

CALL FOR APPLICATIONS TO CARRY OUT AN
INTERDISCIPLINARY POSTDOCTORAL TRAINING
WITHIN *TARA* OCEANS LABORATORIES

Pilot activity under FONDS FRANÇAIS pour L'ENVIRONNEMENT

Context: The *Tara* Oceans expeditions (2009-2013) systematically sampled marine plankton at 210 sites of the world's ocean, covering the entire ecosystem diversity from viruses and prokaryotes to eukaryotes, including animals (zooplankton). For the first time, a holistic, standardised eco-morpho-genetic dataset was built across a planetary biome (Karsenti et al. 2011, Bork et al. 2015). To date the project has generated the largest meta-omics dataset available (>40 Terabases), including >1,000 virus-, prokaryote-, and eukaryote-enriched metagenomes and metatranscriptomes, as well as >4 billion eukaryotic and prokaryotic metabarcodes from >3,000 size-fractionated plankton communities worldwide. This dataset covering global geographic and taxonomic scales represents a unique opportunity to explore the boundaries of a planetary ecosystem at the interface between oceanography, biodiversity, ecology, and evolution. As a demonstration of the enormous potential behind these resources, the first wave of *Tara* Oceans analyses has been published in 8 papers in *Science* and *Nature* in 2015 and 2016.

Proposed jobs: The 6 interconnected postdoctoral projects proposed here aim at using the power of the complete *Tara* Oceans dataset, finalised in 2016 and including new imaging data, to unravel the architecture of plankton organismal and metabolic networks across our changing oceans (with a focus on expanding anoxic zones), and model their dynamics across space and time, and in comparison to fish population dynamics. Each postdoc will work with a main adviser, but should work in collaboration with at least 2 laboratories of the consortium having complementary expertise in different disciplines.

The call is open to applicants from Argentina, Brazil and Chile. There is an initial funding for 4 positions for 2.5 years, with additional opportunities if applicants are able to secure their own funding or the availability of matching funds from the country of origin or the host laboratory. This scheme aims at fostering the development of interdisciplinary approaches combining new DNA Sequencing methods, bioinformatics, sophisticated imaging methods and oceanography in Brazil, Argentina and Chile. It is therefore expected that applicants keep a close contact with their home institution and develop a strategy to foster collaborations between laboratories of their home country and the *Tara* Oceans consortium, to prepare their future activity upon return to their home country after their stay in *Tara* Oceans laboratories.

Topics

1. **The ecological architecture of total plankton networks & acclimation/adaptation patterns of keystone species.** CNRS, Station Biologique de Roscoff, France. Colombari de Vargha.
2. **Global ocean patterns of morphological and physiological diversity in eukaryotic plankton.** European Molecular Biology Laboratory, Heidelberg, Germany. Eric Karsenti.
3. **Plankton life-history traits and dispersal patterns in the global ocean.** Ecole Normale Supérieure, Paris, France. Chris Bowler.
4. **Linking plankton systems ecology to fish population dynamics and fisheries.** Laboratoire d'Océanologie de Villefranche/Mer (LOV), France. Lars Stemann.
5. **Functional and genetic diversity of eukaryotes in anoxic oceans.** CEA, Genoscope, France. Patrick Wincker.
6. **Prokaryote genome diversity, acclimation and trans-kingdom symbioses in contrasting ocean environments.** European Molecular Biology Laboratory, Heidelberg, Germany. Peer Bork.

This project is funded by the FFEM (Fond Français pour l'Environnement Mondial) and supported by *Tara* expeditions, EMBL, CEA, CNRS, ENS and ANR (Agence National pour la Recherche through the project Oceanomics).

References

- Biard, T., L. Stemann, M. Picheral, et al. 2016. Unexpected biomass of Radiolaria and Phaeodaria (Rhizaria) in the open oceans. **Nature**, in press.
- Bork, P., C. Bowler, C. de Vargas, G. Gorsky, E. Karsenti, and P. Wincker. 2015: Tara Oceans studies plankton at Planetary Scale. **Science** 348:873.
- Brum, J. R., J. C. Ignacio-Espinoza, ... , C. de Vargas, ..., E. Karsenti, and M. B. Sullivan. 2015: Patterns and ecological drivers of ocean viral communities. **Science** 348:1261498.
- de Vargas, C., S. Audic, N. Henry, J. Decelle, F. Mahé, ... , P. Wincker, and E. Karsenti. 2015: Eukaryotic plankton diversity in the sunlit ocean. **Science** 348:DOI:10.1126/science.1261605.
- Guidi, L., S. Chaffron, L. Bittner, D. Eveillard, ... , C. de Vargas, ... , E. Karsenti, C. Bowler, and G. Gorsky. 2016: Plankton networks driving carbon export in the oligotrophic ocean. **Nature** doi:10.1038/nature16942.
- Karsenti, E., S.G. Acinas, P. Bork, C. Bowler, C. de Vargas, ... , the *Tara* Oceans consortium. 2011. A holistic approach to marine eco-systems biology. **Plos Biology** 9(10): e1001177. doi:10.1371/journal.pbio.1001177
- Lima-Mendez, G., K. Faust, N. Henry, ..., C. Bowler, C. de Vargas, and J. Raes. 2015: Determinants of community structure in the global plankton interactome. **Science** 348:1262073.
- Sunagawa, S., L. P. Coelho, S. Chaffron, ... , C. de Vargas, G. Gorsky, ... , S. G. Acinas, and P. Bork. 2015: Structure and Function of the Global Ocean Microbiome. **Science** 348:1261359

Interested applicants should send a full CV, a summary of work carried out during their PhD, list of publications, motivation letter, 3 letters of reference, ranking of the 3 preferred *TARA OCEANS* topics, and personal funding opportunities to:

EMBL
c/o Stefanie Kandels-Lewis
Tara Oceans project manager
Meyerhofstrasse 1
69117 Heidelberg
Germany
kandels@embl.de

The deadline for application is **10 June 2016**.

For additional information about *TARA OCEANS*, please visit www.embl.org/tara-oceans.