

SEE INSIDE FOR AN ARTICLE ON THE NAGOYA PROTOCOL AND WHAT IT MEANS FOR SCIENTISTS WORKING IN EUROPE



**MaCuMBA** is a four-year research project that aims to uncover the untold diversity of marine microbes using cultivation-dependent strategies. This joint venture of 22 partner institutions from 11 EU countries is led by the Royal Netherlands Institute for Sea Research (NIOZ), and has a budget of more than €12 million, of which €9 million is funded by the EC Seventh Framework Programme.

# MaCuMBA

# project news

[www.macumbaproject.eu](http://www.macumbaproject.eu)

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## MaCuMBA Summer School a Great Success!

**MaCuMBA** organised a two-week Summer School on 'Sampling, Isolation & Cultivation of Marine Microorganisms' which was held on the island of Texel in the Netherlands from 12-24 July 2015. Here, **MaCuMBA** coordinator Lucas Stal tells us about its success.



Prof Lucas Stal, MaCuMBA Project Coordinator

The two-week **MaCuMBA** Summer School was organised by NIOZ with the help of AquaTT and took place in the premises of NIOZ on the island of Texel. The Summer School was open to both **MaCuMBA** partners and external participants and about 40 students from all over the world applied for

places. Unfortunately there was only space for 20, and final selection included participants from 13 different countries, with 13 different nationalities. Seven students originated from **MaCuMBA** partner institutes. The participants and lecturers were accommodated in Hotel 'De Pelikaan' on Texel and transported to NIOZ by a daily bus shuttle.

The Summer School was organised and led by Prof Corina Brussaard and Prof Klaas Timmermans of NIOZ- Texel and Dr Henk Bolhuis, Dr Silvia Crețoiu, and Prof Lucas Stal of NIOZ-Yerseke, who were present for the duration of the Summer School and acted as mentors and teachers for the participants in addition to presenting various lectures and assisting with the practical sessions.

The success of the Summer School was primarily thanks to the contributions of the expert lecturers, many of whom were from our **MaCuMBA** consortium, which helped tremendously to keep the fee for the students as low as possible. The lectures in the mornings were mostly given in the auditorium of NIOZ and the workshops in various other rooms. The practicals in the afternoons took place in



Students participating in a practical at the MaCuMBA Summer School

several laboratories of NIOZ with the help of Josje Snoek and other lab technicians. Some of the evenings were reserved for short presentations by the participants, as well as a workshop on microscopy, and time dedicated to developing a 'Future-of-cultivation' assignment.

During the weekend at the half-way point of the school, a trip to Amsterdam was organised on Saturday with a visit to: 'Micropia' ([www.micropia.nl](http://www.micropia.nl)), the unique microbe zoo; the open-air museum 'Zaanse Schans' ([www.dezaanseschans.nl](http://www.dezaanseschans.nl)), with Dutch windmills, cheese making and other typical Dutch sights; and ended with

Country	Resident	Nationality
Belgium		1
Cyprus	1	1
Denmark	1	
Ecuador	1	1
Finland	2	2
France		1
Germany	4	5
Greece	1	1
Italy	1	2
Jordan		1
Morocco	1	1
Netherlands	3	1
Norway	2	2
Spain	1	1
Sweden	1	
UK	1	
Total	13/20	13/20

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Prof. Corina Brussaard (NIOZ) addressing participants in the summer school

a nice dinner in a local restaurant and the last ferry to the island. On Sunday we visited the Seaweed Centre of NIOZ and learned how to sample water from the NIOZ jetty in the Marsdiep and subsequently how to use these samples for isolation using the **MaCuMBA** Survival Box. This was followed by a sightseeing tour to see the island of Texel, combined with a visit to the 'Slufter', a dynamic coastal area that developed after a storm in 1858 destroyed the dunes, followed by sampling of intertidal sediments and microbial mats in 'De Cocksdoorp' in the northern-most end of the island. Sediments were frozen in situ using the so-called 'cryo-lander' and liquid nitrogen. The day ended with a wonderful dinner in the beach restaurant 'Paal 17'.

We acknowledge the fantastic help of Frida Kraanen concerning the logistics of the Summer School. Frida helped each and every student and the guest lecturers with all their questions. We are thankful for the inspired contributions of Dr Gaëtan Burgaud, Mrs Catarina Cucio, Dr Colin Ingham, Prof Dr Mohamed Jebbar, Dr Gwenaelle LeBlay, Dr Cendrella Lepieux, Dr Ada Librada Canedo, Dr Dominique Marie, Prof Dr Jörg Overmann, Dr Lynn Paterson, Dr Jörg Peplies, Dr Jerry Reen, Prof Dr Francisco Rodriguez Valera, Prof Dr Dave Scanlan, Mr Hans Slagter, Dr Ulrich Tillich, and Dr Thomas Vanagt. We were also

lucky to have some excellent lecturers from outside **MaCuMBA** who volunteered to cover important areas that are unavailable within **MaCuMBA**. We acknowledge with gratitude the contribution of Prof Dr Gijs Kuenen for opening the School with an important lecture and practical on fundamentals in microbiology. Dr John Day discussed and exercised the preservation of cultures and Prof Helena Vieira made the students aware of the fact that they all could become entrepreneurs.

The great diversity of lecturers allowed a large variety of aspects to be discussed and demonstrated in the laboratory and as workshops. These included topics ranging from medium design and thermodynamics, to metabolic pathways and biochemistry, to isolation and culturing of bacteria, fungi and phytoplankton, to culture collections and preservation, and finally, topics most of the students were unaware of such as the consequences of the Nagoya Protocol and the European legislation in relation to that, and how to start your own business. Project partner eCOAST recorded many of the activities of the Summer School as part of the planned **MaCuMBA** video.

The reactions of the students and the lecturers were overwhelmingly positive and this led to the idea that in this time of OMICS-dominated microbiology there might be a real need for an undergraduate/graduate course on sampling, isolation and cultivation of (marine) microorganisms. The organisers will evaluate this Summer School and discuss the potential to make this a recurrent course, something which would be a fitting aspect of the **MaCuMBA** legacy.

*Lucas*

## Summer School Participant Feedback



**Name:** Friederike Eimer

**Institute:** Gothenburg University, Sweden

**Tell us about your research:**

My research is focused on examining the positive interaction of microbes with seaweed and how microbes aid in the development, growth, surface attachment and morphogeneses.

We have been successful in the establishment of a robot for picking single microalgal colonies grown on agar plates as well as in the establishment of a microcultivation platform for the cultivation of strains in deep-well microtiter plates (dw-MTPs) in combination with pipetting robotics for culture sampling, feeding and dilution respectively.

**What were your reasons for applying for this course?**

My knowledge about environmental microbiology is basic and outdated. I applied to the course to receive a refresher in analytical, theoretical and practical microbiology.

**What was your overall impression of the course?**

The course was well organised and thought through. Although the course was demanding and time intensive it offered the opportunity to explore and try a variety of techniques which can be applied into my own research.

**What part of the course did you enjoy the most?**

All parts had their advantages. I especially enjoyed the chemotaxis practical as it is a technique I can easily implement into my own lab. The lectures gave a good overview about what is currently being done in the field.

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### What do you feel is the most useful thing you have learned on the course and why?

We were told about the importance of media design according to the environment in which the microbe lives and it is the most valuable thing I will take from this course.

### How will this training impact your research?

The course provided me with the knowledge to effectively design appropriate media for the isolation and extraction of microbes. The course introduced me to many interesting people whom I can contact for further information and for help with my future research. The networking opportunity was immense.



**Name:** Ronja Kossack

**Institute:** Interfaculty Institute of Microbiology and Infection Medicine, Eberhard Karls University Tübingen, Germany

### Tell us about your research:

My research focuses on the isolation of cyanobacteria

from different habitats in Germany and Indonesia with subsequent culturing and anti-infective screening for bioactive secondary metabolites. In case of a positive hit extraction, fractionation and purification of the compound will be done followed by structure elucidation.

### What were your reasons for applying for this course?

I heard about the course during a workshop at Cyano Biotech and hoped to learn some practical tricks in relation to isolation, taxonomy and culturing of marine microorganisms, especially cyanobacteria.

### What was your overall impression of the course?

The course was really well organised with interesting and inspiring lectures. I enjoyed connecting with other young researchers from around the world. Furthermore, it was a great opportunity to get tips from experienced and specialised researchers.

### What part of the course did you enjoy the most?

I mostly enjoyed the sampling and the isolation of marine fungi.

### What do you feel is the most useful thing you have learned on the course and why?

The sampling techniques and isolation tricks I learned while engaging with the lecturers was most useful to me as I will have to prepare a sampling expedition to Indonesia soon and I wanted to get as many tips as possible.

### How will this training impact your research?

I will reconsider my isolation techniques, set-up and media. I will also try to be more innovative and try to find new ways and approaches.



**Name:** Yiota Lazarou

**Institute:** Oceanography Centre, University of Cyprus, Cyprus (OC-UCY)

### Tell us about your research:

My current research interests at the OC-UCY involve the collection, analysis and

classification of mesozooplankton samples with the use of the Zooscan digital imaging system. I also run water sample analyses for nutrients and chlorophyll. Further, I take part in the programmes of la Commission Internationale pour l'Exploration Scientifique de la Méditerranée (CIESM) 'Tropical signals' and 'Jellywatch', by recording invasive and endemic species and estimating their abundances, and lastly, contribute towards the SEA preparation for the Cyprus Marine Spatial Planning project.

### What were your reasons for applying for this course?

I am currently in the phase of looking for a challenging

PhD research project and although I have applied many genomic and metagenomic approaches during my studies, I never had the opportunity to be involved in marine microbiology. I wanted to explore the potentials of research in this area from the production of biofuels to the design of anti-tumour drugs. I was looking for the ideal summer school to get an overview of the recent advances in this field in relation to the more traditional techniques and principles. OC-UCY is also willingly trying to expand the Centre's research interests towards this area, setting the development of marine microbiology and blue technology in high priority. This is also supported by the current national demands to increase our knowledge of the under studied Levantine basin, due to the increased gas exploitation activities in the EEZ of Cyprus.

### What was your overall impression of the course?

It exceeded my expectations. The organisers paid great attention to detail. For example there was a great balance between the theoretical and practical parts. The programme was suitably designed towards the researchers' interests and background knowledge.

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### What part of the course did you enjoy the most?

In my opinion, the practicals were the best part of the course because we got to apply some of the main fundamental principles of marine microbiology, combined with the recently developed techniques that have been designed during the **MaCuMBA** project, like the Microdish culture chip and the laser tweezers.

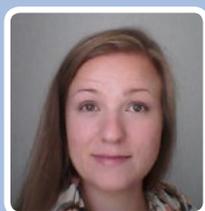
### What do you feel is the most useful thing you have learned on the course and why?

I strongly believe that the most important thing we have learned during the course is the way we should address certain topics, and which factors or principles we should have in mind when designing our projects, sampling, or even data processing. "Always take into consideration the thermodynamics, the environmental conditions the

organism is living in, its metabolic characteristics, but also criticise a given protocol and media recipes; don't accept anything without filtering it first; ensure you produce research that is scientifically strong" is just some of the advice and suggestions given by our lecturers that I will treasure forever.

### How will this training impact your research?

Although I currently have some offers for PhDs, I will try to see if I can do something in relation to marine microbiology. If this is not possible I will search for the ideal project that focuses on marine microbiology. Overall, the course helped me a lot for the continuation of my studies, providing me with the principles, ideas, and techniques that will stand as the cornerstone of what I am trying to achieve. I thank NIOZ for that!



**Name:** Katariina Natunen

**Institute:** Finnish Environment Institute (SYKE), Finland

### Tell us about your research:

I am a second-year PhD student at Aalto University School of Chemical Technology and SYKE Marine Research Centre, where I have worked as a research scientist since 2011. My field of research is applied phycology and in my PhD project I study recycling of nutrients from waste waters with multispecies microalgae cultures.

### What were your reasons for applying for this course?

My reasons for applying were to gain new perspectives, ideas and methods related to my research. I also saw this summer school as an excellent networking opportunity.

### What was your overall impression of the course?

It was an intensive course presenting different activities in the **MaCuMBA** project and novel methods for isolating and cultivating marine microorganisms. Attending this course was a great way to gain new knowledge about marine microbiology.

### What part of the course did you enjoy the most?

I especially enjoyed the versatile daily practicals and the presentations by the participants. I also enjoyed the weekend programme including the trip to Micropia and visiting different sampling sites on Texel.

### What do you feel is the most useful thing you have learned on the course and why?

I got an up-to-date view on novel and more traditional methods applied in marine microbiology, which I value a lot. Learning more about flow cytometry, cultivation and cryopreservation of microalgae and how to design cultivation media was particularly useful, because those are the methods and skills I can make the most of in my work.

### How will this training impact your research?

I will look at the methods I commonly apply from a new perspective. I will revise my methods and see which of the new ones learned in this summer school I could adopt in my daily work. Also the useful tips and advice that I received from the mentors and other participants will positively impact my research.



**Name:** Talal Salih

**Institute:** University of Strathclyde Glasgow UK

### Tell us about your research:

My research focuses on the isolation and identification of novel or new Actinomycetes, in particular Streptomycetes bacteria from extreme or unexplored environments in order to identify novel

bioactive secondary metabolites which could serve as potentials for drug discovery after their clinical trials.

### What were your reasons for applying for this course?

This course was aimed at expanding the skills and techniques in my research area and I wanted to learn these methods.

### What was your overall impression of the course?

The course was great. I had the opportunity to interact with

experts in the field of marine microbiology and learn state of the art techniques in this field.

### What part of the course did you enjoy the most?

The majority of the fields and techniques covered in this course were beneficial. I particularly enjoyed learning about the isolation, culturing, cryopreservation, high throughput cultivation techniques like Microdish culture chip, optical tweezers and liquid handling robot.

### What do you feel is the most useful thing you have learned on the course and why?

One of the most important things I have learned is that there is no single perfect, unique technique or method to isolate and identify microorganisms and their natural products. You must be creative and innovative in this field of study and you must try many approaches to get the right solution.

### How will this training impact your research?

My techniques for isolating microorganisms and screening of their novel bioactive metabolites have improved. The course has increased my capabilities to contribute changes and advancements in this area.



**Name:** Marta Volpi

**Institute:** University of Aarhus, Denmark

**Tell us about your research:**

My research focuses on microbial dispersal, by investigating abundance and identifying thermophilic endospore-forming fermentative bacteria retrieved in cold marine sediments.

### What were your reasons for applying for this course?

To learn about isolation and cultivation techniques so that I can find the best way to step forward in my project, and to implement personal knowledge.

### What was your overall impression of the course?

The course had a detailed schedule which allowed me to

gain practical experience on a broad range of applications.

### What part of the course did you enjoy the most?

The visit to the Micropia 'museum'! And the use of genome informations to design the best strategy for isolation.

### What do you feel is the most useful thing you have learned on the course and why?

The isolation from marine sediments and the possibility to use a Petri dish with natural medium covered by a layer of agar to have nutrient diffusion.

### How will this training impact your research?

I will be able to make the best choice about the best medium and conditions to isolate my bacteria (even though I will work anaerobically). I am now aware of the research field I will be occupying by doing this.



## Petri Dish Profile: Sina Bold

I am currently studying Science Communication (MSc) at Dublin City University, Ireland. As part of these studies, I have completed an internship at AquaTT, who fortunately share my interests at the interface between marine science and science communication. It was there that I became involved with the **MaCuMBA** project.

important process in the removal of oil from the environment. However, nutrients often become limited in oil-contaminated environments. That is why my research focused not only on oil degrading bacteria but also on those which additionally have the ability to fix molecular nitrogen to potentially overcome nutrient limitation.

Inspired by the buzzing life in a drop of seawater, I developed an informational brochure about marine phytoplankton in cooperation with AquaTT to give people access to this usually hidden world right in front of us: <http://goo.gl/nxJ6AL>

Previously, I studied Biological Oceanography (MSc) at GEOMAR, Helmholtz Centre for Ocean Research, Kiel, Germany and Biogeoscience (BSc) at Friedrich-Schiller University, Jena, Germany.

In my Master's thesis project, I investigated microbial oil degradation in marine sediments. Biodegradation is the most

After my graduation in September, I would either like to do a PhD in marine microbiology while passionately communicating my research or driving science communication and outreach at a research institute, preferably in the marine realm.

**Contact:** [sina.bold2@mail.dcu.ie](mailto:sina.bold2@mail.dcu.ie)

## The Nagoya Protocol - What Scientists Need to Know



**eCOAST**  
MARINE RESEARCH

**Thomas Vanagt,**  
**eCoast Marine Research:**

*\*This is an abridged version of Thomas' article. The complete article will be*

*published on the [MaCuMBA](#) website soon.*

While marine scientific research largely contributes to improving our knowledge of the marine environment and biodiversity contained therein, it is also a regulated activity requiring full compliance with international rules and standards. These rules and standards are all too often unknown to scientists involved in collecting biological samples in the marine environment. With the entry into force of the Nagoya Protocol<sup>1</sup> to the Convention on Biological Diversity (CBD) in October 2014, the legal landscape surrounding how genetic resources (including marine genetic resources) are sourced and used for research and development has changed. On 12 October 2014 a new Regulation to implement the Nagoya Protocol within the European Union entered into force.

The combined effects of the Nagoya Protocol and the EU Regulation 511/2014 will be to impose significant new obligations on researchers who sample, source and utilise genetic resources in their R&D. It is therefore essential for researchers interested in sampling, sourcing and/or utilising marine genetic resources to understand and be aware not only of the new EU Regulation but also the Nagoya Protocol and its access and benefit sharing (ABS) regime. Furthermore, genetic resources found in the marine environment are also subject to the rules and principles of the United Nations Convention on the Law of the Sea (UNCLOS). This article will review these legal and policy developments. It will consider also the implications for scientists in terms of their obligations concerning ABS of marine genetic resources and highlight what scientists should know and should do in order to comply.

### Access and Benefit-Sharing: The derivation of legal and regulatory instruments.

The Convention on Biological Diversity (CBD) is an international treaty that recognises the sovereign rights of States over their natural resources and prescribes that the authority to determine access to genetic resources within national jurisdiction (including marine genetic resources rests) within the provider States. The CBD has three main objectives: the conservation of biological diversity;

the sustainable use of its components; and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources. Overall, it aims to develop national strategies for the conservation and sustainable use of biodiversity.

The Nagoya Protocol to the CBD provides a legal framework for implementing the third objective of the CBD, establishing an ABS regime for determining under what conditions access to genetic resources and (where applicable)<sup>2</sup> associated traditional knowledge held by indigenous and local communities should be granted, and how the benefits arising from their utilisation should be shared. Governments of countries who are party to the Nagoya Protocol must now decide what measures to put in place to ensure that the use of genetic resources within their jurisdiction is in accordance with the general principles of the CBD and its Nagoya Protocol.

The ABS regime developed under the CBD and the Nagoya Protocol is based on a bilateral approach under which if you desire to access genetic resources, you must verify if the provider State where you wish to sample has an ABS legislation in place prescribing for priori informed consent (PIC) and eventually enter into negotiation with this country. To comply with the requirements of the Protocol you must first negotiate what is called mutually agreed terms (MAT) in order to obtain what is called the prior informed consent (PIC) of the provider country, when the national legislation of the provider country requires so. The provider country is either the country of origin (that is the country which possesses the genetic resources in in-situ conditions) or the country that has lawfully acquired the genetic resources.

The term PIC makes reference to the right of the provider country to permit or deny access to genetic resources found within its national jurisdiction. Where genetic resources are associated with traditional knowledge, the PIC of indigenous local communities is also required. As far as MAT is concerned, it is defined as an agreement specifying the terms and conditions of access and utilisation of genetic resources. It has to be negotiated by the legal representative of the scientific institution planning to sample and the provider country through its competent national authority as listed in the country profiles on the ABS-Clearing House mechanism <https://absch.cbd.int>. This is not to be confused with material transfer agreements (MTA) which are concluded between research institutions when a sample is transferred.

**Institution to institution MTAs may not satisfy the obligation of the Nagoya Protocol!**<sup>3</sup>

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<sup>1</sup> Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation

<sup>2</sup> Traditional knowledge associated with genetic resources held by indigenous and local communities apply rarely or not at all in situations where genetic resources are sourced from the marine environment.

<sup>3</sup> Exception : the Standard Material Transfer Agreement of the International Treaty on Plant Genetic Resources for Food and Agriculture

### Sampling marine genetic resources in-situ

When sourcing marine genetic resources in-situ, provisions of the UNCLOS may apply depending on the maritime zone in which sampling takes place. Any marine scientific research project carried out in maritime zones under the jurisdiction of Coastal States must comply with the national laws of that Coastal State. This may include requests for permits to enter and sample in these areas. **These permits are distinct from those required**

**under the CBD and the Nagoya Protocol and so must not be confused.** Compliance with UNCLOS permitting requirements does not ensure compliance with national ABS regime under the CBD and its Nagoya Protocol, and vice versa. Therefore researchers entering the waters of a Coastal State to take biological samples must abide by the national laws governing marine scientific research but should also contact the ABS Competent National Authority of the Coastal State to establish what, if any, ABS requirements are in place.

### What Researchers Using Marine Genetic Resources in the EU Should Do:

- ➔ If you wish to sample marine genetic resources from the waters of a Coastal State (being also the State of your research institution), contact the ABS national focal point of that state and establish what the rules are governing access to their genetic resources and benefit-sharing. If you are collaborating with a partner institute or collaborator from that State **do not assume that collaborating colleagues are aware of what rules are in place in their own country.** If you bring genetic resources into your own country that have not been obtained lawfully in respect of any ABS laws of the providing country you will be in non-compliance with the EU Regulation.
- ➔ If you are entering the waters of a foreign State on board a research vessel, the research vessel services or PI must ensure they have received the necessary clearance under UNCLOS (through the appropriate official channels of the researching and Coastal States) well in advance of any proposed sampling expedition.
- ➔ If you wish to obtain genetic resources from a foreign collaborator, contact the ABS national focal point of that country or ask your collaborator to do so and verify what the rules are governing access to their genetic resources and benefit-sharing before taking receipt of any genetic resources.
- ➔ Ensure that any genetic resources you are currently using can be documented as to when and where they were originally sourced/sampled. It would be advisable to check with the ABS national focal point of the country from which the resources originally came to establish if that country was regulating access to its genetic resources with benefit-sharing at the time the resources were originally collected (even if this pre-dated 12 October 2014) because the CBD was already in place and some national legislations have already been adopted and implemented.
- ➔ Document and retain evidence of all attempts to contact National Focal Points, Competent National Authorities, requests for permits, Prior Informed Consent, Mutually Agreed Terms etc.

- ➔ If you wish to transfer genetic resources from your own country to a foreign collaborator, check with your own ABS National Focal Point to establish if your own country is regulating access to its genetic resources with benefit-sharing.
- ➔ Consider obtaining samples from a European Union registered collection.
- ➔ If your institute has its own collection, consider registering it as a trusted collection.
- ➔ Consider if you can apply, with an association of users, to have a combination of specific procedures, tools or mechanisms recognised as 'best practice'. Following the procedures as described in an EU acknowledged 'best practice' will ensure that you are in compliance.

### Further Reading and Useful Links

For further information on UNCLOS, please refer to L.E. Lallier, O. Oonagh, T. Greiber, T. Vanagt, A. D. W. Dobson and M. Jaspars, 2014 'Access to and use of marine genetic resources: understanding the legal framework' Nat. Prod. Rep. 31, 612

<http://pubs.rsc.org/en/content/articlehtml/2014/np/c3np70123a>

<http://absch.cbd.int>

[http://ec.europa.eu/environment/nature/biodiversity/international/abs/pdf/Q\\_As\\_on\\_ABS.pdf](http://ec.europa.eu/environment/nature/biodiversity/international/abs/pdf/Q_As_on_ABS.pdf)

[http://www.un.org/depts/los/convention\\_agreements/convention\\_overview\\_convention.htm](http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm)

### KEY POINTS:

- ✓ Always comply with the Nagoya Protocol and the EU Regulation
- ✓ In the event the providing country has adopted a national ABS regulation with stricter rules, ensure to satisfy these rules.
- ✓ Before planning any sampling expedition in the water of a Coastal State, always ensure to contact the ABS National Focal Point.



## MaCuMBA Upcoming Events

### MaCuMBA 3rd General Assembly:

The **MaCuMBA** third General Assembly will be hosted by project partner Matís in the Marine Research Institute ([www.hafro.is/index\\_eng.php](http://www.hafro.is/index_eng.php)) in Reykjavik, Iceland. Project partners from all 22 institutes will attend this three-day event comprising scientific presentations, poster presentations and project workshops. The participants will then have the opportunity to sample the shores of Iceland during a two day sampling workshop.

### MaCuMBA Final Symposium:

**MaCuMBA** will host a joint industry conference and open science meeting on the biotechnical application of marine microbes. The conference - 'The Marine Microbiome - Discovery & Innovation' - will bring the industrial and scientific worlds together. It will take place in Berlin-Adlershof, Germany's leading science and technology park, from 27-30 June 2016. This event should not be missed as it will feature attractions including: an interactive industry exhibition featuring **MaCuMBA** 'hardware'; round table discussions (on the cultivation of microorganisms, the potential of marine microbiology for industry, the future of synthetic microbiology and the global effects of legislation on marine biodiscovery); moderated panel discussions; one-to-one meetings; and excellent networking opportunities. Further details about this exciting event will be released in the coming weeks. For more information, please email [marieke@aquatt.ie](mailto:marieke@aquatt.ie).



### The 9th European Marine Natural Products Conference (ECMNP 2015):

The 9th European Marine Natural Products Conference (ECMNP 2015) will be held at the Technical Innovation Centre (TIC), University of Strathclyde, Glasgow, Scotland from 30 August – 2 September 2015. This is expected to be the 'must attend' conference in 2015 for young researchers

in the field of marine natural products not only from Europe but around the world. Senior experts and rising stars of the future will present their work in a mixture of plenary and poster sessions. The main objective of this conference is to stimulate engagement of young scientists in the research area as well as to make their involvement a priority in the field. [www.ecmnp2015.com](http://www.ecmnp2015.com)

A free-of-charge pre-conference workshop will take place on the 30 August and will be organised by PharmaSea, BlueGenics, SeaBiotech, **MaCuMBA** and Micro B3. This workshop will facilitate exchange methodologies in an interactive way between young academics and experts of the five consortia. The following sessions are planned: Genomic Databases (Micro B3); Culture Management (**MaCuMBA**); Dereplication and Chemical Databases (PharmaSea and SeaBioTech); and Bioprocessing and Biopolymers (Bluegenics and SeaBiotech). To register for the workshop please visit:

[www.pharma-sea.eu/ecmnp-workshop.html](http://www.pharma-sea.eu/ecmnp-workshop.html)



### Biomarine Business Convention 2015:

Biomarine Business Convention 2015 will focus on the Biomass Bioconversion for Protein, Oil and Mineral Recovery. It will take place in Wilmington, North Carolina, USA from 12-14 October 2015. With an announced shortage of protein, the food and nutrition industry is looking for alternatives and we have some. This year you will debate about biomass bioconversion for protein, oil and mineral recovery. Biomarine 2015 will also dive into marine ingredients utilisation for nutraceuticals and cosmetics, explore the new developments in bio-remediation using seaweed and micro algae, address the breeding and genetics issues in aquaculture, and learn about biomaterials and bioplastics.

For more information, please visit: [www.biomarine.org/wilmington2015](http://www.biomarine.org/wilmington2015)

**MaCuMBA Project News** is a newsletter service provided by AquaTT within the framework of the **MaCuMBA** project. The newsletter provides updates on the **MaCuMBA** project and relevant items related to marine microorganisms. The newsletter is published on a quarterly basis and is archived on the **MaCuMBA** website: [www.macumbaproject.eu](http://www.macumbaproject.eu). Please submit any relevant information for inclusion in the next issue to [marieke@aquatt.ie](mailto:marieke@aquatt.ie)

