**Juan Pedro Maestre Wic**

Post-Doctoral Researcher

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**STATEMENT:**

*Environmental sciences represent an inherently interdisciplinary area of knowledge. As a result, my education has included coursework in microbiology, environmental engineering, molecular biology, chemistry, and biological sciences. In the last three decades, not only has the field been created, but it also has been revolutionized by the great advances in molecular biology. More and more, the prevention of and solutions for environmental challenges require a thorough understanding of the underlying biochemical processes.*

*My primary areas of expertise are environmental microbiology and environmental engineering. My current research focuses on delineating the microbiome present in natural and engineered systems, with special emphasis on drinking water, wastewater, water reuse systems, indoor environments, and their associated air environments. Microorganisms are at the core of many environmental challenges, such as pollution prevention, pollution treatment, and resources recovery. Thus, it is crucial to understand the presence, activity, ecology, and diversity of microorganisms in an environmental engineering context.*

*I strongly believe that emerging molecular biology techniques, such as genomics, metagenomics, and metatranscriptomics, integrated with traditional and novel technologies in the environmental engineering field are fundamental to better understand the causes of environmental problems, and thus, to develop novel solutions.*

**SYNERGISTIC ACTIVITIES**

* Dr. Maestre has an interdisciplinary degree in environmental science and engineering from Spain as well as extensive laboratory and field experience. His background integrates microbiology, air pollution, and biological treatment processes.
* He has experience with multidisciplinary projects involving civil engineers, mycologists, environmental engineers, and biologists. He has supervised a M.S. student and collaborated with several engineers and scientists from various international research institutions.
* Dr. Maestre has used molecular biology tools such as cloning and sequencing, terminal restriction fragment length polymorphism (T-RFLP) and reverse transcription polymerase chain reaction (RTPCR), quantitative polymerase chain reaction (qPCR), and high-throughput sequencing to study community structure and function, the spatial distribution of the populations, and the dynamics of the community in biological systems. He strongly believes in the use of molecular biology techniques in addition to traditional engineering tools, which allow researchers to study the basis of biological processes and to improve the design and operation of engineered processes.
* Dr. Maestre collaborated as Postdoctoral fellow in CAEE in the DNA sequencing efforts for the "The Microbial Community of Retail Environments" study funded by the Sloan Foundation.
* Dr. Maestre has been collaborator on the NSF-funded effort to measure and characterize the bacteria and fungi aerosolized from residential showers and to investigate the sources of the microorganisms released.
* He is the postdoctoral fellow leading the microbial study in the HUD-funded project investigating the relationships between environmental contaminants and microbial communities in homes and the severity of asthma for rural children in Texas. Sixty homes in rural Texas are being investigated over two seasons.
* Dr. Maestre is co-lead on the “Mapping the UTBIOME” effort to engage the UT community in the collection and analysis of environmental and microbiome samples from across the campus, involving the outdoor environment (Waller Creek) and the indoor environment. Nearly 400 participants have been involved in the eight sampling events planned in the project.
* More broadly, he is also using conventional and novel methodologies to collect bioaerosol samples and molecular microbiology tools to characterize the fungal and bacterial communities that develop in indoor environments.
* He also supervised groups of workers during his experience as a project manager in solid waste management facilities. He routinely monitored sampling controls at the facilities, from the sampling event through the interpretation of the data. He also collaborated in the decision-taking processes in the facilities based on his knowledge of the processes and the sampling results. During his work with solid waste management facilities Dr. Maestre also gained experience managing large sampling efforts.

**EDUCATION AND CERTIFICATION**

**Ph.D. Environmental Sciences in the Department of Chemical Engineering at the Autonomous University of Barcelona (Spain), 2009.**

Advisors: Dr. David Gabriel Buguna

Dr. Xavier Gamisans Noguera

Dissertation title: ‘Characterization and Monitoring of Gas-Phase Bioreactors, Accessing the Black Box through Molecular Biology Tools’

1. **M.S. Environmental Sciences in the Department of Chemical Engineering at the Autonomous University of Barcelona (Spain), 2005.**

Advisors: Dr. David Gabriel Buguna

Dr. Xavier Gamisans Noguera

Thesis title: ‘Comparative study of Gas-Phase Bioreactors for High Loads of Toluene’

1. **B.S. Environmental Sciences, at the University of Córdoba (Spain), 2003.**

**PROFESSIONAL EXPERIENCE**

1. 03/11 – Present Post-Doctoral researcher; University of Texas at Austin
	1. Research in water and air quality, applying novel molecular biology tools (Next Generation Sequencing (pyrosequencing and Illumina Sequencing) and qPCR) to improve engineered biosystems. **(Austin, United States of America)**
2. 12/09 - 11/10 Project Manager; Tecnología Medio Ambiente Inc. Barcelona
	1. Monitoring and Control of waste facilities and their associated wastewater. **(Barcelona, Spain)**
3. 02/04 - 12/09 Graduate Researcher and Teaching Assistant; Autonomous University of Barcelona
	1. Characterization of bioreactors using molecular biology tools (fluorescence in situ hybridization (FISH), terminal restriction fragment length polymorphism (T-RFLP), amplified rDNA restriction analysis (ARDRA), reverse transcriptase PCR (RT-PCR), and cloning and Sanger sequencing) for the treatment of hydrogen sulfide, ammonia, and toluene. **(Barcelona, Spain)**

1. 11/03 - 02/04 Graduate Research Assistant; Autonomous University of Barcelona (Spain)
	1. Set up, operated and monitored two lab-scale gas-phase bioreactor systems for the treatment of gas phase pollutants. **(Barcelona, Spain)**
2. 07/03-09/03 Intern; water management company in Córdoba (EMACSA)
	1. Development of an Environmental Management System according to ISO14001. **(Córdoba, Spain)**
3. 07/02-09/02 Intern; Educational Center for the Sea
	1. Collaboration in a project to evaluate the water quality and recover threatened sealife, Málaga. **(Málaga, Spain)**
4. 07/01-09/01 Intern; Agricultural Research and Education Center (CIFA) Alameda del Obispo, Córdoba.
	1. Collaboration in a research project in Agricultural Development. **(Córdoba, Spain)**

**TEACHING EXPERIENCE**

* Lecture on Anaerobic Digestion in the course CE 364/CE 386M Water Treatment and Wastewater Treatment Plant Design. University of Texas at Austin.
* Chemical Engineering for Chemists. Fall 2007; 2008. Lab section. Autonomous University of Barcelona.
* Air Pollution Control. Spring 2006. Recitation section to solve practical problems related to the theory part of the course. Autonomous University of Barcelona.

**LANGUAGES**

* Proficient in Spanish, English and Catalan.
* Knowledge of French and Italian.

**SELECTED COURSES & CONTINUING EDUCATION**

* Attended the AAAS and the Citizen Science Conference in San Jose, CA, 10-17, February, 2015.
* Microbial Genomics & Metagenomics Workshop: 9/8/2014 - 9/12/2014 JGI, Walnut Creek, California.
* Audited ME 397 Teaching Practicum Fall 2014, taught by Dr. Borrego at The University of Texas at Austin.
* Attended workshop: ‘Sustainable Cities: Participation in RCN Sustainable cities: People and infrastructures at the water-energy-climate nexus’. Research Collaborative Network Workshop - Phoenix/Tempe, Arizona (ASU) 4.25-4.30.14
* Webinar course “Legionella Contamination: Contemporary Techniques for Detection and Remediation”
* Attended Gordon Research Conference on ‘Applied & Environmental Microbiology’ in Mount Holyoke College in South Hadley MA, July 2013.
* Course: 'Data Analysis with R'. Online course by the John Hopkins University. Jan-April 2013. Covering data analysis methodologies as a core component in Biostatistics by using R.
* Workshop on R graphics at The University of Texas. October 2012. Covered main features when creating graphics in R.
* Course: 'Strategies and Techniques for Analyzing Microbial Population Structures' at the Marine Biological Laboratory, Massachusetts, USA. Summer 2012.
* Attended SXSWedu 2012. The conference in education featured three days of compelling presentations from education professionals, industry leaders, and policy practitioners committed to innovations in learning. Austin March 5th-8th, 2012.
* Biostatistics course at The University of Texas at Austin. Fall Semester 2012.
* Power Analysis for Proposal Writing at UT Summer Statistics Institute. Summer 2012.
* Introduction to R at UT Summer Statistics Institute. Summer 2012.
* Italian Intermediate at The University of Texas at Austin. Summer 2012.
* Introduction to Italian, at The University of Texas at Austin. Summer 2011.

**professional development activities**

* Experimental chamber research training at the University of Leeds. May 5-13-2014. Seminar on May 9th on "Characterization of shower aerosols: Biological and physical considerations", and “Filter forensics: A novel method for exploring asthma triggers for children in low-income rural homes¨.
* CUSP WORKSHOP on “Micro-phylogeography of cities”, July 1-3, 2013, Brooklyn NYU-Poly
* AWWA professional meeting seminar on June 20th 2014. Tittle: "Characterization of shower aerosols", Austin, Texas.

**PEER-REVIEWED PUBLICATIONS**

1. Hoisington, A., **Maestre, J.P.**, Siegel, J.A., and Kinney, K.A. 2014. “Exploring the Microbiome of the Built Environment: A Primer on Four Biological Methods Available to Building Professionals,” HVAC&R Research, 20: 167-175.
2. Hoisington, A., **Maestre, J.P.**, Siegel, J.A., King, M., and Kinney, K.A. 2014. “The Impact of Sampler Selection on Characterizing the Indoor Microbiome,” Building and Environment, 80: 274–282.
3. **Maestre J.P.**, Wahman D.G., and Speitel G. E. 2013 “Monochloramine Cometabolism by Nitrosomonas europaea under Drinking Water Conditions” Water Research 47, 4701-4709.
4. Bates S., Ahrendt S., Bik H, Bruns T.D., Caporaso J.G., Maestre J.P et al., 2013 “Meeting Report: Fungal ITS Workshop (October 2012)” *SIGS-Standards in Genomic Science*. 8, 1.
5. Gabriel, D., Prado, O.J., Lafuente, J., Gamisans, X, **Maestre. J.P**., Hernandez J., Dorado, A.D. 2011. “Utilisation of activated carbon in biofilters for elimination of industrial waste gases” Reduction, modification and valorization of sludge (REMOVALS). *IWA publishing*. London. UK.
6. **Maestre, J.P.,** *Rovira R.,* Álvarez-Hornos F.J., Fortuny M., Lafuente J., Gamisans X., Gabriel D. 2010. “Bacterial community analysis of a gas-phase biotrickling filter for biogas mimics desulfurization through the rRNA approach” *Chemosphere*. 80, 872-880.
7. **Maestre, J.P.,** *Rovira, R.*, Gamisans, X., Kinney, K.A., Kirisits, M.J., Lafuente, J., Gabriel, D. 2009. “Characterization of the Bacterial Community in a Biotrickling Filter Treating High Loads of H2S by Molecular Biology Tools” *Water Science and Technology*. 59, 1331-1337.
8. Baquerizo, G., **Maestre, J.P.**, Machado, V.C., Gamisans, X., Gabriel D. 2009. “Long-term ammonia removal in a coconut fiber-packed biofilter: analysis of N fractionation and reactor performance under steady-state and transient conditions” *Water Research*. 43, 2293-2301.
9. Dorado A.D., Baquerizo G., **Maestre J.P.**, Gamisans X., Gabriel D., Lafuente J. 2008. “Modeling of a bacterial and fungal biofilter applied to toluene abatement: kinetic parameters estimation and model validation” *Chemical Engineering Journal.* 140 52-61
10. **Maestre, J.P.**; Gamisans, X.; Gabriel, D.; Lafuente, J. 2007. “Fungal biofilters for toluene biofiltration: evaluation of the performance with four packing materials under different operating conditions” *Chemosphere*. 67, 684-692.
11. Gabriel, D., **Maestre J.P.**, Martín L., Gamisans, X., Lafuente. J. 2007. “Characterization and performance of coconut fiber as packing material in the removal of ammonia in gas-phase biofilters” *Biosystems Engineering*. 97, 481-490.
12. Baquerizo, G., **Maestre, J.P.**, Sakuma, T., Deshusses, M.A., Gamisans, X., Gabriel, D., Lafuente, J. 2005. “A detailed model of a biofilter for ammonia removal: Model parameters analysis and model validation” *Chemical Engineering Journal*. 113, 205-214

**PEER-REVIEWED CONFERENCE PROCEEDINGS**

1. Maestre J.P., Sangireddy H., Passalacqua P., Kinney, K. A. “UTBiome: Citizen Science and Campus Community Engagement” Citizen Science Conference San Jose, CA, 10-13, February, 2015.
2. Maestre J.P., Siegel, J., Khurshid S., Royse K., Horner S., Kinney K.A. “Assessing Pollutant Exposures in Rural Homes Using a Filter Forensics Approach”. Presented at the 33rd Annual American Association of Aerosol Research, Orlando, FL, 20-24 October 2014.
3. Kinney, K. A., King, M., Caya, A., Wooldridge C., Maestre, J.P., Ziv-El M. Hassan Y., “Biofilms and Bioaerosols in Showers”. Presented at the 33rd Annual American Association of Aerosol Research, Orlando, FL, 20-24 October 2014.
4. Siegel, J., Maestre J.P., Xu Y., Khurshid S., Kinney K.A. “Contextualizing Particles on HVAC Filters”. Presented at the 33rd Annual American Association of Aerosol Research, Orlando, FL, 20-24 October 2014.
5. Maestre J.P., Passalacqua P., Sangireddy H., Caya A., Wooldridge C., Zaatari M. “Mapping the UT-Austin Microbiome: Exploring the Outdoor to Indoor Gradient” 2014 Indoor Air, Hong Kong 7-12 July 2014.
6. Sangireddy H., Maestre J.P., Passalacqua P., Kinney, K.A., Kiristis M.J.
“Mapping the UTBIOME” 2014 UC343 ESRI-User Conference, July 14-18, San Diego, California
7. Kinney, K. A., Hoisington, A., Maestre, J.P. and Siegel, J., “Evaluation of Microbial Survivability and DNA Persistence on HVAC Filters” 2013. Oral presentation. Environmental Health Conference, Basel, Switzerland 19-23 August 2013.
8. Kinney, K. A., **Maestre, J.P.**, King, M., Caya, A., Hoisington, A., “Characterization and Source Tracking of Bioaerosols in Residential Showers”. In: Proceedings of *2013 Environmental Health Conference*, Basel, Switzerland 19-23 August 2013.
9. **Maestre, J.P.**, Hoisington, A., Kinney, K. A., and Siegel, J., “Effect of Fungal Barcode Selection on the Interpretation of the Indoor Microbiome”, Accepted for Poster presentation at *ASM (American Society of Microbiology) General Meeting*, Denver, Colorado, USA, 17-21 May 2013.
10. Kinney, K. A., Hoisington, A., **Maestre, J.P.** and Siegel, J., “Improving the Toolbox for Indoor Microbiome Studies: The Environmental/Building Scientist Perspective”, Presented at the *Sloan MBE QIIME/ VAMPS Workshop*, Boulder, Colorado, 17-18 October 2012.
11. Hoisington, A., **Maestre, J.P.**, Bae, S., King, M., Siegel, J. and Kinney, K., “Comparing the Indoor Microbiome from Six Different Bioaerosol Samplers” , Presented at the *31st Annual American Association of Aerosol Research*, Minneapolis, MN, 8-12 October 2012.
12. Hoisington, A., **Maestre, J.P.**, Siegel, J. and Kinney, K.A., “Effect of Store Type, Location and Season on the Microorganisms Captured in HVAC Filter Dust Recovered from Retail Facilities”, Presented at the *31st Annual American Association of Aerosol Research*, Minneapolis, MN, 8-12 October 2012.
13. **Maestre, J.P.**, Hoisington, A., Bae, S., King, M., and Kinney, K.A., “Coupling a Viable Bioaerosol Collector (VBAC) with Pyrosequencing to Characterize a Dynamic Bioaerosolization Event” , Poster Presented at the *31st Annual American Association of Aerosol Research*, Minneapolis, MN, 8-12 October 2012.
14. Hoisington, A., **Maestre, J.P.**, Siegel, J. and Kinney, K.A., “Assessment of the Indoor Microbiome Using HVAC Filters: Comparison of Bioanalytical Techniques” , Presented at the *Second International Conference on Building Energy and the Environment*, Boulder, Colorado, 1-4 August 2012.
15. Kinney, K. A., Hoisington, A., **Maestre, J.P.**, Siegel, J. “What is in the Air in Retail Stores? A DNA-based Study of Bacterial and Fungal Communities in Retail Environments” , Presented at *Healthy Buildings 2012*, Brisbane, AU, 8-12 July 2012.
16. **Maestre, J.P.**, Hoisington, A., Bae, S., King, M., Kinney, K. A., “Characterization of the Fungal Microbiome Aerosolized in a Residential Shower Unit” , Presented at *Healthy Buildings 2012*, Brisbane, AU, 8-12 July 2012.
17. Hoisington, A., **Maestre, J.P.**, Siegel, J. and Kinney, K., “Bacterial and Fungal Microbiome in Retail Stores”, Presented at the *Microbiology of the Built Environment Symposium*, Boulder, Colorado, 30 May-1 June 2012.
18. Hoisington, A., **Maestre, J.P.**, Bae, S., King, M., and Kinney, K.A., “Dynamic Monitoring of the Aerosolized Microbiome in Shower Units”, Poster Presented at the *30th Annual American Association of Aerosol Research*, Orlando, FL, 3-7 October 2011.
19. **Maestre J.P.,** Rovira R., Gamisans X., Kinney K.A., Kirisits M.J., Lafuente J., and Gabriel D., 2008. “Bacterial Community Structure in a Biotrickling Filter Treating High Loads of H2S by Terminal Restriction Fragment Length Polymorphism (T-RFLP) and 16S Clone Library”. Oral Presentation at *USC-UAM 2008 Conference on Biofiltration For Air Pollution Control, Long Beach*, CA, 22-24 October 2008.
20. Rovira R., **Maestre J.P.**, Gamisans X., Lafuente J., Mas J., and Gabriel D., 2009. “Use of molecular biology techniques to compare the bacterial community diversity of a lab-scale biofilter and an industrial biofilter treating high loads of H2S”. Oral Presentation at *10th International Chemical and Biological Engineering Conference- CHEMPOR*, Braga, Portugal. 4- 6 September 2008.
21. Ho C., **Maestre J. P.**, Kinney K., and Kirisits M.J., 2007. “Microbial Community Structure of Sulfur-Oxidizing Cultures Enriched from Wastewater”. Oral presentation at *AICHE 2007 Annual Meeting*, Salt Lake City, UT, 4-9 November, 2007.
22. Baquerizo G., **Maestre JP.**, Gamisans X., Gabriel D., and Lafuente J., 2007 “Study of ammonia removal by gas-phase biofiltration: effects of shock loads and watering rate on biofilter performance” Oral presentation at *Biotechniques for air pollution control*. A Coruña, Spain, 3-5 October, 2007.
23. **Maestre J.P.,** Prado O.J., Gamisans X., Gabriel D., and Lafuente J., 2006. “Performance of fungal-based biofilters for toluene degradation under different operating conditions”. Oral presentation at *USC-TRG Conference on Biofiltration*. Long Beach, California, USA, 18–20 October, 2006.
24. **Maestre JP.**, Vijayarengan P., Gamisans X., Gabriel D., and Lafuente J. “Comparison of organic packing materials for toluene biofiltration” Oral presentation at *Biotechniques for air pollution control*, A Coruna, Spain, October 5-7, 2005
25. Martín L., Ruiz N., **Maestre J.P.**, Díaz O., Gamisans X., Gabriel D., and Lafuente J. “Characterization of organic parking materials in the removal of ammonia gas in automated biofilters”, Oral Presentation at the *International Conference of the FAO-ESCORENA RAMIRAN*, Murcia, Spain, 6-9 October, 2004.

**COMMUNITY AND PROFESSIONAL SERVICE**

**Volunteering**:

* UT Elementary School. I believe that teaching interesting science topics to children from underserved communities will expose them to research and increase the diversity of representation in scientific fields. UTES serves the underserved community of East Austin. The project was created to provide quality education for children from low income families and introduce research being conducted at The University of Texas into the classroom, exposing the students to the most innovative ideas and the newest scientific developments.
* Alamo Community Garden: I serve on the board of the garden, in the community engagement team. The Alamo Community Garden is an organization based in East Austin, the main goal of which is to provide space, means and agricultural knowledge to produce sustainable, organic food for the local underserved community. We are currently designing a rainwater harvesting system to provide irrigation water for the garden.

**Memberships**

* AEESP: Association of Environmental Engineering & Science Professors
* WEAT: Water Environment Association of Texas
* ASM: American Society of Microbiology
* ISIAQ: [International Society of Indoor Air Quality and Climate](http://www.isiaq.org/)
* AAAR: American Association for Aerosol Research
* WEF: Water Environment Federation
* ASM: American Society for Microbiology**Reviewer**:
* Journal of Hazardous Materials
* PLOS One
* Environment Protection Engineering