

LAURA VILLANUEVA

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EDUCATION

- University of Barcelona (Faculty of Biology), BSc degree: Biology, 2001.
- University of Barcelona (Faculty of Biology), MSc degree: Microbial Genetics. Advisor Prof. Dr. Ricardo Guerrero, 2003 (*cum laude*).
- University of Barcelona (Faculty of Biology), PhD degree: Molecular Microbial Ecology. Advisor: Prof. Dr. Ricardo Guerrero, 2005, (*cum laude*).

RESEARCH EXPERIENCE

Royal Netherlands Institute for Sea research (NIOZ), 2009–2013

Dep. Marine Organic Biogeochemistry
Tenure-track research Scientist in Geomicrobiology

Harvard FAS Center for Systems Biology, 2007–2009

Postdoctoral fellow; Advisor: Dr. Iren A. Chen.

University of Massachusetts (MA), 2006–2007

Postdoctoral fellow; Advisor: Dr. Derek Lovley.

UFZ- Center for Environmental Research, Leipzig (Germany), 2005 (2 months)

Advisor: Dr. Roland Geyer.

Center for Biomarker Analysis, University of Tennessee, Knoxville (TN),

2002–2004 (6 months total). Advisor: Prof. D.C. White.

Consiglio Nazionale delle Ricerche. Istituto di ricerca sulle acque. Roma (Italy), 2003
(3 months). Advisor: Dr. Valter Tandoi. Skerman micromanipulation of filamentous bacteria and Fluorescence *in situ* hybridization (FISH) techniques.

Institute for Marine Sciences, ICM, Barcelona (Spain), 2001 (4 months).

Undergraduate internship in the Dinoflagellates group. Advisor: Dr. Esther Garcés.

Université Pierre et Marie Curie (Paris VI), CNRS, Banyuls-sur-Mer (France), 2000 (2
months). Undergraduate internship in the Molecular and cell biology team (Arago
Laboratoire). Advisor: Dr. Hervé Moreau.

University of Barcelona, Department of Microbiology (Spain), 1999–2005

Undergraduate student in the Ecogenetics group. Advisor: Prof. Ricardo Guerrero.

TEACHING & OUTREACH

- Scientific contributor for “School at Sea” (<http://schoolatsea.com/en>).
- Scientific coordinator of the Darwin Summer School on Biogeosciences 2012.
- Darwin Summer School of Biogeosciences- Perturbation of the carbon cycle. 4-15th July 2011. Utrecht/Texel. Organizer and contributor.
- Lecturer of “Molecular Microbial Ecology: Methods and Applications”. 2 days-course in the Master in Advanced Microbiology of the University of Barcelona. 11-12th January 2010 and 2012.
- Lecturer of “Molecular Geomicrobiology” at the Master course of “Microbes & Biogeochemistry”. Utrecht University, 2012-2013.
- Outreach at NIOZ: Courses for PhD students and postdocs.
 - o “How to write a successful scientific proposal”
 - o “Giving a good talk: tips to communicate better your research”
- Lecturer of the Harvard University HHMI Outreach Program for High school students (2008-2009).
- Harvard University and University of Barcelona. Mentor of undergraduate students.
- University of Barcelona. Laboratory instructor of Microbiology courses (2002–2005).

AWARDS AND FELLOWSHIPS

- Early Career Travel Grant to attend the ASLO 2013 Meeting.
- PhD award Aquatic Microbiology group of the Spanish Society for Microbiology (2005).
- Student travel grant to attend the 104th ASM General Meeting. New Orleans, LA (2004).
- Travel grant of the Spanish Ministry of Education (2002 and 2003).
- Graduate fellowship from the Spanish Ministry of Education (accepted) and from the Catalan government of Spain (declined), 2002.

INVITED LECTURES since 2009

- Environmental metagenomics symposium 27-Sep-2014 Wageningen. Microbial players of the nitrogen and sulfur cycles in anoxic basin and oxygen minimum zones
- Workshop GDGT-based proxies: State of the art and future directions, 23-25 April 2014, Texel, The Netherlands. Title: Depth-related distribution of a key gene of the archaeal lipid biosynthetic pathway in marine Thaumarchaeota and implications for the GDGT signal.
- Koninklijke Nederlandse Vereniging voor Microbiologie (KNVM) Spring meeting 2014. 15th April, Arnhem, The Netherlands. Title: Abundance and activity of anammox bacteria in marine sediments of the southern North Sea.

- A symposium organized within the 3rd year Biology course Marine Sciences2 Utrecht University 16 January 2014. Ocean of the present, Ocean of the future. Title: Marine Archaea: what can we learn from them
- Annual Conference of the Association for General and Applied Microbiology (VAAM) in collaboration with the Royal Netherlands Society for Microbiology (KNVM), 10-13 March 2013, Bremen, Germany. Title: Tracing seasonal and spatial diversity and activity of marine Thaumarchaeota by using intact polar lipids and gene expression.
- Association for the Science of Limnology and oceanography ASLO Aquatic Sciences Meeting. February 17-22, 2013. New Orleans, LO, USA. Title: Intact polar lipids and gene expression to trace ammonia oxidizing archaeal populations in aquatic environments.
- KNVM Microbial Ecology Fall Meeting 2012, 13th December 2012, Wageningen, Netherlands. Title: Linking archaeal membrane lipids and gene abundance of Thaumarchaeota and uncultured crenarchaeota in a lake setting.
- Geochemistry seminars at Utrecht University, 27th November 2012. Title: Molecular Geomicrobiology: Next challenge in organic biogeochemistry studies?
- Session Microbial Lifestyles & Molecular legacies. Gordon Research Conference in Organic Geochemistry. 29 July-3 August 2012. NH, USA. Title: Mining metabolic and biomarker lipid biosynthesis genes from the environment: Next challenge in organic biogeochemistry?
- Darwin Summer School 2012. Title: Molecular Geomicrobiology: Next challenge in organic biogeochemistry?
- Darwin Summer school 2011. Title: Unraveling microbial ecophysiology with lipid biochemistry and community omics.
- Microbial Ecology Annual Sessions at the Institute for Marine Sciences (ICM-CSIC), January 2012. Barcelona (Spain). Title: New approaches for the study of the Nitrogen Cycle in marine environments.
- Microbial Ecology Annual Sessions at the Institute for Marine Sciences (ICM-CSIC), 8th January 2010. Barcelona (Spain). Title: Lipid biomarkers and functional gene analysis to study marine biogeochemical cycles.

SAMPLING CAMPAIGNS (organization/participation)

- NIOZ North Sea monitoring in R/V Pelagia, September 2013.
- Lake Grevelingen campaign in R/V Luctor, March 2012
- Nicycle campaign November 2010 in North Sea, Terschelling transect in R/V Pelagia
- Assistance in training student and preparation of other campaigns: Nicycle cruises (Feb, May and August 2011), Pacemaker cruise, Long chain diol cruise (Iceland, Summer 2011), sampling trips to Schiermonnikoog.

REVIEWER

- Member of the editorial board of International Microbiology (the official Journal of the Spanish Society for Microbiology).
- Reviewer for Microbial Ecology journal, Environmental Microbiology, Organic Geochemistry, ISME Journal, Journal of Sea Research, Science, PlosOne, FEMS Microbiology Ecology.

PUBLICATIONS

- Villanueva, L., S. Schouten, and J. S. Sinninghe Damsté. 2014. Depth-related distribution of a key gene of the tetraether lipid biosynthetic pathway in marine Thaumarchaeota. Environ.Microbiol. in press.
- Lipsewers, Y.A., Bale, N.J., Hopmans, E.C., Schouten, S., Sinninghe Damsté, J.S., and Villanueva, L. 2014. Seasonality and depth distribution of the abundance and activity of ammonia oxidizing microorganisms in marine coastal sediments (North Sea). Front Microbiol. Sep 5;5:472
- Villanueva, L., Schouten, S., and Sinninghe Damsté, JS. 2014. A Re-evaluation of the Archaeal Membrane Lipid Biosynthetic Pathway. Nat. Rev. Microbiol. 12:438-448. [Pubmed](#)
- Villanueva, L., Besseling M, Rampen S., Rodrigo-Gamiz M., and Sinninghe Damste JS. 2014. Potential biological sources of long chain alkyl diols in a lacustrine system. Org. Geochem. 68:27-30.
- Villanueva, L., Rijpstra, W.I.C., Schouten, S., and Sinninghe Damsté, J.S. 2014. Genetic biomarkers of the sterol-biosynthetic pathway in microalgae. Environ. Microbiol. Reports 6:35-44.
- Villanueva, L., N. Bale, E. C. Hopmans, S. Schouten, and J. S. Sinninghe Damsté. 2014. Diversity and distribution of a key sulpholipid biosynthetic gene in marine microbial assemblages. Environ.Microbiol. 16:774-787.
- Bale NJ*, Villanueva L*, Fan H, Stal LJ, Hopmans EC, Schouten S, Sinninghe Damsté JS. 2014. Occurrence and activity of anammox bacteria in surface sediments of the southern North Sea. FEMS Microbiol Ecol. 89:99-110. *equal contributors
- Villanueva, L., Speth, D.R., van Alen, T., Hoischen, A., and Jetten, M.S.M. 2014. Shotgun metagenomic data reveals significant abundance but low diversity of "Candidatus Scalindua" marine anammox bacteria in the Arabian Sea oxygen minimum zone. Front. Microbiol. 5:31.
- Moore, E., Hopmans, E.C., Rijpstra, W.I.C., Villanueva, L., Dedysh, E., Kulichevskaya, I., Wienk, H., Schoutsen, F., and Sinninghe Damsté. J.S. 2013. Novel mono-, di-, and trimethylornithine membrane lipids in northern wetland planctomycetes. Appl. Environ. Microbiol. 79:6874-6884.
- Bale, N.*, Villanueva, L.*, Hopmans, E.C., Schouten, S., and Sinninghe Damste, J.S. 2013. Different seasonality of pelagic and benthic Thaumarchaeota in the North Sea. Biogeosciences 10:7195-7206. *equal contributors

- Buckles, L.*, Villanueva, L.*, Weijers, J., Verschuren, D., and Sinninghe Damste, J.S. 2013. Linking isoprenoidal GDGT membrane-lipid distributions with gene abundances of ammonia-oxidising Thaumarchaeota and uncultured crenarchaeotal groups in the water column of a tropical lake (Lake Challa, East Africa). *Environ. Microbiol.* 15:2445-2462 (*equal contributors).
- Schouten, S., Pitcher, A., Hopmans, E.C., Villanueva, L., van Bleijswijk, J., and Sinninghe Damsté, J.S. 2012. Intact polar and core glycerol dibiphytanyl glycerol tetraether lipids in the Arabian Sea oxygen minimum zone: I. Selective preservation and degradation in the water column and its consequences for the TEX86. *Geochim. Cosmochim. Acta* 98: 228-243.
- Pitcher, A.*, Villanueva, L.*, Hopmans, E.C., Schouten, S., Reichart, G-J., and Sinninghe Damsté, J.S. 2011. Niche segregation of ammonia-oxidizing archaea and anammox bacteria in the Arabian Sea oxygen minimum zone. *ISME J.* 5:1896-1904.
- Lin, A., Jimenez, J., Derr J., Vera P., Manapat M. L., Esvelt, K., Villanueva L., Liu D. R., Chen I. A. 2011. Inhibition of bacterial conjugation by phage M13 and its protein g3p: quantitative analysis and mechanism. *Plos One* 6:5 (e19991).
- Villanueva L., J. del Campo, and R. Guerrero. 2010. Diversity and physiology of polyhydroxyalkanoate-producing and -degrading strains in microbial mats. *FEMS Microbiol. Ecol.* 74:42-54.
- Villanueva L., J. del Campo, R. Guerrero, and R. Geyer. 2010. Intact Phospholipid and Quinone Biomarkers to Assess Microbial Diversity and Redox State in Microbial Mats. *Microb. Ecol.* 60:226-238.
- Villanueva L., S. A. Haveman, Z. M. Summers, and D. R. Lovley. 2008. Quantification of *Desulfovibrio vulgaris* dissimilatory sulfite reductase gene expression during electron Donor and Acceptor-Limited Growth. *Appl. Environ. Microbiol.* 74:5850-5853.
- Haveman S. A., R. DiDonato, L. Villanueva, E. S. Shelobolina, B. L. Postier, B. Xu, A. Liu, and D. R. Lovley. 2008. Genome-wide Gene Expression Patterns and Growth Requirements Suggest that *Pelobacter carbinolicus* Reduces Fe(III) Indirectly via Sulfide Production. *Appl. Environ. Microbiol.* 74:4277-4284.
- Villanueva L., A. Navarrete, J. Urmeneta, R. Geyer, R. Guerrero, and D. C. White. 2007. Monitoring Diel Variations of Physiological Status and Bacterial Diversity in an Estuarine Microbial Mat: An Integrated Biomarker Analysis. *Microb. Ecol.* 54:523-531.
- Villanueva L., A. Navarrete, J. Urmeneta, R. Guerrero, and D. C. White. 2007. Analysis of the Spatial and Diurnal Diversity in an Estuarine Microbial Mat. *Arch. Microbiol.* 188:137-146.
- Villanueva L., A. Navarrete, J. Urmeneta, D. C. White, and R. Guerrero. 2004. Physiological status and microbial diversity assessment of microbial mats: the signature lipid biomarker approach. *Ophelia* 58:165-173
- Villanueva L., A. Navarrete, J. Urmeneta, D. C. White, and R. Guerrero. 2004. Combined phospholipid biomarker-16S rRNA gene denaturing gradient gel electrophoresis analysis of bacterial diversity and physiological status in an intertidal microbial mat. *Appl. Environ. Microbiol.* 70:6920-6926