

**2019 NF-POGO Visiting Fellowship for  
Ship-board Training**

**Fellowship Report**

**Name of Trainee: Cessna-Pamela Orta-Ponce**

**Name of Supervisor (Parent Institution): Laura Gómez-Consarnau**

**Supervisor (Host Institution): Marta M. Varela Rozados**

**Dates of Training: 27-28 January 2020, 20-22 February 2020, 24-25 February 2020.**

**Section A**

**(To be completed by the fellow)**

*It is the responsibility of the trainee to forward this form to the host and parent supervisor, and to submit a fully completed version to the POGO Secretariat. Please note that the complete report will be made public on the OTP website; Private comments should be included in the separate confidential form.*

**1) Please provide a brief description of activities during the training period:**

My shipboard training activities were developed under a microbial ecology focus, although I was able to learn different activities on a variety of areas due to the participation in three multidisciplinary cruises through the collaboration of all the research staff onboard.

During the months before the cruise, I learned about the different sampling methods and laboratory analyses on board. I was involved in the preparation of the instrumentation that I used during the cruises. I learned how to collect and store samples from the oceanographic bottles for the determination of chlorophyll a, inorganic nutrients, microbial taxonomic composition and abundance (for both genomics and flow cytometry).

After this initial training, I participated in two cruises as part of the RADIALES-20 long term monthly time-series program that has run since 1991 along the coasts of Galicia. I have also joined the RCAN (RADIALES-20 Cantabric) cruise of February of 2020, taking samples along the Cantabric coast. The main objective of my training was to gain hands-on experience in collecting microbial biomass (bacterial and small eukaryotic cells, to be used for DNA taxonomy analyses) from seawater samples at different stations along 5 transects perpendicular to the coasts of Gijon, Santander, Cudillero, Coruña and Vigo. I also took the opportunity to collect prefiltered seawater samples for dissolved organic matter (DOM) characterization analyses: dissolved organic carbon (DOC) concentration, optical properties, and molecular composition (PPL's). In addition to this, I have later collaborated with the inorganic chemistry group in the determination of the measurements of dissolved oxygen,

and collecting samples for the determination of inorganic nutrients concentrations back to our own in-house laboratory.

After the cruise, genomic DNA of the samples collected was extracted using a phenol:chloroform:isoamyl alcohol protocol (Massana et al., 1997). After extraction, the 16S gene was amplified through PCR using the 515F-Y/926 primers described in Parada et al. (2015). The DOM variables were also analysed back to our own in-house laboratory following the methodologies of Dra. Mar Nieto-Cid researcher from the IEO (A Coruña), who is a specialist in the study of DOM for oceanic ecological processes.

## **2) What applications of the training received do you envision at your parent institution?**

The Division of Oceanography at the Ensenada Center for Scientific Research and Higher Education (CICESE), Ensenada, Baja California has 5 departments (Aquaculture, Ecology, Biological Oceanography, Physical Oceanography and Oceanographic Vessels). Within the Department of Biological Oceanography, I will be able to study the biogeochemical processes performed by prokaryotic organisms in the marine environment, where their impact is central for the assessment and management of coastal areas in Mexico. Also, I will be able to integrate and expand the current techniques, campaign models and time series followed at my host institution to improve the current study dynamics in my country.

## **3) Please provide your comments on the Fellowship Programme.**

The techniques I learned are, to my knowledge, some of the newest and most sensitive genomic techniques used nowadays in the study of microbial diversity. This training has been essential for my scientific career. I feel that I now have a complete understanding of how to use these methods, from sampling to data analysis. The hands-on aspect of this experience has been extremely helpful in learning how to properly plan a successful field sampling, to perform each technical step correctly, and getting to know all possible sources of error and/or contamination. I find this crucial to determine the reliability of any analysis and, therefore our results. I learned that this technical aspect is just as important as the scientific questions we try to answer. I want to thank POGO for the opportunity they've given me, and I'm sure this learning experience will set the basis for many of the scientific questions I am planning to pursue in my scientific career.

**CESSNA PAMELA ORTA PONCE**

**Date: April 29<sup>th</sup>, 2020**

### **Section B**

**(To be completed by the host supervisor and returned to the trainee)**

*Please note that the complete report will be made public on the OTP website; Private comments should be included in the separate confidential form.*

## **1) Please provide your comments on the performance of the trainee.**

In this period of personal work, I emphasize Pamela's high skills, as well as her great effort, motivation and interest in work. Pamela has been able to plan and organize her tasks related to the

training on board. During this time, she has also carried out analysis of samples in our laboratory. She has also done a remarkable intellectual work with the data produced, organizing the results. To date, she has shown a high level of performance and scientific skills, as well as being perfectly integrated into the Research Team of Planktonic Ecology and Biogeochemistry (EPB) group. Our laboratory has benefited greatly from her stay at IEO-A Coruña.

**2) Is this exchange likely to lead to future collaboration with the trainee's parent institution? If so please give example(s) of how this collaboration may be pursued.**

We have established collaboration with Professor Laura Gómez-Consarnau from *Departamento de Oceanografía Biológica, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE)* and *University of Southern California (USA)* to quantify the importance of phototrophic processes in bacterial DOM processing. Prof Gómez-Consarnau has recently developed an analytical technique to quantify proteorhodopsin pigments for the first time. Proteorhodopsin photosystems are present in the majority of heterotrophic picoplankton, and is expected to be directly linked to organic matter use. This collaboration will allow identifying patterns of microbial DOM utilization in which light, and therefore phototrophy, are important factors for linking the organisms and the DOM consumed. Professor Laura Gómez-Consarnau has offered members of my research team in Spain the possibility to perform part of these analyses by a short stay in her laboratory.

**3) Please provide your comments on the Fellowship Programme.**

This training gave Pamela the chance to put into practice different methods of capture and analysis of microbial and chemistry samples that will serve her to complement her training in marine research. I highly appreciated having an extra pair of hands on –board the ship, but also Pamela supported new ideas.

In addition, this is a great opportunity to establish permanent cooperation links with the parent institute (CICESE, Mexico), which will result in project requests and / or publication of collaborative scientific papers.

**Marta M Varela Rozados**

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**Date: May 1<sup>st</sup>, 2020**

**SECTION C**

**(To be completed by the parent supervisor and returned to the trainee)**

*Please note that the complete report will be made public on the OTP website; Private comments should be included in the separate confidential form.*

**1) Do you agree with the above comments and do you have any additional feedback you wish to provide? I agree with the information provided by the student.**

**Laura Gomez Consarnau**

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**Date: April 30<sup>th</sup>, 2020**