

Joint **post-doctoral position** (18 months) between Ifremer¹ & IMR²
involving the University of Bergen³, CMR⁴ Computing and the SRC Basse-Normandie⁵

Scientific field research: bio-energetics of marine bivalves, mussel aquaculture, modelling

Blue mussel bioenergetics in aquaculture as modelled with DEB theory (Acronym: **BlueDEB**)

Abstract

In the context of sustainable mussel (*Mytilus edulis*) aquaculture in Norway and France, there is a need for a growth model of *M. edulis*, which can provide reliable quantitative growth predictions in various and contrasted trophic conditions (low and high seston concentrations) and temperature, and for different physiological states of mussels. The main scientific objective of the BlueDEB project is to provide a generic bio-energetic growth model of the blue mussel (*Mytilus edulis*) based on the Dynamic Energy Budget (DEB) theory, for the development of relevant biological indicators and interface tools for integrated management and sustainable development of shellfish farming. The project will be carried out by funding a 18-month post-doctoral position, for which a French or Norwegian candidate will be pursued. The post-doc period will be divided by 9 months stay in France and 9 months in Norway.

The objective will be accomplished through four sub-goals: 1/ revisiting and refining parameter estimation of the standard DEB model applied to *M. edulis*; 2/ testing and validating the mussel-DEB model for simulating mussel growth and reproduction in environments differing by their trophic and temperature levels (from French and Norwegian data sets); 3/ using the resulting mussel-DEB model for *i*) assessing energy allocation, growth and reproduction in contrasted environmental conditions, and for *ii*) producing biological indicators to evaluate the potential impact of mussels on ecosystem; 4/ transferring results for industrial applications by implementing the mussel-DEB model as a module in Geographic Information System (GIS) developed as operational tools for aquaculture management in key running projects in Norway and France.

As an ultimate purpose, the BlueDEB project will contribute to key complementary Norwegian and French projects: MOLO⁶/AkvaVis⁷ (System for adaptation to the environment and rational usage of area), and CANO⁸ (Carrying Capacity in Norwegian Aquaculture, 2006-2010) in Norway; OGIVE⁹ (Operational tools to sustain shellfish culture in Normandy, 2005-2013) in France. These three projects all rely on existing models at different scales (individual, population, ecosystem), but all face the lack of a robust bio-energetic growth model for the blue mussel at the individual level. Thus, BlueDEB will fill in this gap by providing a generic growth model at the individual mussel level, as well as relevant indicators to assess interactions between aquaculture and environment in different ecosystems in Norway and France.

Educational background and skills

PhD in marine biology/ecology with a strong background in mathematical modelling (e.g. parameter estimation) and statistical analysis; computer skills: Matlab, SAS; specific knowledge on ecophysiology/biology of bivalves (or terrestrial invertebrates or marine fish) are required. Adequate spoken and written English is also required.

Salary

Annual gross salary (before taxes) = 31682 euros (*i.e.* monthly net salary around 2000 euros).

¹ French Research Institute for Exploitation of the Sea, <http://www.ifremer.fr/francais/index.php>

² Institute of Marine Research, Bergen, <http://www.imr.no/>

³ University of Bergen, <http://www.uib.no/info/english/>

⁴ Christian Michelsen Research AS, Bergen, http://www.cmr.no/cmr_computing/index.cfm

⁵ French Regional Section of Shellfish Farmers in Basse-Normandie, <http://www.huitre-normandie.com/>

⁶ http://www.imr.no/english/search?search_mode=simple&action=Search&sort_mode=total_score&at_least_one_query=molo

⁷ <http://insitu.cmr.no/akvavis/req?REQUEST=MapTargets>

⁸ <http://www.imr.no/cano/start>

⁹ <http://www.ifremer.fr/lern/Pages/Programme/ogive.htm>

Contact: Dr. M. Alunno-Bruscia (Ifremer, Presqu'île du Vivier, 29840 Argenton-en-Landunvez, France), tel. : +33 (0) 298 89 5393, e-mail: malunnob@ifremer.fr

Duration: **18 months** with the first 9 months stay in France and the last 9 months in Norway (expected start date: 1 November 2008)

Locations: **Ifremer** Argenton (<http://www.ifremer.fr/argenton/>), France for the first 9 months stay; **Havforskningsinstituttet** (Institute of Marine Research, IMR <http://www.imr.no/english/main>) Bergen, Norway for the last 9 months stay.

Scientific supervisors/collaborators:
France: Dr. M. Alunno-Bruscia & Dr. A. Gangnery (Ifremer, France)
Norway: Dr. Øivind Strand (IMR, Bergen), Dr. Rune Rosland (University of Bergen), Anne A. Hageberg (CMR Computing)

Conditions of eligibility: Interested applicants should send their CV and names of 2 references to [M. Alunno-Bruscia](mailto:M.Alunno-Bruscia). Candidates should be either of French or Norwegian citizenships, less than 35 years old and should have obtained their PhD within the last 3 years. Candidates who would have received previously a PhD fellowship from Ifremer are not eligible. For more details about the conditions of application, see also the website of the Scientific and Technological Council of Ifremer: http://www.ifremer.fr/ds/animation_scientifique/bourses/postdoctorales/index.html

Deadline for application: 26 September 2008