

Miguel Méndez Sandín, Ph.D.

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Born	1990/09/07, in Gijón, Asturias, Spain	
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	Lead coordinator of "The Life of Retaria Seminar Series": thelifeofretaria.github.io/	

Professional experience

2024/09/01 - 2026/08/31	Marie Skłodowska-Curie Actions Postdoctoral Fellow , Institute of Evolutionary Biology, CSIC - UPF, Spain <i>Hosts:</i> Daniel J. Richter and Ramon Massana <i>Project:</i> The hidden majority: high-resolution imaging and genomics of the most ecologically important microbial eukaryotes in the ocean
2023/03/01 - 2024/08/31	Beatriu de Pinós Postdoctoral Fellow , Institute of Evolutionary Biology, CSIC - UPF, Spain <i>Hosts:</i> Daniel J. Richter and Ramon Massana <i>Project:</i> The hidden majority: high-resolution imaging of the most ecologically important microbial eukaryotes in the ocean
2022/09/08 - 2023/02/28	Parental leave
2020/09/15 - 2022/09/07	Postdoctoral researcher , Dept. of Organismal Biology, Uppsala University, Sweden <i>Advisor:</i> Fabien Burki <i>Project:</i> Eco-evolution of microbial eukaryotes, insights from metabarcoding surveys <i>Experience:</i> Diversification analysis, networks analysis, large data mining, lecturer, workshop organisation, fluorescence in situ hybridization
2016/10/01 - 2019/11/30	Ph.D. Student , Biological Station of Roscoff, CNRS - Sorbonne University, France <i>Supervisor:</i> Fabrice Not <i>Project:</i> Diversity and Evolution of Nassellaria and Spumellaria (Radiolaria) <i>Experience:</i> Single-cell molecular approaches, phylogenetics, molecular clock, metabarcoding and next generation sequencing analysis, scanning electron and confocal microscopy, student supervision
2016/03/01 - 05/31	Research assistant , Biological Station of Roscoff - Sorbonne University, France <i>Supervisor:</i> Sophie Martin <i>Project:</i> Impact of global and local changes in Maerl, red algae <i>Experience:</i> Experimental development
2015/10/05 - 2016/01/29	Research assistant , Oviedo University, Spain <i>Supervisor:</i> Eva Garcia-Vazquez <i>Project:</i> Top-down regulation in freshwater communities suggested from environmental DNA. A case study in mountain stream communities <i>Experience:</i> Field work, environmental DNA sampling and analysis
2015/01/12 - 06/30	Master thesis , Oviedo University, Spain <i>Supervisor:</i> Consolación Fernández <i>Project:</i> Long-term changes in low intertidal rocky shore assemblages in the coast of Cape Peñas (North of Spain). <i>Experience:</i> Multivariate analysis

Education

2016/10/01 - 2019/11/31	Ph.D. in molecular diversity and evolution , Biological Station of Roscoff - Sorbonne University, France. <i>Supervisor: Fabrice Not.</i> Awarded on November 22, 2019
- 2019/01/28 - 02/09	Visiting scientist: Institute of Marine Science, CSIC, Barcelona (Spain)
- 2018/10/15 - 12/07	Visiting scientist: National Institute of Water and Atmospheric Research, Wellington (New Zealand)
- 2017/10/30 - 11/03	Visiting scientist: Tropical Biosphere Research Center, Okinawa (Japan)
- 2016/10/05 - 10/28	Visiting scientist: Oceanographic Observatory of Villefranche sur Mer, CNRS (France)
2013/09/02 - 2015/06/30	International MSc in Marine Biodiversity and Conservation (EMBC+)
- 2015/01/12 - 06/30	Oviedo University, Spain. Master Thesis. <i>Supervisor: Consolación Fernández</i>
- 2014/09/01 - 12/19	Sorbonne University, France
- 2014/04/07 - 04/18	Gothenburg University, Sweden. Spring School. <i>Supervisor: Rick Officer</i>
- 2013/09/02 - 2014/06/27	Algarve University, Portugal
2008/09/29 - 2013/06/04	BSc in Biology , Ecology speciality. 311 ECTS. Oviedo University, Spain
- 2013/01/14 - 07/31	Student intern: Ecology department. <i>Supervisor: Jose Luis Acuña</i>
- 2012/09/03 - 12/21	ERASMUS: Klaipeda University, Lithuania
2006/09/04 - 2008/06/31	International Baccalaureate , IES Real Instituto de Jovellanos, Gijón, Spain

Fellowships and grants

2024	CGUE 2024 conference, child support award: 605€
2023	Marie Skłodowska-Curie Actions - Postdoctoral Fellowship (MSCA-2022-PF 101103530): 181 152.96 € (2 years); score: 98.6%
2022	Postdoctoral fellowship Beatriu de Pinós (2021 BP 00068): 144 300 € (3 years); score: 87.3%
2024/10	CGUE 2024 conference, child support award : 605€
2022/05/10	International Society Of Protistologists (ISOP) grant to attend Protistology Nordics
2017/05/15	Young Research Association (AJC, Biological Station of Roscoff) grant to attend InterRad XV, France
2016 - 2019	<i>Agence Nationale de la Recherche</i> (ANR) and the Brittany Region Grants, France, to carry out doctoral studies (PhD)
2008 - 2013	Scholarship to study BSc from the National Ministry of Education, Spain

Awards and honors

2024	<i>Qualification</i> - Section 67 (<i>Biologie des populations et écologie</i>): Qualified to become a university teacher by the Minister of Higher Education and Science, France
2020/01/22	Best oral presentation award in Young Researchers Day (JJC) Biological Station of Roscoff, France
2019	The Micropalaeontological Society: Microfossil Image Competition & Calendar 2019
2018/12/07	3rd best oral presentation award in Young Researchers Day (JJC) Biological Station of Roscoff, France
2017/10/24	Best oral presentation for Young Scientists in InterRad XV, Japan

Skills and qualifications

Languages	Spanish: Native English: Working knowledge French: Conversational Portuguese: Basics	Softwares	LibreOffice: Extensive experience Inkscape: Advanced FIJI and GIMP: User-level
Programming	R and python: Advanced Bash, UNIX/LINUX: Intermediate HTML & CSS: Basics	Driving licence	B
		Diving	GUE fundamentals (Nitrox 32) SSI advanced and scientific

Expeditions & Fieldworks

2018/10/21 - 11/21	TAN1810 expedition, 5 weeks, <i>Tangaroa</i> Ocean Research Vessel, New Zealand
2017/09/11 - 09/24	Bio-MOOSE expedition, 2 weeks, <i>L'atalante</i> Ocean Research Vessel, France
2013/04/28 - 05/04	BioCant 3 expedition, 1 week, <i>Sarmiento de Gamboa</i> Ocean Research Vessel, Spain

Professional training

2019/06/24 - 06/28	Evolutionary Networks, AIRE Team, Sorbonne University
2018/05/14 - 05/18	Metabarcoding Analysis, IFREMER
2018/18/01 - 19/01	Data Management With Python, ABiMS, Biological Station of Roscoff
2017/05/16 - 05/17	Advanced Linux, ABiMS, Biological Station of Roscoff
2017/03/02	Advanced R Language, ABiMS, Biological Station of Roscoff
2017/03/06 - 03/10	Phylogenetic Analysis Using R, Barcelona
2015/11/27 - 12/06	International Summer School: New challenges for research in biodiversity and ecology of micro- and macro-algae. ECIM, Las Cruces, Chile
2015/01/19 - 03/14	Statistical Online Course: Statistical Learning. Stanford University
2013/10/02 - 2014/04/14	Diving: GUE Fundamentals (Nitrox 32), Advanced & scientific diver 1 (SSI)

Teaching

2024/12/12	Invited speaker: 1.5 hours: Phylogenetic analyses and tree thinking, Biological Station of Roscoff, France. "Data analysis meetings"
2022/04/06	Lecturer: 2.5 hours: Diversity of single-celled marine eukaryotes, Uppsala University, Sweden. Bachelor students year 1
2021/11/29 - 12/03	Invited teacher assistant: 30 hours. Novel methods for exploring molecular microbial diversity: long-read sequencing. Masters " <i>Océanographie et Environnements Marins</i> " (OEM), Biological Station of Roscoff, France
2021/04/15	Lecturer: 1.5 hours: Diversity of single-celled marine eukaryotes, Uppsala University, Sweden. Bachelor students year 1
2021/01/19	Organiser and lecturer: 8 hours: An introduction to Sequence Similarity Networks, Uppsala University, Sweden. Systematic Biology
2018/04/12 - 04/13	Teacher assistant: 12 hours. Single-cell molecular approaches for studying mixotrophs, Biological Station of Roscoff, France. MixITin MSCA-ITN
2017/11/20 - 11/24	Teacher assistant: 30 hours. Marine MICROorganisms: MOlecular approaches to their taxonomic and functional diversity (MICROMOL). Masters " <i>Océanographie et Environnements Marins</i> " (OEM) and " <i>Marine Biodiversity and Conservation</i> " (EMBC), Biological Station of Roscoff, France

Supervision

2024/04 - 2024/09	<u>Natalia Morales</u> , Master thesis: Integrating DNA sequencing and oceanographic simulations to trace the origins of planktonic communities in the Caribbean Sea. Master: " <i>Oceanografía y Gestión del Medio Marino</i> ", Barcelona University, Spain PDF accessible via digital.CSIC: http://hdl.handle.net/10261/394488
2022/03/31	<u>Thomas M. Huber</u> , Master thesis: Little big data - extending plastid genome databases using marine planktonic metagenomes. Master: Erasmus Mundus Master Programme in Evolutionary Biology, Uppsala University, Sweden. Opponent
2018/01/08 - 06/18	<u>Elsa Gadoïn</u> , Master thesis: Molecular diversity of microalgae in symbiosis with Nassellaria and Spumellaria (Radiolaria). Master: " <i>Océanographie et Environnements Marins</i> ", Sorbonne University, France

Outreach

2025/05/22	<i>Entrevista con un biólogo</i> : 6-8 years old students, CRA Les Mariñes, Asturias, Spain
2021/10/01 - 10/11	<i>Fête de la Science</i> : interactive poster: Rhizaria (Ocean Touch), Brest, France
2020/02/13	Introducing biodiversity and DNA to high-school students, Morlaix, France
2019/10/06	<i>Fête de la Science</i> : Introducing plankton to the public, Morlaix, France
2017/10/15	<i>Fête de la Science</i> : Introducing plankton to the public, Roscoff, France

Scientific services

Reviewer of [Deep-Sea Research](#), [Journal of Plankton Research](#), [ISME](#), [Molecular Ecology Resources](#), [PNAS](#) and [Protist](#) since 2020, and *recommender* in [PCI microbiol](#).

Expert curator of PR2, Radiolaria: [pr2-database.org/team/](#)

Lead organiser of The Life of Retaria Seminar Series: [thelifeofretaria.github.io/](#)

Software contributor in GitHub: [github.com/MiguelMSandin](#)

Online scientific output

A total of 16 Silhouettes of Radiolaria available to the public domain for further presentations, manuscripts and outreach purposes: available at [phylopic.org/](#)

A tool for the high throughput design of specific oligonucleotides: [github.com/MiguelMSandin/oligoN-design](#)

An introduction to Sequence Similarity Networks: [github.com/MiguelMSandin/SSNetworks](#)

A practical guide to phylogenetic analyses: [miguelmsandin.github.io/phylogeniesQuickStart](#)

A set of scripts and functions to deal with common DNA fasta files and phylogenetic trees through the command line:[github.com/MiguelMSandin/random](#)

A tool to estimate the entropy of a multiple sequence alignment (published in Sandin et al., 2021)
[github.com/MiguelMSandin/DNA-alignment-entropy](#)

A wet-laboratory protocol for single-cell rDNA amplification of Nassellaria (doi: [10.17504/protocols.io.t5req56](#)) and Spumellaria (doi: [10.17504/protocols.io.xwvfpe6](#))

A protocol for cleaning and staining of radiolaria skeletons to be imaged in a confocal microscope (doi: [10.17504/protocols.io.t5qeq5w](#))

A protocol for scanning electron microscopy imaging of opaline silica single-cell skeletons (Polycystine Radiolaria: doi: [10.17504/protocols.io.ug9etz6](#))

Conferences

- 2025/09/29 Symposium on Aquatic Microbial Ecology (SAME18), Barcelona, Spain
Poster: “*OligoN-design: A simple and versatile tool to design specific probes and primers from large heterogeneous datasets*”
- 2025/09/24 17th InterRad congress, Florence, Italy
Round table chair: “*Molecular biology for studying diversity, ecology and evolution*”
Talk: “*Is the gelatinous matrix of Nassellaria a strategy for coping with oligotrophy?*”
- 2025/06/23 16th International Congress of Protistology, ICOP-ISOP joint meeting, Seoul, South Korea
Invited talk: “*Revealing the diversity and evolution of Radiolaria beyond the stars of the ocean*”
- 2024/10/02 Comparative genomics of unicellular eukaryotes (CGUE): Interactions and symbioses, Sant Feliu de Guixols, Spain
Talk: “*Environmental phylogenetics reveals early diversification of crown eukaryotes in the Mesoproterozoic*”
- 2023/07/11 IX European Congress of Protistology, ECOP-ISOP joint meeting, Vienna, Austria
Talk: “*The early evolutionary history of microbial eukaryotes and the unknown diversity*”
- 2023/07/05 Jornada de Biología Evolutiva, Barcelona, Spain
Talk: “*The early evolutionary history of microbial eukaryotes and the unknown diversity*”
- 2023/01/20 International Society for Evolutionary Protistology, Virtual Meeting
Talk: “*The eco-evolution of microbial eukaryotes: insights from molecular environmental surveys*”
- 2022/09/13 16th InterRad congress, Ljubljana, Slovenia
Talk: “*Radiolaria diversity, ecology and evolution: an integrative approach*” (Presented by Fabrice Not)
- 2022/05/10 Protistology Nordics, Natural History Museum of Oslo, Norway
Talk: “*Biotic interactions driving early eukaryotic evolution*”
- 2020/01/22 Young Researchers Day, Biological Station of Roscoff, France
Talk: “*Diversity and evolution of Radiolaria*”
Poster: “*Intra-genomic rDNA gene variability of Nassellaria and Spumellaria (Rhizaria, Radiolaria) assessed by Sanger, MinION and Illumina sequencing*”

- 2019/07/30 VIII European Congress of Protistology, ECOP-ISOP Joint meeting, Rome, Italy
Talk: "Diversity and evolution of Radiolaria"
- 2018/12/07 Young Researchers Day, Biological Station of Roscoff, France
Talk & Poster: "Time Calibrated Morpho-molecular Classification of Nassellaria (Radiolaria)"
- 2017/10/24 15th InterRad congress, Niigata, Japan
Talk: "Time Calibrated Morpho-molecular Classification of Nassellaria (Radiolaria)"
- 2016/12/08 Young Researchers Day, Biological Station of Roscoff, France
Flash-Talk: "Diversity and Evolution of Nassellaria and Spumellaria (Radiolaria)"

Seminars

- 2025/07/16 The Life of Retaria Seminar Series, Online Meeting
Talk: "Calibrating the Retaria molecular clock"
- 2025/01/14 MicrobeHub Seminar, Institute of Evolutionary Biology, Barcelona, Spain
Talk: "Revealing the diversity and evolution of Radiolaria beyond the stars of the ocean"
- 2024/05/10 The Life of Retaria Seminar Series, Online Meeting
Kick-off presentation, on behalf of the organising committee
- 2024/02/22 Ongoing and future research, Institute of Evolutionary Biology, Barcelona, Spain
Flash-talk: "The hidden majority: Exploring environmental DNA to better understand eukaryotic diversity and evolution"
- 2023/09/04 MicrobeHub Seminar, Institute of Evolutionary Biology, Barcelona, Spain
Talk: "Gelatinous matrix, an original strategy to cope oligotrophy in Nassellaria (Radiolaria)"
- 2023/06/19 MicrobeHub Seminar, Institute of Evolutionary Biology, Barcelona, Spain
Talk: "The hidden majority: Exploring environmental DNA to better understand eukaryotic diversity and evolution"
- 2022/06/22 Systematic Biology Seminar Series, Uppsala University, Sweden
Talk: "Biotic interactions driving early eukaryotic evolution"
- 2021/10/21 Systematic Biology Seminar Series, Uppsala University, Sweden
Talk: "Eukaryotic environmental molecular diversity and its eco-evolutionary history"

Publications

Total citations: 521 H-index: 12

Pre-prints

Sandin MM, Cohen P, Morlon H, Burki F (2025) Environmental phylogenetics supports a steady diversification of crown eukaryotes starting from the mid Proterozoic. *bioRxiv* 2025.12.12.693929; doi: [10.64898/2025.12.12.693929](https://doi.org/10.64898/2025.12.12.693929)

Sandin MM, Walde M, Henry N, Forn I, Simon N, Berney C, Massana R, Richter DJ (2025) OligoN-design: A simple and versatile tool to design specific probes and primers from large heterogeneous datasets. *bioRxiv* 2025.11.04.685038 doi: [10.1101/2025.11.04.685038](https://doi.org/10.1101/2025.11.04.685038)

Peer reviewed publications

Trubovitz S, **Sandin MM**, Caron DA (2025) Genetic variability in microbial eukaryotes reframes marine biodiversity assessment in the age of amplicon sequencing. *PLoS One.* 20(6): e032605. doi: [10.1371/journal.pone.0326053](https://doi.org/10.1371/journal.pone.0326053)

Sandin MM, Renaudie J, Suzuki N, Not F (2025) Diversity and evolution of Radiolaria: Beyond the stars of the ocean. *Current Biology.* 35, 2524–2538. doi: [10.1016/j.cub.2025.04.032](https://doi.org/10.1016/j.cub.2025.04.032)

Llopis-Monferrer N, Romac S, Laget M, Nakamura Y, Biard T, **Sandin MM** (2025) Gelatinous matrix, an original strategy to cope with oligotrophy in Nassellaria (Radiolaria). *Environ. Microbiol.* 27 (5), e70098. doi: [10.1111/1462-2920.70098](https://doi.org/10.1111/1462-2920.70098)

Llopis-Monferrer N, Biard T, **Sandin MM**, Lombard F, Picheral M, Elineau A, Guidi L, Leynaert A, Tréguer PJ, Not F (2022) Siliceous Rhizaria abundances and diversity in the Mediterranean Sea assessed by combined imaging and metabarcoding approaches. *Front. Mar. Sci.* 9:895995. doi: [10.3389/fmars.2022.895995](https://doi.org/10.3389/fmars.2022.895995)

Sandin MM, Romac S, Not F (2022) Intra-genomic rDNA gene variability of Nassellaria and Spumellaria (Rhizaria, Radiolaria) assessed by Sanger, MinION and Illumina sequencing. *Environ Microbiol.* 24(7):2979-2993. doi: [10.1111/1462-2920.16081](https://doi.org/10.1111/1462-2920.16081)

Xiao L, Johansson S, Rughöft S, Burki F, **Sandin MM**, Tenje M, Behrendt L (2022) Photophysiological response of Symbiodiniaceae single cells to temperature stress. *ISME J* doi: [10.1038/s41396-022-01243-6](https://doi.org/10.1038/s41396-022-01243-6)

Burki F, **Sandin MM**, Mahwash J (2021) Diversity and ecology of protists revealed by metabarcoding. *Curr. Biol.* 31-19: R1267-R1280. doi: [10.1016/j.cub.2021.07.066](https://doi.org/10.1016/j.cub.2021.07.066)

Sandin MM, Biard T, Romac S, O'Dogherty L, Suzuki N, Not F (2021) A Morpho-molecular Perspective on the Diversity and Evolution of Spumellaria (Radiolaria). *Protist*. 172, 125806. doi: [10.1016/j.protis.2021.125806](https://doi.org/10.1016/j.protis.2021.125806)

Llopis-Monferrer N, Boltovskoy D, Tréguer P, **Sandin MM**, Not F, Leynaert A (2020) Estimating biogenic silica production of Rhizaria in the global ocean. *Global Biogeochemical Cycles*, 34, e2019GB006286. doi: [org/10.1029/2019GB006286](https://doi.org/10.1029/2019GB006286)

Nakamura Y, **Sandin MM**, Suzuki N, Somiya R, Tuji A, Not F (2020) Phylogenetic revision of the order Entactinaria—Paleozoic relict Radiolaria (Rhizaria, SAR). *Protist* 171. Doi: [10.1016/j.protis.2019.125712](https://doi.org/10.1016/j.protis.2019.125712)

Qui-minet ZN, Coudret J, Davoult D, Grall J, Cariou T, **Sandin MM**, Martin S (2019) Combined effects of global climate change and nutrient enrichment on the physiology of three temperate maerl species. *Ecol.* 00, 1–21. doi: [10.1002/ece3.5802](https://doi.org/10.1002/ece3.5802)

Sandin MM, Pillet L, Biard T, Poirier C, Bigeard E, Romac S, Suzuki N, Not F (2019) Time Calibrated Morpho-molecular Classification of Nassellaria (Radiolaria). *Protist* 170, 187–208. doi: [10.1016/j.protis.2019.02.002](https://doi.org/10.1016/j.protis.2019.02.002) (Journal cover)

Villar E, Dani V, Bigeard E, Linhart T, **Sandin MM**, Bachy C, Six C, Lombard F, Sabourault C, Not F (2018) Symbiont Chloroplasts Remain Active During Bleaching-Like Response Induced by Thermal Stress in Collozoum pelagicum (Collodaria, Retaria). *Front. Mar. Sci.* 5, 1–11. doi: [10.3389/fmars.2018.00387](https://doi.org/10.3389/fmars.2018.00387)

Fernandez S, **Sandin MM**, Beaulieu PG, Clusa L, Martinez JL, Ardura A, García-Vázquez E (2018) Environmental DNA for freshwater fish monitoring: insights for conservation within a protected area. *PeerJ* 6 e4486. doi: [10.7717/peerj.4486X](https://doi.org/10.7717/peerj.4486X)

Sandin MM, Fernández C (2016) Changes in the structure and dynamics of marine assemblages dominated by Bifurcaria bifurcata and Cystoseira species over three decades (1977-2007). *Estuar. Coast. Shelf Sci.* 175, 46–56. doi: [org/10.1016/j.ecss.2016.03.015](https://doi.org/10.1016/j.ecss.2016.03.015)

PhD thesis

Sandin MM. Diversity and Evolution of Nassellaria and Spumellaria (Radiolaria). Protistology. Sorbonne Université, 2019. PhD Thesis. HAL Id: [tel-03137926](https://tel.archives-ouvertes.fr/tel-03137926)

Other publications

Sandin MM, Renaudie J, Suzuki N, Not F (2025) Response to “Radiolarian evolution: Analytical challenges in estimating the diversity and origin of Nature’s stars”. *EcoEvoRxiv* doi: [10.32942/X2V359](https://doi.org/10.32942/X2V359)