

## EMBRIC News

### EMBRIC Press Release

#### **Marine Biotechnology as Integral Part of the Circular Bioeconomy**

*The 11th European Forum for Industrial Biotechnology & the Bioeconomy (EFIB) attracted around 240 companies and stakeholders from 31 nations. The participants came to Toulouse to discuss and demonstrate that innovative approaches to some of the most pressing challenges worldwide exist and can be technically implemented. For the first time in EFIB history, the event had a dedicated section on marine biotechnology. EMBRIC used this momentum to join the conference and to highlight the potential of the blue biotechnology. And the marine focus was not limited to the speakers' sessions – two innovative marine start-ups presented their ideas at the start-up village of the event.*

Lise Kingo, CEO of the United Nations Global Compact, started the opening session of EFIB highlighting one pressing challenge, namely that the world is currently heading for a future in which the “oceans will have more plastics than fish”, a scenario which should incentive “to stop making business as usual”. Responding to this, Wolfgang Burtscher, Deputy Director General, DG Research & Innovation from the European Commission underlined the potential of a sustainable circular bioeconomy including carbon neutral green technologies, closed-loop production and new protein sources. From an investor or company point of view one of the main obstacles to the much needed bio-based innovation remains the difficulty to get paid for a sustainable product, which usually has higher production costs than its established competitors.

In the marine biotechnology track, companies, investors and cluster projects such as EMBRIC continued to debate the most important “blue challenges” of the future. Among them: increasing societal acceptance for products from the sea, meeting customers' expectations and optimizing the still young products. It was also demonstrated that marine resources build the basis for products in very different industrial markets, ranging from human care and cosmetics, animal and human nutrition, medical technology up to new marine-based colours for the textile industry or alternatives for pesticides in agriculture. Discussions during the track also highlighted the challenges for SMEs to enter into these markets, in particular with regard to new food ingredients that fall under the Novel Food Regulation.

For this reason, it was agreed that stakeholders in the marine biotechnology science and business area need platforms for exchange. Bernard Kloareg, director of the Roscoff Marine Station and project leader of EMBRIC counts on closer cooperation, he wants to “create an alliance between peripheral maritime regions” in which research infrastructures play a leading role in supporting the sustainable use of marine bioresources. And the ocean discussions were not confined to the marine session – its pollution and the careful use of its diverse resources triggered debates all over the different EFIB tracks.

Both the PitchFest and the newly introduced start-up village witnessed innovative, close to market industrial biotech solutions. Ingmar Høgøy, chairman of the start-up AlgaePro stated during his pitch: “Our vision is to be part of a new international industry within a circular bioeconomy”. AlgaePro produces microalgae using CO<sub>2</sub> from oil refineries, nutrient from fish farms and energy from process water to create new sources for renewable food production and satisfy the rising global demand for marine oils and proteins. Hoekmine, another blue biotech SME which joined EFIB 2018 on the initiative of EMBRIC, focuses

on biomimetics – the company copies structural colour from marine bacteria to translate into coloured materials. These new colours allow a higher intensity of colours, are free of dangerous solvents, use less energy and water and still outperform natural dyes. Colin Ingham, CEO of Hoekmine, participated at the start-up village and summarized after the event that “being a small company, participating at EFIB was an opportunity to network with business sectors that we normally do not reach”.

Not only is the blue biotechnology gaining grounds in the industrial biotech community, but it also plays an increasingly important role in the European bioeconomy debate. On October 22nd, the updated [European bioeconomy strategy](#) was presented in Brussels, including a focus on “Oceans and the Blue Bioeconomy”.



Picture credits: EFIB



## Genomic Tools and Selective Breeding in Molluscs

*An EMBRIC review on shellfish genomic resources and selective breeding was published in [Frontiers in Genetics](#)*

Picture copyright: Gabriella Luongo

In the review, the characteristics of the life history and genetics of molluscs including high fecundity, self-fertilization, high genetic diversity, genetic load, high incidence of deleterious mutations and segregation distortion are analysed, and their impact on the design and effectiveness of selective breeding strategies critically assessed.

A survey of the results of current breeding programs in the literature show that selective breeding with inbreeding control is likely the best strategy for genetic improvement of most molluscs, and on average growth rate can be improved by 10% per generation and disease resistance by 15% per generation across the major farmed species by implementing individual or family-based selection. Rapid advances in sequencing technology have resulted in a wealth of genomic resources for key species with the potential to greatly improve hatchery-based selective breeding of molluscs. In this review, the range of genomic resources currently available for molluscs of aquaculture interest and discuss the bottlenecks is catalogued, including lack of high-quality reference genomes and the relatively high cost of genotyping, as well as opportunities for applying genomics-based selection.

[Read the article in \*frontiers in Genetics\*, 18 July 2018 \(link\)](#)



## The EMBRIC Configurator is at your service, marine experts and scientists

*Do you have marine data, metadata and/or samples? Would you like to know how to use available data resources more widely?*

The EMBRIC Configurator team from the European Bioinformatics Institute (EMBL-EBI, UK) presented the marine data consultancy service in Heraklion on the 20th of September to eight interested people from the Hellenic Centre for Marine Research (HCMR) – just after the 3rd EMBRIC General Assembly. Participants of the session were curious to learn more about the completed configurations and inquired about available resources which could be used for a broad variety of their data, from metagenome and metabolic profiling to cyanobacteria genome assemblies.

An important aspect of the data consultancy service: “Configurations” are highly specific to each individual request and the recommendations regarding the elements of infrastructure and capacity (databases, tools, curatorial team) are specifically selected and provided for the request. **If you would like to try out how this service fits your individual requests, please don't hesitate to get in touch with the Configurator team at [annalisa@ebi.ac.uk](mailto:annalisa@ebi.ac.uk).**

## Discover our results



### **EMBRIC World Aquaculture Workshop: Off the shelf solutions for Fin-and Shell-fish Selective Breeding**

EMBRIC held a successful workshop at the Montpellier World Aquaculture Society meeting attended by over 3000 participants. The one-day session entitled “Off the Shelf Solutions for Fin- and Shell-Fish Selective Breeding” was organised under the remit of the Company Forum, which is designed to encourage closer contacts between the aquaculture industry and European research networks and infrastructures. About 50 participants took the opportunity to join the EMBRIC workshop.

#### **A day full of interesting presentations**

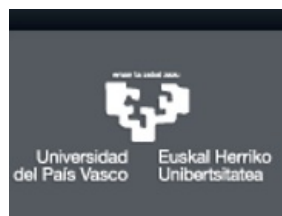
Keitaro Kato from the Kindai University in Japan presented an initial review of breeding and industrialization in Marine fish aquaculture. He outlined the

advances made in various marine species in Japan and was able to show that over a selective breeding programme encompassing 30 years a steady increase in production numbers can be achieved. Antonio Colli (Selonda) spoke next and looked at the industrial requirements for selective breeding in sea bream and sea bass from the Mediterranean perspective. Concretely, he examined the costs within the industry and the aims of breeding programs to elevate intrinsic growth rates and the adjustment to new feeds. He also had some valuable feedback from the industry with regard to how a further financing of selective breeding programs could be achieved. With the main theme of the workshop being "off-the-shelf solutions", Stylianos Kyriakidis (Xelect Ltd) illustrated the development of high throughput amplicon sequencing pipelines for haplotypes for parentage assessment in aquaculture breeding. This approach allowed a real insight into the need for accurate data acquisition and analysis to determine breeding programs. Ian Johnstone (Xelect Ltd) continued by giving his vision for the future of genetic selection programs and examples taken from his own company's developments over the last few years, with phenotypic selection, family selection, MAS genomic selection and finally to precision breeding. Last but not least, chairman Chris Bridges (TUNATECH, GmbH) took a broader perspective and reviewed the results of the previous workshops in Edinburgh and Bergen. During the entire session, the SLIDO system was used for questions and polls, which contributed to an active debate in the room and online.

### Reaching out to the network - beyond the workshop

During the three days of the meeting EMBRIC members engaged in discussions at the stand at the world aquaculture society trade display. The team disseminated publicity material for EMBRIC programs and the SME's involved in the work package for selective breeding. EMBRIC's video was viewed together with clips illustrating the activities of the partners.

## Get to know ...



### Universidad del País Vasco

The University of the Basque Country is the main research institution in the Basque Autonomous Community, carrying out 90% of the basic research in the region. The university is 30-year-old institution with 45,000 students and 5,000 academic staff. EMBRIC had the pleasure to welcome the university in January 2018 and is now composed of 29 partners. The University of the Basque Country will be accessible as Access Provider in EMBRIC in the Transnational Access Program.

## Open Calls



### EMBRIC Training

#### Final call open now!

Funding call for training organisers in marine biotechnology & aquaculture innovation  
Deadline: 19 November 2018

[More information](#)

#### EMBRIC funding call eligibility criteria:

- Up to 3500€
- Proposals can involve organisations outside EMBRIC
- One EMBRIC partner should co-organise

- Only actual costs linked to the training, its venue, its training material and the finalization of its outcome
- Innovative training approaches are welcome
- Collaboration with industry & policy is encouraged
- The training must take place before May 2019

**Amongst others, training activities can tackle:**

- Standardised procedures for discovery, development and exploitation of resources
- Novel technical enhancements for generating marine derived products
- Methods and developments in computational resources
- Innovation dynamics, technology transfer (TT) and value creation in blue biotech
- Transnational access (TNA) and access benefit sharing (ABS)
- Human capacity building (HCB) and transferable skills
- Intellectual property (IP), governance and policy



**CORBEL Open Call**

The CORBEL Open Call invites researchers to apply to access technologies and services from more than 20 facilities from 10 different research infrastructures across Europe.

Selected projects will gain unprecedented opportunities to utilise a wide range of high-end technologies and services. These include state-of-the-art offers from the fields of advanced imaging, biobanking, clinical and translational research, curated databases, marine model organisms, mouse mutant phenotyping, high-throughput screening, structural biology as well as systems biology. Costs for travel to partner sites will be reimbursed by CORBEL and access to service providers will be granted without access fee (extra costs for consumables may apply). Projects will be supported at every stage, with CORBEL project managers helping scientists to navigate between different service providers and exploit the full potential of the offers available. To support industry projects, the CORBEL consortium also launched an Innovation Office, consisting of a well-experienced team dealing with the specific needs of industry when applying to this Open Call (e.g. regarding IP issues or confidentiality agreements).

**The next deadline for applications is 31 October 2018.**

[Learn more about the CORBEL Open Call \(link\)](#)

**Upcoming EMBRIC events**

- **EMBRIC Workshop and Breakfast Meeting "Treasures from the Deep"**, 5 March 2018 in Brussels, Belgium

**Other upcoming events**

- Biomarine Business Convention in Cascais, Portugal, 2 - 4 October 2018
- The CORBEL Medical Infrastructure/Users Forum (MIUF), 15 October 2018, Paris (France)
- International Congress for Marine Biotechnology, 17 - 20 October 2018 in Monastir, Tunisia

- EuroMarine Steering Committee meeting, 31 October 2018, Paris (France)  
: [More information](#)
- CABI training course: Isolation and identification of environmental fungi, 13 - 15 November 2018. The course will take place at CABI, Bakeham Lane, Egham, Surrey, TW20 9TY, UK  
[More information](#)
- Blue Growth Mid-term Conference, 22 - 23 November in Brussels  
[More information](#)
- Hands-on workshop in Marine Metagenomics, 26 - 30th November (09.00 - 16.00), The Arctic University of Norway, Deadline for registration 1/11/2018 [here](#)
- 'Responsible aquaculture development for food security and economic progress' training course, November 26 - December 14, 2018, Wageningen University, the Netherlands  
[More information](#)
- Responsible aquaculture development for food security and economic progress' training course, 26 November - 14 December, 2018, Wageningen (Netherlands)
- EOOS Conference "Evolving EOOS: Connecting communities for end-to-end solutions, 21 November - 23 November, 2018, Brussels (Belgium)
- CAPTURE International Year of the Reef Colloquium, 1 November - 2 November, Bremen (Germany)
- 53rd European Marine Biology Symposium, 17. November - 21. November, Ostend (Belgium)
- Conference on the Research Infrastructures and the Paris Agreement on climate, 20 November - 21. November, 2018, Brussels (Belgium)
- Blue Invest in the Mediterranean 2019, Malta 24 January 2019 - Call for expression of interest to pitch

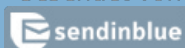
EMBRIC project  
<http://www.embric.eu/>



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