



SEAVENTzymes – Biotechnologically relevant extremozymes from deep-sea hydrothermal vents.

SEAVENTzymes-Searching for biotechnologically relevant extremozymes in a collection of prokaryotes isolated from deep-sea hydrothermal vents.

The SEAVENTzymes project aimed to exploit the biotechnological potential of a collection of extremophiles (ca. 250) isolated from deep-sea hydrothermal vents in the Azores sea during the portuguese mission SEAHMA-I. This collection includes psychrotolerant, mesophilic and thermophilic organisms and represents a privileged raw material for the search for new extremozymes.

The Challenge

In the scope of this project, prokaryotic isolates were characterized by a narrow-down strategy in terms of their potential for the production of extracellular hydrolytic enzymes including cellulases, xylanases, amylases, pullulanases, chitinases, mannanases, pectinases, lipases, esterases and proteases. Activity assays using chromogenic substrates, thermolability and pH performance of extracts and PCR detection of putative coding genes with degenerated primers were applied. In parallel, a search of new intracellular enzymes relevant for molecular biology (DNA polymerases, DNA ligases and Type II restriction endonucleases) was also performed in this collection. Main outputs of the project include a database harboring the gathered information, a sub-collection of biotechnology relevant isolates, a set of new designed primers for PCR screening, newly-adapted protocols and a bank of whole-cell DNA extracts.

Knowledge Output

- database on extracellular hydrolytic enzymes including data on Activity assays, thermolability, pH performance of extracts and PCR detection of putative coding genes with degenerated primers
- a sub-collection of biotechnology relevant isolates
- a bank of whole-cell DNA extracts

Potential Fields of Application

- Chemistry (detergents)
- Food industry (new nutrients source)
- Pharma and Cosmetic industries (secondary metabolites)
- Environment (bioremediation)
- Agronomy (fertilizers, animal food)

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This project is promoted by MG4U

MG4U at a Glance

Title: Marine Genomics for Users
Programme: FP7, Cooperation; Food, Agriculture and Fisheries, and Biotechnology (KBBE)
Instrument: Coordination and Support Action (Supporting)
Total Cost: € 1,120,000
EC Contribution: € 997,826
Duration: January 2011 – June 2013
Coordinator: Station biologique de Roscoff, Centre National de la Recherche Scientifique (CNRS), France
Consortium: 7 partners from 6 countries
Web: www.mg4u.eu

The Challenge

Cutting-edge genomic approaches are now sufficiently mature to significantly contribute to the knowledge based bio-economy in the marine sector. Marine genomics has enormous potential to improve our lifestyles and prosperity, and to assist with governance and sustainable management of the marine environment. Valuable knowledge needs to be made accessible to users and disseminated in user-friendly contexts. The clear needs for knowledge and technology transfer as well as technology translation between high-throughput marine genomics, industry and society will be implemented by the EU support action Marine Genomics 4 Users.

Project Objectives

Marine Genomics 4 Users (MG4U) responds to several critical bottlenecks. It will spread results from recent and on-going projects in marine genomics and enhance fast, efficient knowledge transfer to increase interdisciplinary research capacity in Europe. Scientists, government officials and representatives from small, medium and large enterprises are targeted for diverse transfer activities.

Partners for Collaboration

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Project Partners



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