MARISTEM COST network

Who we are, what we do:

MARISTEM network: 45 institutions including Universities, Research Institutes and Companies from 25 EU or EU-associated countries. (*http://maristem.eu/, maristem@bio.unipd.it)*

Rationale: The huge biodiversity of marine organisms, particularly among the invertebrates, is an underexplored field for the discovery of new products of interest for medical or biotechnology applications: antimicrobial, anticancer, adhesive biomolecules, enzymes…
On the other hand, the "stem cells" discipline, which opened a wide range of new applications in biomedicine and biotechnologies, has poorly investigated marine organisms.
Putting forward Marine and aquatic Invertebrate Stem Cells (MISC) will unlock a promising field for R & D.

MARISTEM objectives: develop, consolidate and foster an international interdisciplinary network of both researchers and industries to promote the MISC discipline.

A prerequisite: a strong collaboration between experts from research institutions and industries in order to exploit all opportunities provided by life in ocean.

What we offer:

An expertise in Marine Biology: the more advanced research laboratories working on the biology of invertebrates in Europe

A forum to discuss your ideas or your needs in the field of Marine invertebrates-based biotechnologies.

A source of collaborative projects aiming to develop new approaches or to produce new compounds.

How to join us:

A year round open mail contact for stakeholders: cost-maristem@obs-banyuls.fr

An annual open meeting: the next one in **November 2019**.

Organisation and governance:

General Assembly

38 members (M0s) in 25 countries

L. Ballarin
Chair

Scientific coordination

B. Rinkevich
Vice-chair

Management committee – Scientific committee

Scientific activities

Wg1
Developing protocols for raising MISC under *in vitro* conditions

Wg2
"-omics" to characterize the MISC phenotypes

Wg3
Blue technologies

Wg4
Networking with stakeholders

2018 Activities:

2nd General MARISTEM Meeting-Banyuls-s/-Mer (France, November 28-29 2018)

Nine months after the kick-off MARISTEM meeting in Piran (Slovenia, February 2018), where members presented their research field and their more recent results, a joint meeting was organized with stakeholders in Banyuls-sur-Mer.
The high potential of applications of MISCs was discussed: human health, pharmaceutics, neutracetics, cosmetics, antifouling.

A large set of natural products, antimicrobial, anticancer, adhesive biomolecules, opsonins, enzymes.... are indeed produced by the investigated model organisms: sponges, cnidarian, echinoderms, molluscs or tunicates. Improvement in identification, characterization and *in vitro* methods for culture of MISCs were discussed and strategy was set up to develop connections with relevant biotech industries. In addition the consortium has worked on the next review to be published soon on the natural compounds/bioactive molecules produced by marine invertebrates.
For published abstracts see: http://www.isj.unimo.it/index.php/ISJ/article/view/494

Workshop: Use of Marine Invertebrate Cells and Stem Cells in Ecotoxicology

Banyuls-s/-Mer (France, November 27, 2018)

Marine invertebrates have found widespread use in toxicity testing mainly due to the ease of maintaining them in the laboratory under controlled conditions. But the development of invertebrate-based bioassays has recently been stimulated by the enforcement of 3R testing approaches. Both whole organisms and isolated cells have been used with the most popular groups of organisms being shellfish, echinoderms and more recently ascidians. As a consequence, numerous biomarkers with different specificity and sensitivity have been developed. Now, a decisive step forward toward an even wider use of these toxicity tests would be taken with the introduction of MISCs.

The objectives of this workshop was to assess the current situation in this field, to define advantages and drawbacks of MISC based bioassays and to discuss strategies toward their development

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1st International Summer School, Tricase (Italy, October 1-5 2018)

An integrated approach to marine invertebrate biodiversity: evolutionary and functional adaptations

This Master Course Program (4 ECTS) supported by MARISTEM aimed to raise interest among students on invertebrate biology and its widespread applications. Biology and evolution knowledge of adaptive strategies and developmental patterns of marine invertebrates is mandatory for the comprehension of the organism-environment interactions and the functioning of marine communities. The scientific themes addressed during the school covered comparative analysis of main adaptive

strategies across several invertebrate phyla. The summer school was organized in the framework of a joint agreement of academic cooperation between the Universities of Milan, Padoa, Palermo, and Salento (Lecce). This international meeting provided the opportunity for exchanges between students of different European universities.

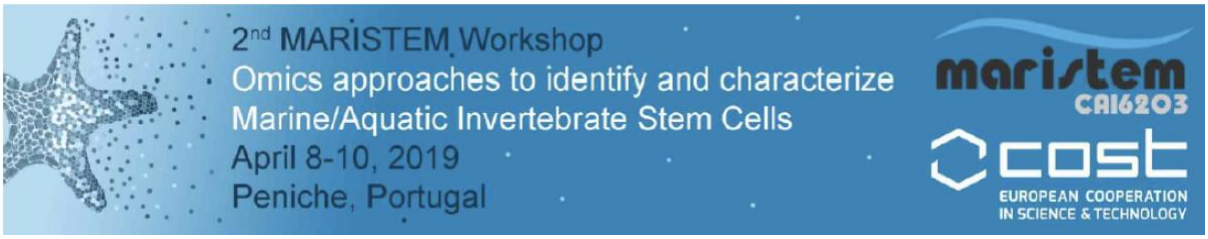
What's new and happening:

Workshops:

Marine invertebrates adult stem cells, Innsbruck (Austria March 28-31, 2019)

Topic: comparison of adult stem cells (ASC) between marine invertebrates and vertebrates (mainly mammalians) with the aim to elucidate similarities and differences between the phyla. The objective is to produce a conceptual viewpoint on the status of ASC in multicellular organisms. Fifteen participants including leading researchers in the stem cells area.

Omics approaches to identify and characterize Marine/Aquatic Invertebrate Stem Cells, Peniche (Portugal, April 8-10, 2019)



This workshop will be attended by 20 PhD students from the MARISTEM European member countries. It aims at:

- Extend the knowledge of participants on omics approaches
- Teach strategies for the identification of invertebrate stem cells
- Evaluate the adjustments required to adapt these strategies to marine invertebrates
- Establish a scientific network supporting omics approaches in the MARISTEM action.

This workshop will be composed of three plenary lecture sessions alternated with round-tables and informal discussions. During these interactive activities, the students will have the opportunity to ask for inputs from the various speakers on their respective omics research challenges. The main topics of these sessions will be:

- General approaches for omics experiences
- Stem cell characterization by omics approaches
- Combining experimental approaches to identify stem cells.