

Paula Ramos-Silva, PhD

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Data analysis, research and education are my biggest passions. My work has strong focus on genes and proteins, from bacteria to animals. In my teaching and research, I integrate multiple approaches ranging from molecular biology to large-scale computational analyses of genomics, transcriptomics and proteomics data. Therefore, I see myself as a combination of an experimental and a computational biologist.

EMPLOYMENT HISTORY

01/07/2018 - 31/08/2022	Postdoctoral Researcher <u>Affiliations:</u> Plankton Diversity and Evolution Group, Naturalis Biodiversity Center & Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, The Netherlands <u>Project:</u> Evolution of planktonic gastropod calcification (EPIC) <u>Advisor:</u> Dr. Katja Peijnenburg
01/11/2019 - 30/04/2020	Maternity Leave
01/03/2014 - 30/04/2018	Postdoctoral Researcher <u>Affiliation:</u> Computational Genomics Group, Instituto Gulbenkian de Ciência, Portugal <u>Project:</u> Understanding the evolutionary history and the diversity of bacterial endospore formation (EvoSpore) <u>Advisors:</u> Dr. José Pereira-Leal and Dr. Adriano O. Henriques
09/01/2009 - 19/12/2013	PhD Candidate <u>Affiliations:</u> Computational Science Section, University of Amsterdam, The Netherlands & Biogéosciences, University of Burgundy, France <u>Project:</u> Marie Curie ITN Biomineralization: understanding of basic mechanisms for the design of novel strategies in nanobiotechnology (BIOMINTEC) <u>Supervisors:</u> Prof. Peter Slood, Dr. Jaap Kaandorp and Dr. Frédéric Marin
01/11/2007 - 30/11/2008	Research Analyst <u>Affiliation:</u> Centre of Biological and Chemical Engineering, Instituto Superior Técnico, University of Lisbon, Portugal

EDUCATION

09/01/2009 - 19/12/2013	PhD in Biology Informatics Institute, University of Amsterdam, The Netherlands <u>Thesis:</u> Biocalcification of mollusk shells and coral skeletons. Integrating molecular, proteomics and bioinformatics methods Link
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01/09/2001 - 10/10/2007

Integrated MSc (BSc + MSc) in Biological Engineering
 Instituto Superior Técnico, University of Lisbon, Portugal &
 Faculty of Engineering, Lund University, Sweden
Thesis: Removal of 17 β -estradiol from water using molecularly
 imprinted polyethersulfone microspheres [Link](#)

PUBLICATIONS

Peer-reviewed articles

1. [Ramos-Silva P*](#), Odendaal M-L*, Wall-Palmer D, Mekkes L, Peijnenburg KTCA. Transcriptomic responses of adult versus juvenile atlantids to ocean acidification. *Frontiers in Marine Science*, 2022; 9:801458. (*co-authors) <https://doi.org/10.3389/fmars.2022.801458>
2. [Ramos-Silva P](#), Wall-Palmer D, Marlétaz F, Marin F, Peijnenburg KTCA. Evolution and biomineralization of pteropod shells. *Journal of Structural Biology*, 2021; 213(4):107779. <https://doi.org/10.1016/j.jsb.2021.107779>
3. Wall-Palmer D, Mekkes L, [Ramos-Silva P](#), Dämmer LK, Goetze E, Bakker K, Duijm E, Peijnenburg, KTCA. The impacts of past, present and future ocean chemistry on predatory planktonic snails. *Royal Society Open Science*, 2021; 8:202265. <https://doi.org/10.1098/rsos.202265>
4. Choo LQ, Bal TMP, Choquet M, Smolina I, [Ramos-Silva P](#), Marlétaz F, Kopp, M, Hoarau G, Peijnenburg KTCA. Novel genomic resources for shelled pteropods: a draft genome and target capture probes for *Limacina bulimoides*, tested for cross-species relevance. *BMC Genomics*, 2020; 21(1):11. <https://doi.org/10.1186/s12864-019-6372-z>
5. [Ramos-Silva P](#), Serrano M, Henriques AO. From root to tips: sporulation evolution and specialization in *Bacillus subtilis* and the intestinal pathogen *Clostridioides difficile*. *Molecular Biology and Evolution*, 2019; 36(12):2714-36. <https://doi.org/10.1093/molbev/msz175>
6. Le Roy N, Jackson D, Marie B, [Ramos-Silva P](#), Marin F. The evolution of metazoan alpha-carbonic anhydrases and their roles in calcium carbonate biomineralization. *Frontiers in Zoology*, 2014; 11(1):75. <https://doi.org/10.1186/s12983-014-0075-8>
7. [Ramos-Silva P](#), Kaandorp J, Herbst F, Plasseraud L, Alcaraz G, Stern C, Corneillat M, Guichard N, Durlet C, Luquet G, Marin F. The skeleton of the staghorn coral *Acropora millepora*: molecular and structural characterization. *PLoS One*, 2014; 9(6):e97454. <https://doi.org/10.1371/journal.pone.0097454>
8. Marin F, Le Roy N, Marie B, [Ramos-Silva P](#), Bundelleva I, Guichard N, Immel F. Metazoan calcium carbonate biomineralizations: macroevolutionary trends—challenges for the coming decade. *Bulletin de la Société Géologique de France*, 2014; 185(4):217-32. <https://doi.org/10.2113/gssgfbull.185.4.217>
9. Marie B, [Ramos-Silva P](#), Marin F, Marie A. Proteomics of CaCO₃ biomineral-associated proteins: how to properly address their analysis. *Proteomics*, 2013; 13(21):3109-16. <https://doi.org/10.1002/pmic.201300162>
10. [Ramos-Silva P](#), Kaandorp J, Huisman L, Marie B, Zanella-Cléon I, Guichard N, Miller DJ, Marin F. The skeletal proteome of the coral *Acropora millepora*: the evolution of calcification by co-option and domain shuffling. *Molecular Biology and Evolution*, 2013; 30(9):2099-112. <https://doi.org/10.1093/molbev/mst109>

11. Marie B, Jackson DJ, Ramos-Silva P, Zanella-Cléon I, Guichard N, Marin F. The shell-forming proteome of *Lottia gigantea* reveals both deep conservations and lineage-specific novelties. The FEBS Journal, 2013; 280(1):214-32. <https://doi.org/10.1111/febs.12062>
12. Ramos-Silva P, Benhamada S, Le Roy N, Marie B, Guichard N, Zanella-Cléon I, Plasseraud L, Corneillat M, Alcaraz G, Kaandorp J, Marin F. Novel molluscan biomineralization proteins retrieved from proteomics: a case study with Upsalin. ChemBioChem, 2012; 13(7):1067-78. <https://doi.org/10.1002/cbic.201100708>

Letters and reports

13. Ramos-Silva P, Brito PH, Serrano M, Henriques AO, Pereira-Leal JB. Rethinking the niche of upper-atmosphere bacteria: draft genome sequences of *Bacillus aryabhattai* C765 and *Bacillus aerophilus* C772, isolated from rice fields. Genome Announcements, 2015; 3(2): e00094-15. PubMed <https://doi.org/10.1128/genomeA.00094-15>
14. Ramos-Silva P, Marin F, Kaandorp J, Marie B. Biomineralization toolkit: the importance of sample cleaning prior to the characterization of biomineral proteomes. Proceedings of the National Academy of Sciences USA, 2013; 110(24):E2144-6. <https://doi.org/10.1073/pnas.1303657110>

Book chapters

15. Deutekom ES, Konglerd P, Ramos-Silva P, Kaandorp JA. From Molecules to Morphologies, a Multiscale Modeling Approach to Unravel the Complex System of Coral Calcification. The Cnidaria, Past Present and Future, Springer, 2016; pp 223-36. https://doi.org/10.1007/978-3-319-31305-4_14
16. Ramos-Silva P, Marin F. Proteins as functional units of biocalcification - an overview. Biomineralization: From Fundamentals to Biomaterials and Environmental Issues, Key Engineering Materials, 2016; 672:183-90. <https://doi.org/10.4028/www.scientific.net/KEM.672.183>
17. Le Roy N, Jackson DJ, Marie B, Ramos-Silva P, Marin F. Carbonic anhydrase and metazoan biocalcification: a focus on molluscs. Biomineralization: From Fundamentals to Biomaterials and Environmental Issues, Key Engineering Materials, 2016; 672:151-157. <https://doi.org/10.4028/www.scientific.net/KEM.672.151>
18. Marin F, Le Roy N, Marie B, Ramos-Silva P, Wolf S, Benhamada S, Guichard N, Immel F. Synthesis of Calcium Carbonate Biological Materials: How Many Proteins are Needed? Bioceramics 25, Key Engineering Materials, 2014; 614:52-61. <https://doi.org/10.4028/www.scientific.net/KEM.614.52>
19. Marin F, Marie B, Benhamada S, Ramos-Silva P, Le Roy N, Guichard N, Wolf S, Montagnani C, Joubert C, Piquemal D, Saulnier D, Gueguen Y. 'Shellome': proteins involved in mollusc shell biomineralization - diversity, functions. International Symposium on Pearl Research, Terrapub, 2013; pp 149-16. (Link NA)

TEACHING

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| 11/2020-21 | Guest lecturer in bioinformatics for the course Biological Oceanography, MSc level, University of Amsterdam, The Netherlands (~4 hours) |
| 11/2020-21 | Teaching assistant in laboratory practicals for the course Biological Oceanography, MSc level, University of Amsterdam, The Netherlands (24 hours) |
| 10/2018 | Lecturer of the module Computational Biology and Bioinformatics at the Tirana |

Mathematical and Computational Biology Workshop, Albania (4 hours)

- 07/2014-15 Guest lecturer, journal club coordinator and evaluator of final presentations for the course Research in Bioinformatics, MSc level, University of Lisbon, Portugal (10 hours)
- 01/2014-15 Lecturer of Applied Genetics and Statistics, BSc level, University of the Nouvelle Grand'Anse, Haiti. This teaching was part of a program organized by the NGO Haitian Connection (haitianconnection.org). (140 hours)

SUPERVISION & MENTORING

- 03/2021 - 06/2022 Gloria Casas Canales
MSc Freshwater & Marine Biology, University of Amsterdam
Project: Transcriptomic responses of the sub-Antarctic pteropod *Limacina retroversa* to ocean acidification: adults vs juveniles
- 09/2021 - 10/2021 Héloïse Ribot
MSc Science Education and Communication, Utrecht University
Project: "Seashells inspire CO₂ storage" - popular science article
- 05/2020 - 11/2020 Mari-Lee Odendaal
MSc Biology, Wageningen University & Research
Project: Transcriptomic responses of juvenile versus adult shelled heteropods under decreasing ocean pH
- 01/2019 - 09/2019 Jack Smith
MSc Biology, Leiden University
Project: Screening for fast-evolving genes in pteropod species

INVITED TALKS & SEMINARS

- 03/2022 Colloquium Live at Tribune, Naturalis Biodiversity Center, Leiden, The Netherlands
- 03/2022 Marine Genomics & Evolution Symposium, Naturalis Biodiversity Center, Leiden, The Netherlands
- 07/2019 Meeting: Understanding biomineralisation and the impact of global change in marine organisms, Institute for Advanced Study, Amsterdam, The Netherlands
- 10/2018 Tirana Mathematical and Computational Biology Workshop, Tirana, Albania,
- 10/2013 Research Seminar, Thomas E. Starzl Transplantation Institute, University of Pittsburgh, USA

CONFERENCE TALKS

- 06/2022 Meeting of the Netherlands Society for Evolutionary Biology, Ede, The Netherlands
- 03/2022 Ocean Sciences Meeting, Hawaii, virtual
- 09/2019 15th International Symposium on Biomineralization, Munich, Germany
- 04/2019 Poster pitch at The Conference of the Netherlands Society for Evolutionary Biology, Ede, The Netherlands
- 08/2013 12th International Symposium on Biomineralization, Freiberg, Germany
- 08/2013 5th Meeting - COST Action Biomineralix, Bologna, Italy
- 09/2012 4th Meeting - COST Action Biomineralix, Aarhus, Denmark
- 02/2011 Biomintec International Workshop - Molecular Biomineralization in Marine Organisms: Nanobiotechnology and Biomedical Applications, Palermo, Italy,
- 06/2010 French Conference on Biology of the Mineralized Tissues (12^{èmes} JFBTM), Saint Étienne, France
- 04/2010 7th International Symposium on Networks in Bioinformatics (ISNB 2010), Amsterdam, The Netherlands

CONFERENCE POSTERS

- 09/2019 Pearls of Wisdom: synergising leadership and expertise in molluscan genomics, Kavli Royal Society Centre, Chicheley Hall, UK
- 05/2019 NWO Life Congress, Bunnik, The Netherlands
- 04/2019 Meeting of the Netherlands Society for Evolutionary Biology, Ede, The Netherlands
- 08/2017 16th Congress of the European Society for Evolutionary Biology, Groningen, The Netherlands
- 12/2010 Euro ISRS symposium, Wageningen, The Netherlands
- 07/2010 French Conference on Biology, Computer Science and Mathematics (JOBIM 2010), Montpellier, France

PERSONAL GRANTS

- 02/2019 Marie Skłodowska-Curie Individual Fellowship
Project: EPIC - Evolution of planktonic gastropod calcification,
Grant No.: 844345
Funding Source: European Commission
Amount and duration: 176k €, 2.5 years
Host: Naturalis Biodiversity Center

- 02/2015 Postdoctoral Fellowship
Project: EvoSpore - Understanding the evolutionary history and the diversity of bacterial endosporeulation
Funding Source: Portuguese Foundation for Science and Technology – FCT
Grant No.: SFRH/BPD/103171/2014
Amount and duration: 55k €, 3 years
Host: Instituto Gulbenkian de Ciência

AWARDS

- 01/2019 Malacological Society of London Travel Award, UK (300 £)
- 05/2017 2nd Martin Fellowship, Naturalis Biodiversity Center, The Netherlands (2700 €)
- 10/2016 1st Martin Fellowship, Naturalis Biodiversity Center, The Netherlands (1300 €)
- 07/2013 Scholarship from the National Institutes of Health & Howard Hughes Institute for the course Frontiers in Stem Cells & Regeneration, USA (2500 \$)

CERTIFICATIONS & TRAINING

In bioinformatics

- 03/2022 Genome Assembly and Annotation, physalia-courses.org (online)
- 11/2021 Ecological and Evolutionary Studies on DNA Methylation in Plants and Animals, physalia-courses.org (online)

I participated in six intensive courses organized by The Gulbenkian Training Program in Bioinformatics (gtpb.igc.gulbenkian.pt):

- 04/2018 Analysis of Differential Expression with RNAseq
- 04/2017 Advanced Biostatistics for Bioinformatics Tool Users using R
- 03/2017 Population Genetics and Demographic History: model-based approaches
- 03/2016 NGS Data Analysis, RNAseq, ChIPseq
- 11/2014 Bioinformatics using Python for Biologists
- 10/2014 Transcriptome Analysis, Automatic Function Annotation and Data Mining

Others

- 04/2022 Didactical modules 1-3 and 6, Teaching and Learning Centre FNWI, University of Amsterdam
- 11/2020 EMBO Lab Leadership course for Postdocs, embo.org (online)
- 09/2013 Frontiers in Stem Cells & Regeneration, Marine Biological Laboratory, Woods Hole, MA, USA

PEER-REVIEW SERVICES

Scientific Reports, Frontiers in Genetics, Genome Biology and Evolution, Journal of Proteome Research, Plos One, F1000Research

OUTREACH

- 09/2022 Naturalis Spotlight: ‘The amazing shells of sea butterflies’ at the museum LiveScience
- 09/2021 [Promotional video](#) of the publication Evolution and biomineralization of pteropod shells
- 08/2019 “Shell microstructures of planktonic gastropods” in the Bulletin of The Malacological Society of London Nr 73, The Malacologist (ISSN 1759-1406)
- 2014-17 Science communication at the annual NOS Alive Music Festival with microscope demonstrations and one-on-one speed dates about what is computational biology, bioinformatics, genes and evolution, Lisbon, Portugal
- 10/2016 Open Day at the Instituto Gulbenkian de Ciência - I participated in this event by creating an interactive game introducing evolutionary thinking to children and teenagers named “How are animals related?”, Oeiras, Portugal
- 01/2015 Presenting ‘A mobility experience’ to share my experience living and working abroad as a scientist to the students of the University of Trás-os-Montes and Alto Douro (UTAD), during the EURAXESS Roadshow in Vila Real, Portugal
- 09/2012 Radio interview “Portuguese in the World”, Antena 1 to share my experience abroad and explain my research in biomineralization, Amsterdam, The Netherlands

ACADEMIC SERVICES

- 2021-22 Manager of the high memory server for the Plankton Diversity and Evolution group at Naturalis. Tasks: bridge between researchers and IT unit, maintain system up to date, write documentation install/update software, manage user accounts, technical support to users
- 2017-18 Manager of the high memory server from the Computational Genomics Laboratory at Instituto Gulbenkian de Ciência. Tasks: maintain system up to date, install software, manage user accounts, technical support to users
- 2014-15 Postdoc Committee member, Instituto Gulbenkian de Ciência, Portugal
Main roles:
 - Organizer of the monthly Careers in Science Seminar Series.
 - Organizer of 2nd Annual Joint Postdoctoral Meeting, Setúbal, Portugal, November 4-6, 2015 with approx. 100 participants
 - Postdoc representative for different organizations

LANGUAGES

Portuguese (native), English (full - C2*), French (full – C2*), Dutch (limited – B1*)

* Levels according to the Common European Framework of Reference