversity of beneficial microorganisms in the plant growth-promotion and soil quality". Faculty of Agronomy and Zootechnics, National University of Tucumán. Duration: 50 h. June 24-30, 2009.

INVITED LECTURES AT CONFERENCES OR MEETINGS

- "Inoculation of strawberry plants with *Azospirillum*". Seminary of Technological Advances in Strawberry. INTA-Famaillá, Lules, Tucumán, Argentina. October 18, 1996.

- "Characterization of *Azospirillum* spp. and its relation with the different hydric conditions in the sugar cane area of Tucumán". Practical course in molecular biology of microorganisms. Laboratory of Biochemistry and Physiology of Microorganisms. Federal University of Ouro Preto, Minas Gerais, Brasil. November 30-December 19, 1997.
- "Nitrogen fixing acetobacteria". International Symposium on Vinegars and Acetic Acid Bacteria. May 8-12, 2005, Reggio Emilia, Italy.
- "Studies on *Azospirillum* associated to strawberry plants (*Fragaria ananassa* Duch): isolation, characterization and inoculation trials". EMBRAPA Agrobiología, Río de Janeiro, Brasil. Septiembre 24, 2007.

Further scientific contributions

- Referee for international journals:
 - World Journal of Microbiology and Biotechnology. Springer.
 - Biotechnology and Bioengineering. John Wiley & Sons, Inc.
 - International Journal of Food Microbiology. Elsevier.
 - Process Biochemistry. Elsevier.
 - Medical Science Monitor. International Scientific Literature, Inc.
- Referee for grants:
 - External Evaluator of research projects from National Institute of Agricultural Technology (INTA).
 - Member of the Bank of External Evaluators of the National Council of Science and Technology (CONICET), area of Agrarian Sciences.
- Committee member for PhD theses: four times.
- Assitant Researcher at Estación Experimental Agroindustrial Obispo Colombres (EEAOC). Laboratory of Biotechnology. February-September 2009.
- Member of the Academic Committee. Magister in Agricultural Sciences. Faculty of Agronomy and Zootechnics. National University of Tucumán. 2009.

October 2009