

## CHARLES BACHY

### Contact information

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### EDUCATION AND POSITIONS

2016-present

**Marie Skłodowska-Curie fellow** at the Station Biologique de Roscoff (SBR), France. UMR7144, DIPO team, in collaboration with Fabrice Not. *Characterization of the diversity and function of plankton associated microbiota (DYNAMO)*.

2013-2016

**Postdoctoral fellow** at the Monterey Bay Aquarium Research Institute (MBARI), Moss Landing, California. Research & Development, Molecular microbial ecology group, Alexandra Z. Worden lab. *Transcriptomics, phylogenomics and virus ecology of the marine microbial eukaryotes*.

2008-2012

**Ph.D in Microbiology**. University of Paris-Sud, Orsay. Laboratory of Ecology, Systematics and Evolution, under supervision of David Moreira and Purificación López-García. *Phylogeny, diversity and temporal dynamics of marine tintinnid ciliates*.

2006-2008

**Master of Science in Oceanography and Marine Environments**. University Pierre et Marie Curie, Paris. Department of Sciences of the Universe, Environment and Ecology.

### INTERNATIONAL PRESENTATIONS AND CONFERENCES

#### ORAL presentations and session organization:

- 2015 CIFAR Integrated Microbial Biodiversity Program Meeting -Victoria, Canada: *“Global host-virus transcriptomic profile”*.
- 2014 International Society for Microbial Ecology - Seoul, Korea. Invited oral session: *“How biochemical pathway gaps can reveal growth requirements of dominant taxa in the surface ocean”* and Contributed oral session: *“Discovery of a photosensory signaling protein widespread in algae”*.
- 2014 ASLO Ocean Sciences Meeting, Honolulu, Hawaii, USA.  
Session organizer (co-chaired with Alexandra Z. Worden) - *Aquatic microbial eukaryotes: from genomes to ecosystems*.
- 2012 International Society for Microbial Ecology - Copenhagen, Denmark: *“Accuracy of protist diversity assessments”*
- 2011 Symposium on Aquatic Microbial Ecology - Rostock, Germany: *“Morphological versus molecular-based diversity surveys of planktonic microbial eukaryotes: the case of tintinnid ciliates”*

POSTER presentations:

- 2016 International Society for Microbial Ecology - Montréal, Canada.:  
*“Quantitative assessment of the green alga Micromonas in Arctic phytoplankton communities”*
- 2015 Jacques Monod Conference Marine Eco-system Biology - Roscoff, France:  
*“Global host-virus transcriptomic profile”*
- 2015 Genomics of Energy & Environment Meeting (JGI-DOE) - Walnut Creek, USA:  
*“Differential gene expression in the viral infection of the marine alga Micromonas pusilla under nutrient limitation”*
- 2015 Western Photosynthesis Meeting - Asilomar, USA: *“Global and photosynthesis-related gene expression in the marine alga Micromonas pusilla”*
- 2014 ASLO Ocean Sciences Meeting, Honolulu - Hawaii, USA: *“Phytochromes in widespread marine algae reveal origins of plant signaling proteins”*
- 2014 Genomic Science Annual Contractor-Grantee Meeting - Washington DC, USA:  
*“Phytochromes in photosynthetic algae reveal origins of plant signaling proteins”*
- 2014 Genomic Science Annual Contractor-Grantee Meeting - Washington DC, USA:  
*“Phytochromes in photosynthetic algae reveal origins of plant signaling proteins”*
- 2010 British Society of Protist Biology-ISOP joint meeting - Canterbury, United Kingdom: *“Merging molecular phylogeny and classical taxonomy of tintinnid ciliates”* – Prize of best poster.
- 2010 Symposium on Aquatic Microbial Ecology - Piran, Slovenia: *“Diversity and vertical distribution of microbial eukaryotes in the snow, sea ice and marine waters from North Pole”*

Ad Hoc Reviewer for: Environmental Microbiology, Protist, Scientific Reports, Zoologica Scripta, Journal of Eukaryotic Microbiology, Biogeosciences.

**PUBLICATION LIST****2017**

Choi CJ,\* **Bachy C**,\* Spiro Jaeger G, Poirier C, Sudek L, Sarma V.V.S.S., Mahadevan A, Giovannoni SJ, Worden AZ. (2017) Newly Discovered Deep-Branching Marine Plastid Lineages Are Numerically Rare but Globally Distributed. **Current Biology** 27(1):R15-16

\* These authors contributed equally

Caron DA, Alexander H, Allen AE, Archibald JM, Armbrust EV, **Bachy C**, Bell CJ, et al. (2017) Probing the Evolution, Ecology and Physiology of Marine Protists Using Transcriptomics. **Nature Reviews Microbiology** 15(1):6-20

**2016**

van Baren MJ, **Bachy C**, Reistetter E, Purvine SO, Grimwood J, Sudek S, Yu H, Poirier C, Deerinck TJ, Kuo A, Grigoriev IV, Wong CH, Smith RD, Callister SJ, Wei CL, Schmutz J, Worden AZ (2016) Evidence-based green algal genomics reveals marine diversity and ancestral characteristics of land plants. **BMC Genomics** 17:267

Santoferrara LF, **Bachy C**, Alder VA, Gong J, Kim YO, Saccà A, da Silva Neto ID, et al. (2015) Updating Biodiversity Studies in Loricata Protists: The Case of the Tintinnids (Alveolata, Ciliophora, Spirotrichea). **Journal of Eukaryotic Microbiology** 63(5):651-6

## 2015

Simmons M,\* **Bachy C**,\* Sudek S, van Baren MJ, Sudek L, Ares M, Worden AZ (2015) Intron invasions trace algal speciation and reveal nearly identical Arctic and Antarctic *Micromonas* populations. **Molecular Biology and Evolution** 32 (9):2219-2235

\* These authors contributed equally

Dunthorn M, Lipps JH, Dolan JR, Saab MAA, Aesch E, **Bachy C** et al. (2015) Ciliates—Protists with complex morphologies and ambiguous early fossil record. **Marine Micropaleontology** 119:1-6

## 2014

Duanmu D,\* **Bachy C**,\* Sudek S, Wong CH, Jimenez V, Rockwell NC, Martin SS, Ngan CY, Reistetter E, van Baren MJ, Price DC, Wei CL, Reyes-Prieto A, Lagarias JC, Worden AZ (2014) Marine Algae and Land Plants Share Conserved Phytochrome Signaling Systems. **Proceedings of the National Academy of Sciences** 111(44):15827–15832

\* These authors contributed equally

**Bachy C** and Alexandra Z. Worden (2014) Microbial Ecology: Finding Structure in the Rare Biosphere. **Current Biology** 24(8):R315-17

Rockwell NC, Duanmu D, Martin SS, **Bachy C**, Price DC, Bhattacharya D., Worden AZ, Lagarias JC (2014) Eukaryotic algal phytochromes span the visible spectrum. **Proceedings of the National Academy of Sciences** 111(10):3871–3876

Dolan JR, Pierce RW, **Bachy C** (2014) *Cyrtarocylis ampulla*, a Polymorphic Tintinnid Ciliate of the Marine Plankton. **Protist** 165(1):66–80

**Bachy C**, Moreira D, Dolan JR, López-García P (2014) Seasonal dynamics of free-living tintinnid ciliate communities revealed by environmental sequences from the North-West Mediterranean Sea. **FEMS microbiology ecology** 87(2):330-342

## 2013

**Bachy C**, Dolan JR, López-García P, Deschamps P, Moreira D (2013) Accuracy of protist diversity assessments: morphology compared to cloning and direct pyrosequencing of 18S rRNA genes and ITS regions using the conspicuous tintinnid ciliates as a case study. **ISME Journal** 7(2):244-255

## 2012

**Bachy C**, Gómez F, López-García P, Dolan JR, Moreira D (2012) Molecular Phylogeny of Tintinnid Ciliates (Tintinnida, Ciliophora). **Protist** 163(6):873-887

## 2011

**Bachy C**, López-García P, Vereshchaka A, Moreira D (2011) Diversity and vertical distribution of microbial eukaryotes in the snow, sea ice and seawater near the North Pole at the end of the polar night. **Frontiers in Microbiology** 2

## 2010

Grimsley N, Pequin B, **Bachy C**, Moreau H, Piganeau G (2010) Cryptic sex in the smallest eukaryotic marine green alga. **Molecular Biology and Evolution** 27(1):47-54

## PROFESSIONAL SOCIETIES

International Society for Microbial Ecology  
 American Society of Limnology and Oceanography  
 Society of Aquatic Microbial Ecology

## SKILLS

**Languages** French (mother tongue)  
 English (current and scientific)  
 Spanish (basic knowledge)

**Computer** **Environments:** Windows, UNIX.  
**Utilities:** MS Office, Adobe suite.  
**Bioinformatics:** Tuxedo suite, EdgeR, BioEdit, MrBayes, MUST, FastTree, Treefinder, PAUP, BEAST, Phylobayes, MEGA, Mesquite, Network, SplitsTree, Arlequin, AmpliconNoise, CD-HIT, Mothur, USEARCH, Unifrac, GSEA, Galaxy, xcms...User of python and Perl scripts.

**Systems biology** DNA and RNA extraction, PCR, qPCR, purification, cloning, Sanger sequencing, primer designing, preparation of amplification products and purification for NGS, metabolite extractions, RACE approach, cDNA library, FISH, DAPI...

## RESPONSABILITIES

Elected member (PhD, Postdocs) in the Ecology, Systematics and Evolution Laboratory Council (2009/2011).

## AWARD AND GRANTS

2016-2018: Marie Skłodowska-Curie grant agreement N°706430 (185000€).  
 2008-2012: *ANR Grants* (PhD) from the Agence Nationale de la Recherche, France.  
 2007-2008: “*Excellence Grant*” for MD students, ‘Bourse au Mérite’, (1800 €).

Outstanding Student Presentation, 2010 Annual Meeting of the International Society of Protistologists in Canterbury, United Kingdom.

## TRAINING COURSES

- Annual Exobiologist students meeting (RED’) in Le Teich, France. University of Bordeaux, 2009.
- “Protists in the biosphere” in Paris, France. National Museum of Natural History, 2010
- Workflow4Metabolomics workshop (W4m) in Roscoff, France. SBR, 2016.

## COMMUNICATION

“Faites de la science”, microscopic workshops with young pupils in May 2010.  
 “Circonvolutions”, CNRS project to teach Darwinian evolution to college students in January 2011.  
 “Open house” at the MBARI, phytoplankton workshop.

## **PROFESIONNAL EXPERIENCE**

Review and selection of hydrobiological models – A modeling approach coupling hydrodynamics and hydrobiology for water resource management. Biological expert's work for Veolia-Water, Research & Innovation department in June/July 2009.