



# Marine Micr'Omics for Biotech Applications

## 2<sup>nd</sup> Industry Expert Workshop

### A Joint Dissemination Activity by the EU Projects

#### Micro B3, MaCuMBA and PharmaSea

Pharma Mar S.A., Avda. De los Reyes, 1, Poligono Industrial La Mina-Norte

Colmenar Viejo, Spain

30 - 31 March 2015

#### FINAL PROGRAMME

### Monday, 30 March 2015

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|--------------------|---|
| <b>12.00-13.00</b> | <b>Registration and Finger Food to start Networking</b>                         |
| <b>13.00-14.10</b> | <b>Welcome and Introduction (Johanna Wesnigk)</b>                               |
| 13.00-13.30        | Showing of 20-min Micro B3 documentary film; logistics                          |
| 13.30-13.40        | Simon Munt, on behalf of PharmaMar: Welcome of the host                         |
| 13.40-13.50        | Frank Oliver Glöckner, Jacobs University Bremen: Short introduction to Micro B3 |
| 13.50-14.00        | Lucas Stal, NIOZ, Yerseke: Short introduction to MaCuMBA                        |
| 14.00-14.10        | Marcel Jaspars, Univ. Aberdeen: Short introduction to PharmaSea                 |

### 14.10-16.10      **Session 1: Natural products based on marine biodiversity**

**Chair: Fernando de la Calle, PharmaMar**

*This session will present real cases of*

- *the current strategy of drug discovery using marine organisms*
- *genomic mining into the universe of microbial biodiversity*
- *the designing of unnatural new compounds by genomic manipulation*
- *present & future trends in drug delivery of marine compounds*

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| 14.10-14.35 | Carlos Pedrós Alió (ICM-CSIC, ES): Genes from the ocean: the case of proteo-rhodopsin |
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- 14.35-15.00 Jose Antonio Salas (Univ. of Oviedo): Engineering biosynthetic pathways for antitumor compounds in marine actinomycetes
- 15.00-15.25 Fernando Reyes, (Fundación MEDINA, ES): Exploiting a collection of marine actinomycetes as source of new bioactive molecules
- 15.25-15.50 Beatriz Galán (CIB, CSIC, ES): Marine bacterial didemnins and the harmony of their biosynthetic gene cluster
- 15.50-16.10 Simon Munt, (PharmaMar, ES): Marine Natural Products: Is the best yet to come?

**16.10-16.30 Short break**

**16.30-19.00 Short information on logistics (Johanna Wesnigk, EMPA)**  
**Session 2: Environmental biotechnology through marine microbial knowledge**

**Chair: Juan Luis Ramos, Bio-Ilberis and Abengoa**

*Molecular biology tools have first been used to understand the biology of a number of microbes cultivated in the laboratory. Then efforts brought this set of techniques to the study and understanding of microbes inhabiting different environments, and a number of reports proved that all niches explored on Earth are inhabited by microbes. Especially metagenomics and meta-proteomics techniques are revealing a wealth of unexpected functions while also explaining the adaptation of microbes to extreme environments. A number of the enzymes from oceanic metagenomic libraries are revealing potentially new applications in industry. In this session we intend to explore some of the approaches and how enzymes of industrial interest can be rescued and evolved.*

- 16.30-16.55 Alexander Wentzel (SINTEF, NO): Comparative metagenomics and bioprospecting of deep sub-surface oil reservoirs on the Norwegian continental shelf
- 16.55-17.20 Manuel Ferrer (CSIC-ICP, ES): Re-directing biotech opportunities through metagenomics
- 17.20-17.45 Jose Miguel Seoane (REPSOL, ES): Model-driven multi-scale optimization of microbial cell factories
- 17.45-18.10 Pablo Pomposiello Miravent (CEO BAcMine, ES): Ligand responsive circuits, synthetic biology and bioprocesses
- 18.10-18.35 Juan Luis Ramos (Abengoa, ES): Discovering enzymes of industrial interest from marine metagenomic libraries
- 18.35-19.00 Discussion on marine and environmental biotechnology

***The shuttle bus will leave at 19:15 for Colmenar Cercanias station***

**21.00 Joint workshop dinner in the city restaurant, Café del Principe, Plaza de Canalejas, 5 / Calle del Principe, 28014 Madrid (Center). Closest Metro Stations: Sevilla & Sol ([www.cafedelprincipe.com](http://www.cafedelprincipe.com))**

**Tuesday, 31 March 2015**

**Two shuttle buses will leave Colmenar Cercanias station at 8:35 and 8:50**

**9.00 -10.30      Session 3: Bioinformatic tools and methods for innovative blue biotechnology**

**Chair: Renzo Kottmann, Max Planck Institute for Marine Microbiology**

*This session will present and discuss new developments in bioinformatics algorithms, tools and standards for the (meta)-genomic identification and analysis of unknown genes and biosynthetic gene clusters that are relevant for marine biotechnology. The discussion will focus on what is needed to bring bioinformatics closer to biotechnology applications, by accelerating the industrial utilization of newly developed methods and by filling gaps in the knowledge transfer between academia and industry.*

09.00-09.25      Marnix H. Medema, (University of Wageningen): Computational genomic strategies and standards for natural products discovery and engineering

09.25-09.50      Antonio Fernandez-Guerra, (Univ. Oxford): Computational approaches to biodiscovery in metagenomes

09.50-10.15      Tom van den Bergh (Bio-Product, NL): Protein superfamily data integration for protein engineering

10.15-10.30      Discussion on bioinformatics tools for biotechnology

**10.30-11.00      Break**

**11.00-12.30      Session 4: New strategies for high throughput isolation of novel marine microorganisms**

**Chair: Lucas Stal, NIOZ**

*This session will discuss new strategies for the isolation and cultivation of novel marine microorganisms and the importance and problems of their deposition in accessible culture collections. The session will also discuss the possibility of using 'omics' approaches for targeted isolation of specific microorganisms based on their predicted biotechnological applications. Issues regarding intellectual property rights and rights to marine genetic resources including microbial cultures, and consequences of implementating the Nagoya Protocol to the CBD by the European Union will be presented for further discussion.*

11.00-11.25      Joerg Overmann, (DSMZ, DE): Accessing and securing novel marine microbial resources through cultivation

11.25-11.45      Colin Ingham, (MicroDish, UK): Microengineered chips based around porous aluminium oxide for microbial cultivation.

- 11.45-12.05 Helena Vieira (University of Lisbon): Discovering the unknown - how to drive research for marketable biotechnological applications of novel marine microorganisms
- 12.05-12.30 Caroline von Kries (University of Bremen): Points to consider for framing a Model Agreement for Access to Genetic Resources and Benefit Sharing
- 12.30-13.30 *Departure logistics and Lunch on the premises***
- 13.30-15.00 **Panel Discussion: Bioactives of marine origin – opportunities and challenges****

**Moderator: Marcel Jaspars, co-moderator Johanna Wesnigk**

*A panel formed by participants from industry and EU project partners will discuss opportunities and challenges in the use of bioinformatics and genomics tools for discovering new marine bioactives relevant for pharmaceutical and other biotechnological applications.*

Please note that panelists will be selected from the persons named above and the participants to ensure wide-ranging input.

**15.00 **Closure of the workshop (F. de la Calle and J. Wesnigk)****

*t.b.d. Earlier transfer to Colmenar Cercanias station and shared taxis to airport can be arranged, if necessary.*

**15.15 **Final shuttle bus to Colmenar Cercanias station****