

NEW TRENDS IN MARINE BIOTECHNOLOGY AT CIIMAR

Vitor Vasconcelos^{1,2} and Susana Moreira¹

¹ Interdisciplinary Centre for Marine and Environmental Research – CIIMAR, Rua dos Bragas, 289
4050-123 Porto, Portugal
E-mail: vmvascon@fc.up.pt

² Faculty of Sciences, Porto University, Rua do Campo Alegre, 4069-007 Porto, Portugal

CIIMAR - Interdisciplinary Centre of Marine and Environmental Research – (www.ciimar.up.pt) is a research and advanced training institution associated to the University of Porto. It develops high-quality research, promotes technological development and supports public policies in the area of marine and environmental Sciences. CIIMAR hosts 18 research groups, in 5 research lines, with a scientific staff of more than 250 researchers (125 PhD holders) with diverse backgrounds. CIIMAR contributes to the understanding of the biological, physical and chemical processes in the ocean and the coastal zones, to the sustainable use of aquatic resources and the evaluation of the impact of human activities on ecosystems. CIIMAR generated 700 publications in SCI-indexed journals in the last 3 years. Marine biotechnology is one of the main CIIMAR research areas, having our researchers collaborated in the ESF position paper that reported a new vision and strategy in this field (Borrensens *et al.*, 2010). Natural products of marine origin, from cyanobacteria, fungi and sponges, have been studied at CIIMAR with the aim of finding new drugs such as anticancerogens (Almeida *et al.*, 2010) or anti-viral (Lopes *et al.*, 2011) drugs. Bioactive compounds from cyanobacteria may have allelopathic activity with potential use to control algal blooms or as antifouling in the marine environment (Leão *et al.*, 2012). In the biomedical area we are also interested in the use of biological fluids such as those of *Anodonta cygnea* on the biomineralization of chitosan membranes (Lopes *et al.*, 2010). Fish aquaculture has been researched with the purpose of meeting the growing demand for sustainable and healthy seafood by designing new environmental friendly diets that also increase performance and quality of farmed fish (Cabral *et al.*, 2011, Pérez-Jiménez *et al.*, 2012). The potential use of naturally occurring microbial communities in bioremediation processes of hydrocarbons and emergent pollutants is also being studied (Almeida *et al.*, 2013). CIIMAR wants to improve its technology transfer pathway to stimulate cooperation with industry and seeks international collaboration in marine biotechnology in the framework of Horizon 2020, namely in 'Food security, sustainable agriculture, marine and maritime research and the bioeconomy' issues.

References

- Almeida A.P., T. Dethoup, N. Singburadom, R. Lima, M.H. Vasconcelos, M. Pinto, A. Kijjoa. 2010. The in vitro anticancer activity of the crude extract of the sponge-associated fungus *Eurotium cristatum* and its secondary metabolites. *Journal of Natural Pharmaceuticals* 1:25-29.
- Almeida M.R., I. Reis, M.N. Couto, A.A. Bordalo and A.P. Mucha. 2013. Potential of the microbial community present in an un-impacted beach sediment to remediate petroleum hydrocarbons. *Environmental Science and Pollution Research*. (in press)
- Borrensens T., C. Boyen, A. Dobson, M. Höfle, A. Lanora, M. Jaspars, A. Kijjoa, J. Olafsen, J. Querellou, G. Rigos and E. Wijffels. 2010. Marine Biotechnology: A new vision and strategy for Europe. *Marine Board-ESF Position Paper* 15:1-91.
- Cabral E.M., M. Bacelar, S. Batista, M. Castro-Cunha, R.O.A. Ozório and L.M.P. Valente. 2011. Replacement of fishmeal by increasing levels of plant protein blends in diets for Senegalese sole (*Solea senegalensis*) juveniles. *Aquaculture* 322-323:74-81.
- Leão P.N., N. Engene, A. Antunes, W.H. Gerwick and V. Vasconcelos. 2012. The chemical ecology of cyanobacteria. *Natural Products Reports* 29:372-391.
- Lopes A., M. Lopes-Lima, I. Bobos, J. Ferreira, S. Gomes, R. Reis, J. Mano and J. Machado. 2010. The effects of *Anodonta cygnea* biological fluids on biomineralization of chitosan membranes. *Journal of Membrane Science* 364:82-89.
- Lopes V.R., M. Schmidtke, M.H. Fernandes, R. Martins and V. Vasconcelos. 2011. Cytotoxicity in L929 fibroblasts and inhibition of herpes simplex virus type 1 Kupka viruses by estuarine cyanobacteria. *Toxicology in Vitro* 25:944-950.
- Pérez-Jiménez A., H. Peres, V. Cruz Rubio and A. Oliva-Teles. 2012. The effect of dietary methionine and white tea on antioxidant defenses and oxidative damage of *Sparus aurata*. *British Journal of Nutrition*. 108(7):1202-120.