

Dr. Laila Pamela Partida Martínez

Education and Awards

- 11.03-08.07 Leibniz Institute for Natural Product Research and Infection Biology - Hans-Knoell-Institute, Biomolecular Chemistry Department (Prof. C. Hertweck) and the Friedrich Schiller University (Jena, Germany)
Dr. rer. nat. in Natural Products Chemistry
- Graduated with distinction (magna cum laude).
- Awarded the VAAM Ph.D. Prize 2008 from the Society of General and Applied Microbiology.
- Awarded the DECHEMA Ph.D. Prize 2008 for Natural Products Research given by the German Society for Chemical Engineering and Biotechnology.
- Awarded the Thuringian Research Prize 2005 for Fundamental Research.
- 10.01-12.02 University of Birmingham (Birmingham, UK)
M. Sc. Biochemical Engineering
- Graduated with distinction.
- Awarded John Brown Prize for Biochemical Engineering.
- Awarded CONACyT's scholarship for postgraduate studies.
- 08.93-12.97 Instituto Tecnológico y de Estudios Superiores de Monterrey (Monterrey, Mexico)
B. Sc. Chemical Engineering and Management
- Graduated with excellence honours.
- Earned special award for the highest marks in my major delivered by the president of Mexico, Dr. Ernesto Zedillo Ponce de León.
- Awarded first place at the Seventh Entrepreneur Gathering for the final project Interce.
- Awarded the Scholarship of Excellence for Bachelor studies after graduating first in my High School class (ITESM, May 1993).

Professional Experience

- 08.10- to date **Centro de Investigaciones y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV) Unidad Irapuato**, Genetic Engineering Department (Irapuato, Mexico)
- Researcher 3-A
- Head of the Laboratory of Microbial Interactions
- 08.08- 07.10 **Instituto Tecnológico y de Estudios Superiores de Monterrey**, Department of Biotechnology and Food Engineering (Monterrey, Mexico)
- Assistant Professor and Scientific Researcher
- Earned in 2009 a Repatriation Grant from CONACyT.
- Since 2010 member of the Mexican National Researchers System- **SNI Level 1**.
- 11.03-07.08 **Leibniz Institute for Natural Product Research and Infection Biology - Hans-Knoell-Institute**, Biomolecular Chemistry Department (Jena, Germany)
- Ph.D Student and since 02.07 Postdoc.
- Ph.D. Dissertation: "Discovery of endofungal bacteria: new insights into toxin biosynthesis and bacterial-fungal symbiosis".
- 02.02-12.02 **University of Birmingham**, Biochemical Recovery Group (Birmingham, UK)
- Master Dissertation: "Preparation and Evaluation of Novel Adsorbent Solid Phases for the Fluidised Bed Recovery of Protein Products from Particulate Feedstocks".

Professional Experience

- 01.98-07.01 **Andersen Business Consulting**, (Mexico City, Mexico)
- Senior Business Consultant.
 - Worked as project leader with both client and internal teams in international and national projects related mainly to the following areas:
 - Software selection and Enterprise Resource Planning (ERP) software implementation, encompassing the functional design, configuration and system implementation, report development, end-user training and interfaces functional design.
 - * Pioneer Industrial Components (USA and Mexico)
 - * HBO Latin American Group (Brazil and Venezuela)
 - * Arthur Andersen, OSRAM, DHL International, El Cid Resorts and Office Max (Mexico)
 - Process reengineering and optimisation, including the definition of key performance indicators, implementation of redesigned processes, and the quantitative analysis of savings.
 - * ITESM Virtual University (Mexico)
 - * Sorteo Tec (Mexico)
 - Strategy definition and organisational design, involving the identification of previous organisational scheme, processes and underlying strategy and the development of a three-years workplan for the implementation of the new proposed strategy.
 - * IMSS. The National Institute of Social Security (Mexico)
 - * AHMSA. The major steel manufacturer in Mexico (Mexico)
 - International commerce, including the development of market studies and the selection of potential business partners for bilateral cooperation.
 - * ICEX. The Spanish Institute for International Commerce (Spain and Mexico).
 - In general, responsible of the project management, of developing staff under my supervision, managing a positive relationship with the client and delivering outstanding results.
- 08.97-12.97 **ITESM Campus Monterrey**, (Monterrey, Mexico)
- Thesis in formic acid production.
 - Developed the design, planning and evaluation of a formic acid plant with focus on the hydrolysis reactors design, the automation control strategy and the economic evaluation of the overall project.
- 05.97-08.97 **Prolec-General Electric**, (Apodaca, Mexico)
- Intern in charge of the cost reduction project in the packing of power transformers.
 - Developed the analysis and design of the standardised package of power transformers. The standardised package and the new packing process directly led to cost savings of one million dollars per year.

Publications

1. Lackner G, Moebius N, **Partida-Martinez LP**, Boland S, Hertweck C. Evolution of an endofungal Lifestyle: Deductions from the *Burkholderia rhizoxinica* Genome. *BMC Genomics*. **2011** 12, 210. doi.10.1186/1471-2164-12-210 (IF₂₀₁₀= 4.206, Times cited _{07.11}: 0)
2. Lackner G, Moebius N, **Partida-Martinez L**, Hertweck C. Complete Genome Sequence of *Burkholderia rhizoxinica*, the Endosymbiont of *Rhizopus microsporus*. *J Bacteriol*. **2011** 193(3), 783-4. (IF₂₀₁₀= 3.726, Times cited _{07.11}: 3)
3. Rohm B, Scherlach K, Moebius N, **Partida-Martinez LP**, Hertweck C. Toxin production by bacterial endosymbionts of a *Rhizopus microsporus* strain used for tempe/sufu processing. *Int J Food Microbiol*. **2010** 136(3), 368-71. (IF₂₀₁₀= 3.143, Times cited _{07.11}: 2)
4. Lackner G, **Partida-Martinez LP** y Hertweck C. Endofungal bacteria as producers of mycotoxins. *Trends Microbiol*. **2009** 17(12), 570-6. (IF₂₀₀₉= 6.894, Times cited _{07.11}: 9)
5. Lackner G, Möbius N, Scherlach K, **Partida-Martinez LP**, Winkler R, Schmitt I, Hertweck C. Global distribution and evolution of a toxinogenic *Burkholderia-Rhizopus* symbiosis. *Appl. Environ. Microbiol*. **2009** 75(9), 2982-2986. (IF₂₀₀₉= 3.686, Times cited _{07.11}: 13)
6. **Partida-Martinez, LP**. Mykotoxine aus bakteriellen Symbionten. *BIOspektrum*. **2008** 4, 433.
7. Jahanshahi M, **Partida-Martinez L**, Hajizadeh S. Preparation and evaluation of polymer-coated adsorbents for the expanded bed recovery of protein products from particulate feedstocks. *J Chromatogr A*. **2008** 1203(1), 13-20. (IF₂₀₀₈= 3.756, Times cited _{07.11}: 7)
8. Schmitt I, **Partida-Martinez LP**, Winkler R, Voigt K, Einax E, Dölz F, Telle S, Wöstemeyer J, Hertweck C. Evolution of host resistance in a toxin-producing bacterial-fungal alliance. *ISME J*. **2008** 2(6), 632-41. (IF₂₀₀₈= 5.029, Times cited _{07.11}: 18)
9. **Partida-Martinez LP**, Bandemer S, Rüchel R, Dannaoui E, Hertweck C. Lack of evidence of endosymbiotic toxin-producing bacteria in clinical *Rhizopus* isolates. *Mycoses* **2008** 51(3), 266-269. (IF₂₀₀₈= 1.529, Times cited _{07.11}: 8)
10. **Partida-Martinez LP**, Groth I, Schmitt I, Richter W, Roth M, Hertweck C. *Burkholderia rhizoxinica* sp. nov. y *Burkholderia endofungorum* sp. nov., bacterial endosymbionts of the plant pathogenic fungus *Rhizopus microsporus*. *Int. J. Syst. Evol. Microbiol*. **2007** 57(Pt 11), 2583-2590. (IF₂₀₀₇ = 2.384, Times cited _{07.11}: 23)
11. Brendel N, **Partida-Martinez LP**, Scherlach K, Hertweck C. A cryptic PKS/NRPS gene locus in the plant commensal *Pseudomonas fluorescens* Pf-5 codes for the biosynthesis of an antimitotic rhizoxin complex. *Org. Biomol. Chem*. **2007** 5(14), 2211-2213. (IF₂₀₀₇= 3.167, Times cited _{07.11}: 23)
12. **Partida-Martinez LP**, Monajembashi S, Greulich KO, Hertweck C. Maintenance of a bacterial-fungal mutualism through endosymbiont-dependent host reproduction. *Curr. Biol*. **2007** 17(9), 773-777. (IF₂₀₀₇= 10.539, Times cited _{07.11}: 40)
13. **Partida-Martinez LP**, de Looß CF, Ishida K, Ishida M, Roth M, Buder K, Hertweck C. Rhizonin, the first mycotoxin isolated from Zygomycota, is not a fungal metabolite, but produced by bacterial endosymbionts. *Appl. Environ. Microbiol*. **2007** 73(3), 793-797. (IF₂₀₀₇= 4.004, Times cited _{07.11}: 32)
14. **Partida-Martinez LP** and Hertweck C. A gene cluster encoding rhizoxin biosynthesis in *Burkholderia rhizoxina*, the bacterial endosymbiont of the fungus *Rhizopus microsporus*. *Chembiochem*. **2007** 8(1), 41-45. (IF₂₀₀₇= 3.446, Times cited _{07.11}: 53)
15. Scherlach K, **Partida-Martinez LP**, Dahse HM, Hertweck C. Antimitotic rhizoxin derivatives from a cultured bacterial endosymbiont of the rice pathogenic fungus *Rhizopus microsporus*. *J. Am. Chem.*

Soc. **2006** 128(35), 11529-11536. (IF₂₀₀₆= 7.696, Times cited _{07.11}: 45)

16. **Partida-Martinez LP** and Hertweck C. Pathogenic fungus harbours endosymbiotic bacteria for toxin production. *Nature*. **2005** 437(7060), 884-888. (IF₂₀₀₅= 29.273, Times cited _{07.11}: 116)

Patents

1. European Patent Nr.1888740 (PCT/DE2006/000962). Hertweck C and **Partida-Martinez LP**. *Burkholderia rhizoxina* micro-organisms, novel endosymbionts of *Rhizopus* sp. and method for producing rhizoxin and/or rhizoxin derivatives using said micro-organisms.

2. European Patent Nr.1940848 (PCT/DE2006/001708). Scherlach K, **Partida-Martinez LP** and Hertweck C. Antimitotic rhizoxin derivatives of *Burkholderia rhizoxina*, method for producing said derivatives and use thereof.

Presentations in Symposia

As plenary lecturer

1. **Partida-Martinez LP**. Natural products: research and potential in the 21st. Century. 2nd. Regional Symposium and 1st. National Congress in Biotechnology and Sustainable Agricultural Production. CIIDIR IPN Mich y COECyT Mich. 18-20 August 2010. Jiquilpan, Mich., Mexico.

As invited speaker

1. **Partida-Martinez LP**. Fungal-bacterial symbiosis: implications in toxins biosynthesis and learnings from symbiont's genome. XIV National Congress of Biotechnology and Bioengineering. June 22nd 2011. Juriquilla, Qro., Mexico.

2. **Partida-Martinez LP**. Symbiosis: life with others. Contributions of Molecular Biology and Ecology to Arid Regions. UBIPRO, UNAM Iztacala. June 7th 2011. Mexico City, D.F., Mexico.

3. **Partida-Martinez LP**. Microorganisms and their interactions with higher organisms: importance, potential and case studies. 1st. Multidisciplinary Congress of Engineering. Technological Institute of Morelia. May 11th 2011. Morelia, Mich., Mexico.

4. **Partida-Martinez LP**. Natural products and the interactions among microbes. Academic and Cultural Week 2010. Queretaro's Autonomous University, Chemistry Faculty. 27th. October 2010. Queretaro, Qro., Mexico

5. **Partida-Martinez LP**. Mycotoxins from bacterial symbionts. Mexico Bio 09. 6th. International Research Gathering of Natural Products/1st. International Business Forum in Biotechnology. CINVESTAV, Langebio, Promexico and Guanajuato State. 21-23 October 2009. Irapuato, Gto., Mexico.

6. **Partida-Martinez LP**. Discovery of endofungal bacteria: new insights into toxin biosynthesis and bacterial-fungal symbiosis. VAAM-Annual Conference 2008. 9-11 March 2008. Frankfurt, Germany.

7. **Partida-Martinez LP**. Molekulare Basis einer pathogenen Pilz-Bakterien-Symbiose. HKI Instituts-Symposium. 19th. February 2007. Jena, Germany.

8. **Partida-Martinez LP** and Hertweck C. Bacterial Symbionts of Fungi. Pathogenic fungus harbours endosymbiotic bacteria for toxin production. Biological Interactions and Biological Crossroads. APS-CPS-MSA 2006. Joint Meeting. 29 July-2 August 2006. Quebec City, Canada.

9. **Partida-Martinez LP**, Scherlach K and Hertweck C. Biosynthesis of antimetabolic polyketides by bacterial endosymbionts of *Rhizopus microsporus*. VAAM-Annual Conference 2006. 19-22 March 2006. Jena, Germany.

10. **Partida-Martinez LP**, Scherlach K and Hertweck C. Pathogener Pilz beherbergt bakterielle

Endosymbionten zur Toxinproduktion. 5 min. Vortrag mit Poster-Präsentation. Aktuelle Entwicklung in der Naturstoff-Forschung. 18. Irseer Naturstofftage der DECHEMA e.V. 22-24 February 2006. Irsee by Kaufbeuren/Allgäu, Germany.

As accepted/registered speaker

1. **Partida-Martinez LP.** Pathogenic fungus harbours endosymbiotic bacteria for toxin production. 40° Congreso de Investigación y desarrollo. ITESM. Rectoría Zona Metropolitana de Monterrey. 20-22 January 2010. Monterrey, N.L., Mexico.

2. **Partida-Martinez LP.** Mycotoxins from bacterial symbionts. ITESM. 3er. Congreso Internacional de Investigación Científica Multidisciplinaria de la Rectoría Zona Norte. 15-16 October 2009. Saltillo, Coah., Mexico.

Teaching Experience

Postgraduate Courses *CINVESTAV-Irapuato*, Irapuato, Gto. for both M.Sc. and Ph.D. Students in Plant Biotechnology:

1. Genetic and Molecular Biology I,
2. Experimental Methods (including laboratory work).
3. Biochemistry – Introductory Course

Postgraduate Courses *ITESM Campus Monterrey*, Monterrey, N.L. for both M.Sc. and Ph.D. Students in Biotechnology at ITESM in Monterrey, Mexico:

1. Microbiology in Research (including laboratory work)
2. Bioseparations

Undergraduate Courses in the Major IBT (Engineering in Biotechnology) at ITESM in Monterrey, Mexico:

1. Enzymology and Biocatalysis (6th. Semester)
2. Biotechnological processes and bioseparations (8th Semester)
3. Project in Bioprocess Engineering (9th Semester).

Undergraduate Courses for students of Biology and Biochemistry at the Friedrich-Schiller University (FSU) in Jena, Germany:

1. Natural Products Chemistry Laboratory (4-6th Semester).

Supervised Students

Current Postgraduate Students at ITESM

M.Sc. Liliana Santos Zea, Ph.D. Student. Topic: MIMEX. Co-Advisor.

Ing. Claudia Aurora Espinosa Leal, M.Sc. Student. Topic: Microorganisms associated to Cacti and evaluation of their biochemical potential.

Memberships

Member of the VAAM (Society of General and Applied Microbiology based in Germany) since 2008.
Member of the Mexican Cactology Society since 2008.

Computer Skills

LyX, DNASTar, Microsoft Office, Aspen, GPSS, IMSL, Fortran, Qbasic, CC, Visio, Optima, Lotus Notes, PeopleSoft (GL, AP, CM, AM, nVision and Query).

Languages

Native speaker of Spanish, fluent in English and German.

Hobbies

Ballet and Contemporary Dance, Reading, Music, Arts in General and Outdoor Sports.

Research Interests – Laboratory of Microbial Interactions

The Laboratory of Microbial Interactions, under the direction of Dr. Laila Pamela Partida Martínez, started in August 2010 at the CINVESTAV – Irapuato and has as a major goal the study of microbes and their interactions with the environment. Microbes are critical for the global ecological balance and they are part of most, if not all, living organisms on Earth (even defining them!). The “omics” technics such as genomics, proteomics and metabolomics together with classical and well established biochemical and microbiological methods allow nowadays a better understanding of the complex networks and interactions microbes are involved. Such interactions have proved important and useful not only for the discovery of active biological products and novel species, but also for the understanding of their ecological role, their diversity and evolution.

Under this perspective, one of the main objectives of this Laboratory is the study of the microbes associated to plants, especially Cactus and Agaves due to their economical, cultural and ecological relevance.

The fundamental questions of this research area can be summarized in the following questions:

1. Which microbes are symbionts of these plants?
2. What makes the symbiosis work?
3. How has the symbiosis evolved and how this has modeled each partner?
4. Is plant diversity related to microbial diversity?

The answer to these questions, besides contributing to the scientific interest, could also lead to some applications such as:

- Plant improvement by microbial endophytes (growth promoters, biocontrol agents, etc.)
- Discovery and production of active biological compounds for application in medicine, agriculture and/or industry.

Additionally, we are interested in the **design and development of chromatographic materials** for the selective recovery of biotechnological products such as proteins and metabolites, and also in developing **separation techniques** that can improve the isolation and culturability of microbes.