



INTEGRATED WORKSHOP

Marine Genomics Europe and MarBEF

Plankton Course, Barcelona, June 2007

Course participants with lecturers Chris Bowler and Ginger Armbrust, as well as organisers Pep Gasol (CSIC, Spain) and Ulrika Hjelm.

'Integrating ecological and genomic aspects by teaching and training around a plankton bloom'

By Johanna Wesnig, Adrianna Ianora, Josep (Pep) Gasol and Jessika Kegel

The CSIC-CMIMA (a member of both of the Networks of Excellence, i.e. Marine Genomics Europe and MARBEF) made it possible to hold a two weeks' summer school for PhD students and postdocs from both projects in Barcelona with the title: "How to study bloom development and aftermath in an integrated way using molecular and genomic tools."

The school was organised in morning sessions consisting in theoretical lessons by different teachers and afternoon sessions dedicated to practical laboratory protocols and experiments. Twenty students from eleven countries, ranging from Lithuania to Israel, attended; CSIC guests were welcome during all lectures and much of the CSIC staff helped with the practicals.

The course contained as a red thread teaching around all stages of a plankton bloom. One teacher per day was invited, starting during the first week with genomic expertise on phytoplankton organisms, presented by Chris Bowler (ENS, Paris) and Virginia Armbrust (Univ. Washington, USA). Then, state-of-the-art bacterioplankton methodology was explained and demonstrated by Bernard Fuchs (MPI Bremen) and Mary Ann Moran (Univ. Georgia, USA). In the evenings, CSIC scientists gave one review lecture per day on their related fields of study, with a highlight by Carlos Pedros-Alio (CSIC, Barcelona) on how to hold a good presentation.

In parallel, the CSIC staff around Pep Gasol, who was the main course organiser, set up a mesocosm experiment on the first day of the course. It was sampled regularly and the teachers could "buy in" to get fresh samples to

present their techniques. Every day started with Pep giving an update of the experimental data measured so far, and the afternoons were dedicated to practicals covering techniques like flow cytometry, FISH (Fluorescent *in situ* Hybridization), PCR (Polymerase chain reaction), virus determination and many others.

After a relaxing weekend, with a very nice excursion on Saturday to the Dali Museum, an unspoilt beach and coastline along the Costa Brava, as well as the old university town of Girona, which included a generous dinner for all, the group spirit and energy for the second week were reinforced. Following the transfer of the plankton biomass into the food web, Willie Wilson (now based in Bigelow, USA), David Montagne (Uni Liverpool) and, as a double act, Penny Lindeque (PML, Plymouth) and Jens Neistgaard (Uni Bergen) spoke with great enthusiasm on viruses, nano-, micro- and large zooplankton.

The final day was left to wrap up the results of the mesocosm experiment, in which a strong diatom bloom had developed, as well as to tie together the different elements of the course. Unfortunately, Victor Smetacek (AWI, Bremerhaven) was unable to attend so his postdoc, Philip Assmy, presented Victor's talk to tie all

the many elements presented over the two weeks together, in what was an excellent final talk.

During the discussion sessions, lecturers and members of the organising committee, Adrianna Ianora (SZN, Naples), Thierry Comtet (CNRS, Roscoff) and Johanna Wesnig (EMPA, Bremen), and a guest lecturer at the CSIC, were present, which helped to enhance the discussions shaped by the many student contributions. A number of attendants gave short insights into their areas of work: diatom-copepod interactions by Adrianna and how to get funding from FP7 as a postdoc by Johanna, who runs a consultancy agency specialising on European project management.

The students were extremely happy with the overall course including the diversity of lecturers covering the wide-ranging scope. They gave very good feedback on what could be improved, indicating that such a course might be worth repeating and that it was an excellent opportunity for networking. The lecturers and organisers got the feeling that the team spirit which developed might help the emerging scientists to form an integrated researcher network in the future.

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Training and Integration

Erasmus Mundus MASTER OF SCIENCE IN MARINE BIODIVERSITY AND CONSERVATION



MSc in marine biodiversity & conservation

In September 2008, an Erasmus Mundus Master of Science in Marine Biodiversity and Conservation (EMBC) programme was launched as a collaboration between six European universities as core partners, and with all the MarBEF institutes and universities as satellite partners.

Bachelor of Science students with a minimum of three years of university studies (or 180 credits) from anywhere in the world can enrol for this joint degree MSc programme (120 Elective Credits, or ECTS) run by these six European universities:

- Ghent University (Belgium)
- University of Bremen (Germany)
- University of the Algarve (Portugal)
- University Pierre and Marie Curie - Paris 6 (France)
- University of Oviedo (Spain)
- University of Klaipėda (Lithuania)

These have to provide at least 40 ECTS in the running programme.

Why Marine Biodiversity and Conservation?

The marine environment is a precious asset. Oceans and seas provide 99% of the available living space on the planet, cover 71% of the Earth's surface and contain 90% of the biosphere, and consequently a large share of global biological diversity. Marine ecosystems play a key role in climate and weather processes. Indispensable to life itself, the marine environment is also a great contributor to economic prosperity, social well-being and quality of life. However, the marine environment is facing a number of threats including loss or degradation of its biodiversity and changes in its structure, loss of habitats, contamination by dangerous substances and nutrients, and the impacts of climate change.

The EU Marine Strategy provides an integrated framework for analysing relevant Community policies' contributions to the protection of, and impact on, the marine environment. In order to achieve these goals, we need to have well-trained people who are able to evaluate, understand and investigate the state of the marine environment, and this at different levels and from different disciplines, such as general oceanography, ecology, chemistry, physics, statistics, geology, social sciences, economy and aquaculture.

This Erasmus programme is strongly oriented to the fundamental understanding of the structure and function of marine biodiversity, to the acquisition of several kinds of tools required for understanding the complexity of biodiversity patterns and processes and, finally, to the application of this knowledge for nature conservation and restoration.

A unique programme

The study programme is divided into three thematic modules:

1. Understanding the structure and function of marine biodiversity (at least 24 ECTS). This module deals with the fundamental aspects of oceanography (on a multidisciplinary basis, including physics, chemistry, geology, biology, ecology, biogeography and climate change), the structure and functioning of marine biodiversity (from genes to habitats) and impact studies.

2. Toolbox for investigating marine biodiversity (at least 20 ECTS). This provides advanced training in statistics and experimental design, modelling, taxonomy, data and information management, field observations and interpretation, and molecular methods.

3. Conservation and restoration of marine biodiversity (at least 10 ECTS). This deals with the application of the above-mentioned theories and methods in order to develop a sustainable use of the marine environment.

The EMBC programme (two years or 120 ECTS) is complemented by summer schools (6 ECTS) on specialised topics in marine research stations operating within the MarBEF network.

In the second year, a research project (Master's thesis) of 30 ECTS is scheduled.

For the development of personal skills and skills in research project implementation (i.e. transferable skills), at least 10 ECTS are required and may include basic training in the native language of the country of study, training in scientific communication, and research management, the latter related to one or more

of the topics in the thematic modules. Although the courses will be given in English, native language training will enhance social integration of students in their host countries.

Elective courses (from other disciplines or organised within EMBC) can be chosen for 20 ECTS.

Live and learn in at least two European cities

Student mobility is an obligatory and integral part of this Erasmus programme. Students in first year will choose between three universities (Ghent, Bremen or Algarve), which offer basic multidisciplinary courses in the first semester. For the second semester, each of these universities organise more specialised courses, starting with scientific training in research.

In the second year, students move to Paris, Oviedo or Klaipėda for the first semester. For the second semester, students can move again to the research institutes (including MarBEF institutes) where their thesis work is based.

Added value of EMBC

The European added value of EMBC is evident, as it contributes to higher education and the development of the so-called Bologna Process. More precisely, the EMBC programme:

- clusters and creates synergies between the participating universities that offer only national related master's programmes, although not yet specifically oriented to marine biodiversity and conservation
- offers high-level education and training in a multidisciplinary field
- offers education and academic training of marine scientists who will be able to implement the new EU marine directive
- provides the tools to bring students into contact with a variety of European research institutes, linked to the universities through common research (thesis) projects
- will bring a blend of European and non-European students in contact with different European languages.

The summer school, in which all students

participate after their first year, is the ideal place to focus on the European dimension.

The EMBC can help in the implementation of strategies for future sustainable use of natural marine resources, taking into account the natural ecological background of ecosystems.

EMBC Masters will be able to operate on a global scale, since there is no restriction in the programme regarding types of biotopes (from the coast to deep sea, or from Pole to Pole).

Language

Proof of knowledge of the English language has to be given by TOEFL test or equivalent. During the study period, the native languages (Dutch,

German, Portuguese, French, Spanish or Lithuanian) can be studied as part of the programme.

Who can apply?

The course is open to students with at least a Bachelor (or Master's) degree in biology, ecology, environmental sciences, oceanography, marine sciences, geography, geology, or other equivalent degrees with minimum 180 credits.

Further information on Scholarships, participating core universities and their main faculty members, linked institutions and application forms can be found at <http://emb.marbef.org>.

Contact information

Secretariat of EMBC

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Cruising and matchmaking

By **Brian R. MacKenzie and Pascal Lorance**

A MarFISH initiative, born during a MARFISH RMP meeting in Estonia in 2006, came up with the novel idea of setting up a mechanism to inform students and scientists of vacant spaces on fishery research cruises.



R.V. Dana.

The plan, fully supported by MarBEF, is to allow students and others to come on board a fisheries research cruise and get some experience, ideally, though not necessarily, on a foreign vessel. They would learn some basic fish-sampling methods and some fish biology and the cruise leader would benefit by getting some extra assistance. Scientists could participate by getting samples for specific projects. Everybody (i.e. visitor and host) gets the inter-cultural experience of dealing with some foreigners, thereby facilitating possible

collaboration, integration and future networking.

The costs for the student onboard would be covered by the host institute as if the student were a member of the host's staff (e.g. the student would not have to pay for room and board on the ship). Travel costs to and from the ship would be covered by the student's institute, but not necessarily from MarBEF funds, unless the student's participation was essential to execution of the RMP. Other logistical arrangements (e.g. health status, insurance) would have to be resolved between the student and cruise leader.

The mechanism for facilitating contacts between potential cruise participants and the cruise leader will use the MarBEF news bulletin and the MarFISH website as described below:

1. Cruise leader sends a short message to MarBEF webmaster (Ward Appeltans;

ward.appeltans@vliz.be) several weeks in advance of the cruise. The message should:

- Identify the MarFISH contact person for the cruise or the cruise leader and their email addresses

- Give a short description of the cruise, such as where and when the cruise is leaving, what species they are sampling, brief purpose of the cruise (e.g. *RV Dana* will leave Copenhagen to sample coral reef fish in the Caribbean Sea, Feb. 1-28, 200x; space available for students and colleagues).

2. Ward will place the notice on the MarFISH website several weeks in advance of the cruise. A short announcement of the cruise will also be made via the MarBEF web news bulletin which will contain a link to the website where the contact and cruise details could be found.

3. Ward will also place the notice on the MarBEF JOB Portal, which is a mobility portal not only for real jobs, but also for voluntary work, training, etc. This will increase visibility of the cruise to potential participants.

In future, if you have cruises which have extra space for collaborators and you want to recruit some new investigators, please be sure to inform Ward. Who knows? Maybe you will find the student who will help you write that high-impact paper when she or he comes to do a PhD or PostDoc with you!



CEFAS Endeavour.

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