



© W. Thomas/CNRS/Sorbonne Université

Job Offer : 2 Years PostDoc position in marine plankton cell biology and ecology

'Quantitative 3D imaging to assess the diversity, ecology, and ecosystem functions of eukaryotic symbioses across a long-term marine plankton time series'

Employer: Sorbonne University, France

Work location: Station Biologique de Roscoff (SBR, <http://www.sb-roscoff.fr>)

Department & Team : UMR 7144, ECOMAP - Ecology of Marine Plankton

Duration: 24 months, with possibility of extension through CNRS

Salary : 2,500 € per month (net salary)

Deadlines (2019) : Application: March 30th; candidates interview and selection: April 1-15; starting date : between June 15th and September 1st.

Research objectives: Marine plankton communities varies over space and time in a highly deterministic mode, which appears to be essentially driven by biotic interactions more than abiotic factors. This project will apply high-content 3D microscopy technologies on plankton samples from the local long-term time-series, in order to: (i) unveil the major symbioses, *sensu lato*, between marine protists and other eukaryotic or prokaryotic cells; (ii) describe and measure how these symbioses are established, persist, and fluctuate along seasonal cycles. Overall, this project will bring fundamental knowledge on the structure and dynamics of environmental eukaryotic symbioses, and their role in ecosystem structuring/patterning.

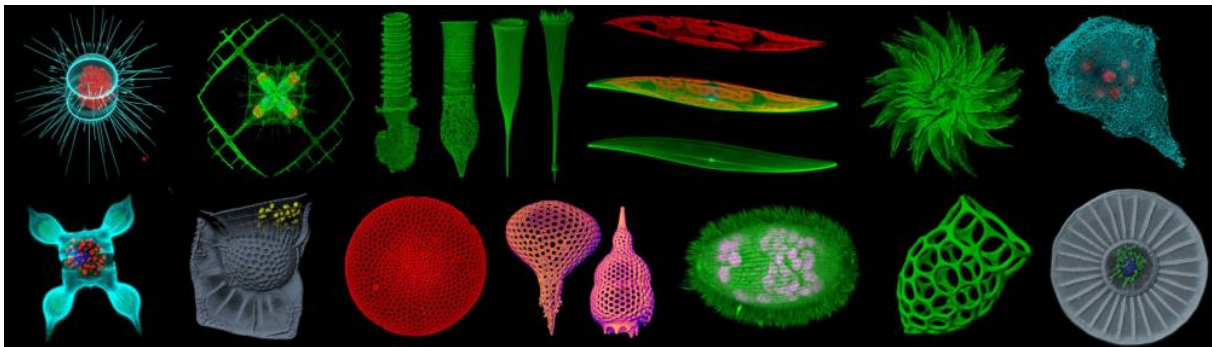
Material & Methods: The candidate will apply pioneering quantitative 3D imaging technologies for environmental cell biology and ecology, developed in collaboration with the EMBL Advanced Light Microscopy Facility (Colin et al. 2017) in the frame of the *Tara* Oceans project (Bork et al. 2015). The eHCFM framework enables quantitative analysis of environmental cell structures, including shape, organelles, symbionts, and potentially expressed genes, across the full diversity of microbial eukaryotes. The technology will be applied to marine plankton samples collected bi-monthly offshore the Roscoff Marine Lab -plankton time-series site. It will be linked to other microscopy approaches available at the Roscoff Imaging Core Facility (e.g. light and electron microscopes, videomicroscope, confocal microscope), and to various single-cell omics (e.g. FISH, DNA barcoding, transcriptomics) and meta-omics methods developed and applied routinely in the ECOMAP team. Local microeukaryotic plankton are also available from the *Roscoff Culture Collection*, that holds >5000 strains of marine plankton (RCC: <http://roscoff-culture-collection.org>)

Context & Significance: The applicant will work in a highly stimulating and interactive environment, under the supervision of Drs Colombari de Vargas and Nathalie Simon. The Station Biologique de Roscoff (SBR, CNRS and Sorbonne University) is one of the leading EU institute in marine ecology and biology, located in a charming small town of character in Brittany. The ECOMAP team (15 permanent researchers and engineers + 20 postdoctoral and PhD students) has a strong historical expertise in plankton diversity, ecology, and evolution, across the entire spectrum of life: vesicles and viruses (AC Baudoux), prokaryotes (C Jeanthon, L Garczarek, C Six, F Partensky), and eukaryotes (L Guillou, D Vaultot, F Not, N Simon, C de Vargas). ECOMAP has sampled plankton offshore Roscoff over the last 20 years, it has co-led the *Tara* Oceans expeditions to map the world ocean plankton over the last 10

years; today ECOMAP is pushing integrative eco-morpho-genomic analyses of plankton eco-systems across both spatial and temporal large and dense ecological scales. The project inserts into the longer-term vision of the team to build up next-generation plankton observatory involving phenOmics technologies. It will also be part of the *Tara* Oceans new project (GOSEE – Global Ocean Systems Ecology & Evolution), involving strong collaboration with EMBL.

Job requirement and application: We are seeking candidates with a PhD in cell biology, biophysics, or microbial ecology, with strong skills in optical microscopy and a *passion for eukaryotic cells' structures and ecology*. Knowledge in live cell imaging, fluorescent probing, micro-manipulation, instrument automation, and image analyses will be appreciated. **Eligible applicants should have a PhD degree and have spent less than 18 months in France within the last 3 years.**

To apply, please send a 1-page motivation letter, a complete CV, and two letters of references in a single PDF-file to Nathalie Simon and Colombar de Vargas: simon@sb-roscoff.fr; c2vargas@gmail.com, by March 30th, 2019.



Selected Publications of the ECOMAP team (amongst the >200 papers (mean IF of 6.4) published over the last 4 years, 2014-18):

1. Bork, P., Bowler, C., de Vargas, C., Gorsky, G., Karsenti, E. & Wincker, P. *Tara* Oceans studies plankton at planetary scale. *Science* 348, 873 (2015).
2. de Vargas*, Audic*, Henry*, Decelle*, Mahé* & the *Tara* Oceans Consortium. 2015. Eukaryotic plankton diversity in the sunlit ocean. *Science*. 348: 1261605.
3. Sunagawa*, Coelho*, Chaffron* & the *Tara* Oceans Consortium. 2015. Structure and function of the global ocean microbiome. *Science*. 348. 1261359.
4. Brum*, Ignacio-Espinoza*, Roux* & the *Tara* Oceans Consortium. 2015. Patterns and ecological drivers of ocean viral communities. *Science*. 348: 1261498.
5. Lima-Mendez*, Faust*, Henry* & the *Tara* Oceans Consortium. 2015. Determinants of community structure in the global plankton interactome. *Science*. 348: 1262073.
6. Villar & the *Tara* Oceans Consortium. 2015. Environmental characteristics of Agulhas rings affect interocean plankton transport. *Science*. 348: 1261447.
7. Guidi*, Chaffron*, Bittner*, Eveillard* & the *Tara* Oceans Consortium. 2016. Plankton networks driving carbon export in the oligotrophic ocean. *Nature*. 532: 465-470.
8. Biard, T., Stemmann, et al. *In situ* imaging reveals the biomass of giant protists in the global ocean. *Nature* 532, 504–507 (2016).
9. Roux & the *Tara* Oceans Consortium. 2016. Ecogenomics and potential biogeochemical impacts of globally abundant ocean viruses. *Nature*. 537: 689-693.
10. Colin, S., Coelho, et al. 2017. Quantitative 3D-imaging for cell-biology and ecology of environmental microbial eukaryotes. *Elife* 6, (2017).
11. Carradec & the *Tara* Oceans Consortium. 2018. A Global Ocean Atlas of Eukaryotic Genes. *Nature Communications*. 9:373.
12. Seeleuthner & the *Tara* Oceans Consortium. 2018. Single-cell genomics of multiple uncultured stramenopiles reveals underestimated functional diversity across oceans. *Nature Communications*. 9:310.
13. Arsenieff L, Simon N, et al. 2019. First Viruses Infecting the Marine Diatom *Guinardia delicatula*. *Frontiers in Microbiology* 9. doi:10.3389/fmicb.2018.03235.