November 2018

CURRICULUM VITAE

Luisa A. Marcelino

Research Assistant Professor
Department of Civil and Environmental Engineering
McCormick School of Engineering and Applied Sciences
Northwestern University
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EDUCATION

University of Lisbon, Portugal - Massachusetts Institute of Technology, Cambridge, MA
Ph.D. in Molecular Biology/Genetics, 1998
University of Lisbon Portugal, degree *in absentia* through Massachusetts Institute of Technology

University of Lisbon, Portugal - BS./MS. in Plant Biotechnology and Molecular Biology, 1990

PROFESSIONAL EXPERIENCE

Northwestern University, Evanston, IL. July 2009 – present
Lecturer, Department of Civil and Environmental Engineering

Northwestern University, Evanston, IL. June 2007 – present
Research Assistant Professor, Department of Civil and Environmental Engineering

Field Museum of Natural History, Chicago, IL. May 2007 – present
Research Associate, Department of Zoology, Fishes

Northwestern University, Evanston, IL. January 2006 – December 2006
Research Associate, Biomedical Engineering Department.

Massachusetts Institute of Technology, Cambridge, MA. 2001 – November 2005
Postdoctoral Associate and later Research Scientist, Department of Civil and Environmental Engineering

Massachusetts Institute of Technology, Cambridge, MA. August 1998 – December 2000
Postdoctoral Associate, Center for Environmental Health Sciences

Massachusetts Institute of Technology, Cambridge, MA. 1995 – July 1998
Ph.D. candidate and Research Assistant, Center for Environmental Health Sciences

University of Lisbon, Lisbon, Portugal 1993 – December 1994
Ph.D. candidate and Research Assistant, Department of Genetics, Medical School

Perkin Elmer (Applied Biosystems), Foster City, CA September 1993 – October 1993
Visiting Research Scientist, Research and Development Department

University of Lisbon, Lisbon, Portugal September 1991 – 1992
Research Assistant, Department of Plant Biology, School of Sciences

TEACHING AND UNDERGRADUATE RESEARCH SUPERVISING

CEE 361-2: Public and Environmental Health since 2010 - present
CEE 361-1: Environmental Microbiology Winter since 2010 - present
CEE 361: Environmental Microbiology and Public Health, Winter 2008 and 2009
CEE 399: undergraduate research Project (10 undergraduates), from 2008 -2017
1998-2005, Undergraduate Research Projects Supervisor, MIT
1992-1994, Continuous Education Studies Instructor, Medical School, University of Lisbon Portugal

POST-DOCTORAL FELLOW RESEARCH SUPERVISION

Tim Swain, 2010, Ph.D. Biology, Florida State University

GRADUATE STUDENT RESEARCH SUPERVISION

Valentina Stoyneva, MS Biomedical Engineering, 2011 Thesis entitled “Experimental techniques for measuring light amplification in corals and role of the skeleton in the modulation of their susceptibility to bleaching”.

UNDERGRADUATE STUDENT RESEARCH SUPERVISION

Supervision of 25 undergraduate students, with 12 students included as co-authors in peer-reviewed publications due to their significant contributions to the ongoing research projects, 4 students completed their Honor Thesis and 2 students received awards for best Honor thesis.

HONORS AND AWARDS

Fletcher Undergraduate Research Awards for Adviser of best UGR, Northwestern, 2012
Chemistry of Life Processes Chairman's Innovation Award, 2009 Chemistry of Life Processes, Northwestern University
Takeda Entrepreneurship Award, Finalist, 2002
European foundation E.R.A.S.M.U.S (March to August, 1990)
Portuguese Engineering and Biotechnology Foundation (September, 1990)
Scholarship of the Science Program conceded by the Portuguese National Technological and Scientific Organization (1991-1994)
Scholarship of the Portuguese PRAXIS XXI Program (1995)
Scholarship of the Portuguese-American Foundation (January to June, 1996)
European Community (Environment Contract EV5V-CT920197, 1994-1995)

INVITED TALKS AND SEMINARS

“Coral in the Coal Mine: What are the Oceans Telling Us?” Northwestern Climate Change Symposium, November 9-10, 2017, Evanston, IL

“Why do corals bleach differently? Two versions of the story told by the coral and its symbiotic algal partner.” National Coral Reef Institute, Nova Southeastern University, Fort Lauderdale, Fl, April 9-12, 2017

“A Novel Framework of Analysis to Identify and Evaluate Key Determinants of Bleaching”, University of Copenhagen, Helsingør, Denmark, May 29- June 2, 2017

“The role of coral skeletal scattering in bleaching response”, Brown Bag Seminars, Shedd Aquarium, Chicago, IL, May 29, 2016

“The impact of global climate change- induced thermal stress on coral reef ecosystems”, Northwestern Civil and Environmental Engineering Environmental Seminar, Evanston, IL, September 2016

"Coral skeletal light-scattering accelerates bleaching", Coral Climate Forum, Field Museum of Natural History, Chicago, IL, June 2015

"Why do corals bleach and die differently?" Environmental Engineering and Science Seminars, Northwestern University, November 2014 and April 2015

"Effects of global climate change on coral reefs as marine ecosystems", Searle Center Research Roundtable on Natural Preservation In A Rapidly Changing Climate, October 4-5 and July 17- 18, 2014 and 2015, Chicago IL

"Coral Bleaching: The role of two partners" Coral Climate Forum, Field Museum of Natural History, Chicago, IL, April 2012

"The role of the algal symbiont and animal coral in the health of coral reefs", Brown Bag Seminars, Shedd Aquarium, May 2011

"Standardization of bleaching and mortality records to identify key determinants of bleaching, Coral Histology workshop, Mote Marine Laboratory, August 23-27, 2010

"Tools to access bleaching response in corals", Meeting at the International Registry of Coral Pathology Center for Coastal Environmental Health & Biomol. Research, National Oceanic Atmospheric Administration, Oxford, MD, September 7-11, 2009

"Use of novel optics technology to establish susceptibility, resistance, and recovery indicators of stony corals to bleaching", Chemistry of Life Processes Institute, Northwestern, January 2008

PUBLICATIONS
https://scholar.google.com/citations?user=rSwpJWYAAAAJ&hl=en&oi=ao

Peer-reviewed Journal Publications (*Student coauthors)

1. Swain T.D., Lax S., Lake N.*, Grooms H.*, Backman V., Marcelino L.A., Relating coral skeletal structures at different length scales to growth, light availability to Symbiodinium, and thermal bleaching, Frontiers in Marine Science 5, 450 (2018)
2. Swain T.D., Bold E.C.*, Osborn P.C.*, Baird. A.H., Westneat M.W., Backman V., Marcelino L.A. Physiological integration of coral colonies is correlated with bleaching resistance, Mar Ecol Prog Ser, 586: 1–10 (2018) [Feature Article]
3. Swain TD, Westneat WM, Backman V, Marcelino LA. Phylogenetic analysis of symbiont transmission mechanisms reveal evolutionary patterns in thermotolerance and host specificity that enhance bleaching resistance among vertically transmitted Symbiodinium. European Journal of Phycology 53, 1-17 (2018)
4. Swain, T.D., DuBois, E.*, Goldberg, S.J. *, Backman V., Marcelino, L.A., Bleaching response of coral species in the context of assemblage response, Coral Reefs 36: 395–400 (2017).
5. Swain T.D, Vega-Perkins J.B. *, Oestreich W. *, Triebold C. *, DuBois E.*, Henss J., Baird A, Siple M., Backman V., Marcelino L.A. Differential Bleaching Among 374 Coral Taxa – role of measurement uncertainty, environmental factors and intrinsic holobiont factors, Coral bleaching response index: a new tool to standardize and compare susceptibility to thermal bleaching, Glob Chang Biol. 2016 Apr 13. doi: 10.1111/gcb.13276.
6. Swain T.D., DuBois E.*, Gomes, A.*, Stoyneva V.P.*, Radosevich A.J.*, Henss J., Wagner M.E.*, Velazquez E.*, Traub J., Kennedy B.J.*, Janczak C.M., Grigorescu A.A., Westneat M.W., Sanborn K., Levine S., Schick M., Parsons G., Rogers J.D., Backman V., Marcelino L.A. Skeletal light scattering decreases bleaching susceptibility of reef-building corals, BMC Ecol. 2016 Mar 21;16(1):10. doi: 10.1186/s12898-016-0061-4.
7. Swain T.D, Chandler J.*, Backman V., Marcelino L.A., Consensus thermotolerance ranking for 110 Symbiodinium phylotypes: an exemplar utilization of a novel iterative partial rank

aggregation tool with broad application potential. Functional Ecology, 2016 July doi: 10.1111/1365-2435.12694
8. Marcelino L.A.,Westneat M., Stoyneva V.*, Henss J., Rogers J.D., Radosevich A.*, Turzhitsky V.*, Siple M.*, Fang A.*, Swain T.D., Fung J.* and Backman V. Light scattering in coral skeleton - evolutionary trends in coral bleaching and in light amplification, PLoS One, 2013; 8 :e61492
9. Swain T.D., Lax S., Backman V., Marcelino L.A., Uncovering the role of Symbiodinium assemblage composition and structure in coral bleaching response by minimizing sampling and evolutionary biases, *(in review at Molecular Ecology Resources)*
10. Swain T.D., Lax S., Gilbert J., Backman V., Marcelino L.A., Role of Symbiodinium thermotolerance in coral susceptibility to bleaching: use of coral-Symbiodinium networks and phylogenetic-corrected analysis, *in preparation*
11. Spicer G.L.C., Eid A., Wangpraseurt D., Winkelmann J.A., Swain T.D., Yi J., Kuhl M., L. A. Marcelino, and V. Backman, Light scattering and absorption properties of tissue and coral skeleton using Inverse Spectroscopic Optical Coherence Tomography (ISOCT), *in preparation*

12. Sudo H., Li-Sucholeiki X.-C.; Marcelino L.A.; Gruhl A.N.; Herrero-Jimenez P.; Thilly W.G., et al., Fetal-juvenile origins of point mutations in the adult human tracheal bronchial epithelium: absence of detectable effects of age, gender or smoking status. Mutation Res., 2008; 646:25-40
13. Marcelino L.A., Backman V., Donaldson A., Steadman C., Thompson J, Pacocha S., Lien C., Veneziano D., Lim E., and Polz M.F., Accurate identification of low abundant targets in pools of similar sequences by revealing hidden correlations in oligonucleotide microarray data, Proc Natl Acad Sci USA. 2006; 103(37):13629-34.
14. Sudo H., Li-Sucholeiki X.-C., Marcelino L.A., Thilly W.G., *et al.*, Distributions of five common point mutants in the human tracheal-bronchial epithelium, Mutation Res, 2006; 596(1-2):113-1127.
15. Thompson J.R., Randa M.A., L.A Marcelino, Tomita-Mitchell A., Lim E., Polz M.F., Diversity and dynamics of a North Atlantic coastal Vibrio community, Applied and Environmental Microbiology 2004; 70(7):4103-10.
16. Acinas S.G., Marcelino L.A., Klepac-Ceraj V., Polz M.F., Divergence and redundancy of 16s rRNA sequences in genomes with multiple rrn operons J. Bacteriology, 2004; 186 (9): 2629-2635.
17. Thompson JR, Marcelino L.A., Polz MF. Heteroduplexes in mixed-template amplifications: formation, consequence and elimination by 'reconditioning PCR". Nucleic Acids Res. 2002; 30(9):2083-8.
18. Zheng W, Marcelino L.A., Thilly WG. Scanning low-frequency point mutants in the mitochondrial genome using constant denaturant capillary electrophoresis. Methods Mol Biol. 2002;197:93-106, PMID:12013815
19. Tomita-Mitchell A., Kat A.G., Marcelino L.A., Li-Sucholeiki X.-C., Griffith J., and Thilly W.G., Mismatch repair deficient human cells: spontaneous and MMNG-induced mutational spectra in the HPRT gene, Mutation Res, 2000; 450:125-38.
20. Monteiro C, Marcelino LA, Armour JA *et al.,*. Molecular methods for the detection of mutations. Teratog Carcinog Mutagen, 2000; 20(6): 357-86.
21. Marcelino L.A., Galvin M., Mayrand E., Proenca M.J., Martins G., Rueff J., and Monteiro C., Fast and reliable method for the routine detection of mutations in human tumors: Multiple fluorescence-based long linker arm nucleotides assay (mf- LLA), BioTechniques, 1999; 26, 1134-1148.
22. Marcelino L.A., and Thilly W.G., Mitochondrial mutagenesis in Human cells and tissues, Mutat Res, 1999; 434,177- 203.

23. Li-Sucholeiki X.-C., Khrapko K., Andre P.C., Marcelino L.A., Karger B.L., and Thilly W.G., Applications of constant denaturant capillary electrophoresis/high fidelity polymerase chain reaction to human genetic analysis, Electrophoresis, 1999; 20, 1224-1232.
24. Marcelino L.A., Andre P., Krapko K., Coller H.A, Griffith J. and Thilly W.G., Chemically induced mutations in mitochondrial DNA of human cells: mutational spectrum of N-methyl-N'-nitro-N-nitrosoguanidine, Cancer Res, 1998; 58, 2857-2862.
25. Glaser P, Kunst F, Arnaud M, Coudart MP, Gonzales W, Hullo MF, Ionescu M, Lubochinsky B, Marcelino L, Moszer I, *et al.*, *Bacillus subtilis* genome project: cloning and sequencing of the 97 kb region from 325 degrees to 333 degrees, Mol. Microbiol, 1993; 10 (2): 371-84.

Book Chapters

26. Thompson J.R., Marcelino L.A., Polz M.F., Diversity, sources and detection of human bacterial pathogens in the environment. Oceans and Health: Pathogens in the marine environment (eds. Shimshon S. and Colwell R.). 29- 68 (Springer New York, 2005).
27. Marcelino L.A., and Monteiro C.J., Update to: Multiple fluorescence-based long linker arm nucleotides assay (mf- LLA): a fast and reliable method for the routine detection of mutations in human tumors, polymorphisms- detection and analysis. BioTechniques series, (eds. Burczak JD and Mardis E). 378-383 (Eaton Publishing/ Natick, 2000).

ORAL PRESENTATIONS AT SCIENTIFIC MEETINGS

28. Swain TD, Backman VB, Marcelino LA, Phylogenetic analysis of Symbiodinium transmission modes reveal evolutionary patterns in thermotolerance and host specificity that may contribute to coral bleaching resistance, 2018, 9th International Symbiosis Society Congress, July 15-20, 2018, Oregon USA
29. Swain TD, Backman VB, Marcelino LA. Symbiodinium thermotolerance and coral susceptibility to bleaching. 13th International Coral Reef Symposium, Honolulu, Hawaii, June 2016.
30. Marcelino LA, Swain TD, Backman VB. Coral skeletal light scattering and susceptibility to thermal bleaching. 13th International Coral Reef Symposium, Honolulu, Hawaii. June 2016.
31. Swain TD, DuBois E, Gomes A, Stoyneva VP, Radosevich AJ, Henss J, Wagner ME, Derbas J, Grooms HW, Velazquez EM, Traub J, Kennedy BJ, Janczak CM, Grigorescu AA, Westneat MW, Sanborn K, Levine S, Schick M, Parsons G, Rogers JD, Backman VB, Marcelino LA. Efficient light transport through coral skeletons precipitates bleaching response. 44th Annual Benthic Ecology Meeting, Québec, Canada, 4-7 March 2015
32. Williams K*, Swain TD, Wagner M*, Marcelino L. 2013. (presented by first author) Does symbiont phylotype determine host susceptibility to stress? 3rd NU Bioscientist Symposium. Evanston, Illinois.
33. Swain T.D., Gomes A., Lake N., Radosevich A., Pickard K., Kennedy B., Humecki P., Westneat M.W., Backman V., Luisa A. Marcelino, Coral skeletal fractality modulates light-backscattering to symbionts and bleaching susceptibility, (presented by first author) International Coral Reef Symposium, Cairns, Queensland, Australia, 9-13 July 2012
34. Swain T.D., Pickard K, Lake N, Henss J., Radosevich A, Gomes A., Westneat M.W., Backman V., Luisa A. Marcelino(presented by first author) “Light-scattering properties of coral skeletons at multiple morphological length-scales increase the risk of Coral Bleaching” Benthic Ecology Meetings, Mobil, Alabama, March 16-20, 2011
35. Turzhitsky, V.; Fang, A.; Fung, J.; Henss, J.; Siple, M.; Stoyneva, V.; Rogers, J. D; Wolfman, H.; Radosevich, A.; Backman, V.; Marcelino, L. A. “Optical characterization of coral skeleton with low-coherence enhanced backscattering spectroscopy.” *Optical Society of America: Biomedical Optics*, Miami, FL, USA, April 11-14, 2010.
36. A. Fang, J. Fung, E. Daly, J. Henss, M. Siple, V. Stoyneva, V. Turzhitsky, J. Rogers, M. Westneat, V. Backman, L. Marcelino (November, 2008), Characterization of optical properties

of reef-building corals and its implications on bleaching susceptibility, 19th. Annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics, Argonne, IL

37. Backman V., Siple M., Daly E., Fang A., Fung J., Stoyneva V., Henss J., Westneat M., Turzhitsky V., Rogers J., Marcelino L.A. 2008. (presented by first author) Novel Optical Technique for characterization of light absorption and distribution in reef-building corals, 11th International Coral Reef Symposium. Fort-Lauderdale, Florida
38. Marcelino L.A Siple M., Daly E., Fang A., Fung J., Stoyneva V., Henss J., Westneat M., Turzhitsky V., Rogers J., Backman V. 2008. Characterization of optical properties of reef-building coral skeletons, 11th International Coral Reef Symposium. Fort-Lauderdale, Florida

ABSTRACTS AND CONFERENCE PROCEEDINGS

39. Thompson J.R., Acinas S.G., Klepac-Ceraj V., Pacocha S., Pharino C., Hunt D.E., Marcelino L.A., Benoit J., Rupavtarm-Sarma R., Distel D.L., and Polz M.P. (February 2005) Environmental bacterial diversity from communities to genomes, Genomes to Life, Department of Energy. Washington DC
40. Marcelino L.A., Lien C., Pacocha S., Bouzo B. Polz M.F., (May 2004), A DNA microarray approach to identifying specific bacterial strains, based on microarray fingerprinting, American Society of Microbiology. Washington Convention Center, Washington DC.
41. Sudo H., Li-Sucholeiki X.-C., Marcelino L.A., Gruhl A., Zarbl H., Willey J.C. and Thilly W.G., (July 2004) The effect of cigarette smoking on point mutations in human lung epithelium. The Nineteenth Aspen Cancer Conference: Mechanisms of toxicity, carcinogenesis, cancer prevention and cancer therapy 2004, Aspen CO.
42. Marcelino L.A., Lien C., Polz M.F., (May 2003) Optimization and evaluation of direct and indirect incorporation of fluorescent dyes into ribosomal RNA for microarray analysis of naturally occurring bacteria. American Society of Microbiology. Washington Convention Center, Washington DC.
43. Khrapko, K, Coller, H.A, Hanekamp, J.S., Marcelino L. A., and Thilly, W.G.(1998) capillary hybridization for identification of mutations. Bioengineering: building the future of biology and medicine. National Institute of Health. Bethesda, Maryland.
44. Marcelino,L.A., and Thilly (1997) Mutational spectrum of N-methly-N'-nitro-N- nitrosoguanindine (MNNG) in human cell mitochondrial DNA. Gordon Research Conferences, New London, New Hampshire.
45. Marcelino L.A., M. Galvin, E. Mayrand, and C. Monteiro (1995) Multiple Color Fluorescence Based Long Linker Arm (LLA) Analysis: A rapid method for the detection of point mutations. American Journal of Human Genetics, 1995:57: 1265: Suppl. Human Genome Meeting- 9196, Heidelberg, Germany, 1996.
46. Moreira, A , da Costa, J. D., Santos, R.N., Monteiro, M.J., Matias, D., Marcelino, L.A., Martins, G., Almeida, M.R., Rueff, J.A., and Monteiro, C.(1995). Loss of heterozygosity in the MCC Gene in Human lung squamous cell carcinoma using microsatellites and fluorescence-based semi-automated genotyping, Medizinische Genetik, 2: 138: abs.
47. Moreira A, da Costa J. D., Santos R.N., Marcelino L. A., Martins G, Almeida M.R, Matias D, Rueff, J.A., Monteiro C. (1994). Loss of heterosigosity in the MCC locus in human squamous lung cancer using (CA)n and fluorescent DNA technology. Annals of Oncology, 5:8 :abs.
48. Albergaria I, Martins G, Marcelino L.A., Rueff, J., Monteiro C.J. (1993). The Use Of Glycerol in G/C-rich DNA amplification - *g6dp* gene as an example, American Journal of Human Genetics 1993: 53 (3): 1605: Suppl.
49. Monteiro C.J., Santos, R.N., Martins, G., Marcelino, L.A, Almeida, M.R., Martins, A.P., Ramos, S., Rueff, J., Melo, J. (1993). Di-nucleotide individual profiles as a tool to identify the origin of homograph cells (in non- and immunosupressed patients), American Journal of Human Genetics :53:1742: Suppl.

50. Monteiro, C.J., Albergaria, I., Almeida, M.R.,. Martins, G, Marcelino, L.A, Rueff, J. (1993). The use of glycerol in G/C-rich DNA amplification: *g6dp* gene as an example, American Journal of Human Genetics, 53: 1605: abs.

PROFESSIONAL SERVICE

Membership in Professional Societies: American Society for Microbiology, American Association for the Advancement of Science, International Society for Reef Studies (ISRS), American Society of Limnology and Oceanography

Journal Peer-reviewer: Biotechniques, Journal of Medical Genetics, Limnology and Oceanography, Nature Communications, PLoS One, Proc Royal Academy of Sciences London B.

COLLABORATORS:

- Vadim Backman, Professor of Biomedical Engineering at McCormick School of Engineering, Northwestern University
- Mark Westneat, Professor, Department of Organismal Biology and Anatomy, University of Chicago
- Jack Gilbert, Associate Professor, Department of Ecology & Evolution Department of Surgery and Associate Director, Institute for Genomics and Systems Biology
- Bernhard Riegl, Associate Director, National Coral Reef Institute, NOVA Southeastern University
- Andrew Baird, Professorial Research Fellow, James Cook University, Australia
- Michael Kühl, Professor, Department of Environmental Ecology, University of Copenhagen
- George Parsons, Senior Curator at the Fishes Department, Shedd Aquarium http://www.sheddaquarium.org/Animals--Care/Animal-Experts/George-Parsons/
- Anderson Mayfield, Researcher at the National Museum of Marine Biology and Aquarium in Taiwan
- Andrew Jacobson, Professor of Earth and Planetary Sciences and Director of the Environmental Sciences Program, Northwestern University