

## Editorial – preview

The vast chemical diversity of the oceans, revealed in full by recent screening molecular tools, opens new, exciting scenarios for research, which bring together some of the best brains in marine science and in the business. As much of sea life – particularly in deep waters – is still untapped, the exploitation of ocean diversity for industrial and medical purposes yields vast promises, reflected in the emergence of marine ('blue') biotechnology as a dynamic, fast-growing economic sector.

Advances in marine -omic research are coming from diverse disciplines and generate numerous, valuable information that are badly in need of integration on the way to product commercialization. These points were highlighted during the CIESM-NSF/EC Workshop 'Marine Genomics: at the Interface of Marine Microbial Ecology and Biotechnological Applications' that took place in Monaco on 12–14 October 2008. This forum gathered some 40 international experts from the academic and industrial sectors, including researchers from both northern and southern shores of the Mediterranean who took an active part in the Panel discussions. The ideas and guidelines derived from this meeting are accessible online at [http://ec.europa.eu/research/biotechnology/ec-us/workshop\\_past\\_en.html](http://ec.europa.eu/research/biotechnology/ec-us/workshop_past_en.html) and it was agreed, at the proposition of CIESM, to further develop some of them in a special issue of MBT issue in order to complete the Workshop Report – mostly policy-oriented – with original results from the research front.

This volume is the outcome of this proposal, illustrating with a few, non-exhaustive examples, the richness and diversity of issues – from bioprospecting, bioinformatics to benefit sharing – that are legitimately clustered under the 'blue biotechnology' banner. Its structure is designed to sensitize the reader to the need of integrating many distinct threads, including some that might appear at first way off-centre, in order to progress effectively along the biotechnology front.

Among those, the legal, economic and ethical implications have become key issues than can no longer be ignored, taking on a new dimension that is often controversial. They are covered in the first section, starting with the pros and cons of applying patents, viewed from two different perspectives: that of the IP service providers (Giugni and Giugni, 2010), and that of the industry (Tichet and Bloch, 2010). The issue of ownership of open sea genetic resources is further developed in an invited

opinion article (Gutnick, 2010) that proposes various policy-related options for negotiation.

The second section of this special issue includes selected examples of environment-related research, all based on the application of multidisciplinary approaches. They strongly illustrate the need to couple bioprospecting efforts with detailed records of major environmental parameters so as to clarify the role of specific processes, enzymes or metabolites in nature, and thus orient industrial application studies (Lanfranconi *et al.*, 2010, La Cono *et al.*, 2010). Clearly, the broad support that high-throughput studies of marine microbial diversity have received as providers of uncovered information, e.g. on new biogeochemical cycles, energy-coupling mechanisms, biotransformation, secondary metabolite and bioactive compound biosyntheses (Heidelberg *et al.*, 2010; Wecker *et al.*, 2010), is now accompanied by a welcome move to concentrate efforts on novel technologies that will allow the recovery and pure culture of a much larger fraction of the marine bacteria naturally found in the ocean (Joint and Querellou, 2010) than the 0.1% of today, which is certainly encouraging for the near future.

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