MASTER THESIS OFFER (2013/14) MER

30 ECTS: **6 mo**

TITLE	**DESCRIPTION** (5-10 lines)	**SUPERV.** (Name; Contact e-mail)	**LOCATION** (Res Grp; Lab, Dept, Inst, City)	**FUNDING** (if available)	**REQUISITES / NAME** (if needed /if agreed)
Impact of Harmful diatom blooms in estuaries	There are several bloom forming diatoms in coastal and estuarine waters. Some of them are harmful for contributing to the oxygen decrease in the water whereas other are harmful for producing toxins. The study of these diatoms from different approaches (molecular, morphological, physiological) constitutes a challenge for improving estuarine ecological status	Emma Orive emma.orive@ehu.es Sergio Seoane sergio.seoane@ehu.es Aitor Laza aitor.laza@ehu.es	Dept of Plant Biology and Ecology UPV/EHU, Leioa.	Proyecto Grupos Gº Vasco	
A comparative study of xenoestrogenic response in four fish species: zebrafish, trout, thicklip grey mullet and sea bass.	Endocrine disrupters are pollutants that interact with the endocrine system of organisms by altering their development, reproduction and behavior. The best known endocrine disruption effects in the aquatic environment are feminization processes observed in males and immature fish. The study of these processes includes biomarkers such as transcription levels of vitellogenin in liver and cyp19a1b aromatase in the brain. The aim of this master thesis project is to determine the response sensitivity to a model xenoestrogen (ethynylestradiol) in four fish species used in endocrine disruption studies: zebrafish, trout, and thicklip grey mullet and sea bass. This work is part of a broader research project studying the effects of environmental contaminants on fish gametogenesis.	Maren Ortiz-Zarragoitia maren.ortiz@ehu.es	Cell Biology Environmental Toxicology (CBET) Res Grp. UPV/EHU, Leioa/Plentzia	SEXOVUM res. proj, consolidated res gr CBET, UFI Ecosystem Health Protection	interest in Cell Biology
Impact of mortality by predation on early life stages of European sardine (*Sardina pilchardus*) using molecular methods	European sardine (*Sardina pilchardus*) is an economically important fishery resource. Until recently the stock assessment and the determination of fishery quotas was solely based on fishery capture records; nowadays, the Daily Egg Production Method (DEPM), base of the European anchovy (*Engraulis encrasicolus*) stock assessment since the 80s, is being implemented as a parallel strategy to improve the management of the resource. However, aiming the ecosystem based management (EBM) of the fishery, fish production measurements (DEPM) has to be combined with mortality ones including not only fishery capture ones but natural mortality. In this sense, although little is known about the factors which lead to large differences in recruitment in different year classes, it is generally accepted that predation, along with transport, feeding success and diseases, is a major cause of mortality during the early life history stages of fish, and predation may generate variability in the recruitment of fish species (e.g. Van der Veer & Bergman 1987, Bailey & Houde 1989, Bailey 1994, Bunn et al. 2000). The research will focus on one aspect of fish mortality: predation of early life stages of sardine by marine invertebrates (macrozooplankton) during its spawning season in the Bay of Biscay. If we know which species are responsible for egg/larvae mortality, we might be able to predict recruitment, based on the abundance of these predators in the vicinity of the spawning and nursery grounds. In this sense, there are invertebrate organisms such as chaetognaths and euphausiids that are also potential predators of sardine's egg and larvae (Theilacker et al. 1993, Krautz et al. 2007, Terazaki 2005, Albaina et al. in prep.) and that may be playing a role. However, we do not have the tools to evaluate the frequency of those sources of predation. In the case of invertebrates, accurate identification of fish eggs, larvae and juveniles in the stomach contents is extremely difficult if possible; many invertebrates, particularly the crustacea, macerate their prey making identification nearly impossible. To overcome this, a growing number of studies have employed molecular methods now making possible the identification of target species in the guts of predators (e.g. reviews in Symondson 2002 and King et al. 2008). In this sense, the candidate will implement and apply a DNA based method to quantify the predation impact on	Aitor Albaina aitor.albaina@ehu.es Andone Estonba andone.estonba@ehu.es	Genetics lab. UPV/EHU	consolidated res gr	Experience in DNA handling, PCR, sequencing MEGA, BIOEDIT, BLAST/ENTREZ, etc…) Experience in Marine ecology and fisheries

	sardine early life stages by identifying sardine remains in the potential predators' stomach contents. Molecular identification of prey in the stomachs of predators can provide important information on trophic interactions that may be difficult if not impossible to obtain in any other way. The proposed research subject to be developed by the candidate is of policy relevance because it addresses a key issue in stock sustainability that is currently poorly understood and tends to be ignored in standard fisheries models; in this sense, the proposed research will give us the tools needed to study how predators interact with the early life history stages of commercially important species. Apart from this, the proposed field studies will also provide new estimates of predator abundance, distribution and spatial and temporal overlap with sardine early life stages on spawning grounds of the Bay of Biscay; field studies may also identify important predators and behaviours which have been previously overlooked. In this sense, changes in the abundance and distribution of predators, possibly linked to processes of climate change, have the potential to exert increased mortality on the early life history stages of commercial fish species and thus can damage stock viability or inhibit stock recovery. As well as being of scientific interest, the results will support the provision of policy advice on recovery plans and long-term sustainability of stocks under fish Tasks and responsibilities that the candidate will conduct as part of the research team: Task-1) To develop a DNA based species specific probe (Taqman probe) for detecting the presence of sardine in the stomachs of predators on sardine spawning grounds (partially done). Task-2) To quantify the distribution and abundance of different potential invertebrate predators on sardine early life stages in its Bay of Biscay spawning grounds during the spawning season ; to sample potential predators and preserve the stomach for future molecular investigation (potential predators already sampled, BIOMAN 2012) Task-3) To identify predators and quantify predation on sardine early life stages (applying the tool developed in Task 1).				
Analysis of sea level tidal components and residuals over the Southern Bay of Biscay by means of the Hilbert-Huang Transform	Sea level data with a 10' sampling frequency at Gijón, Santander and Bilbao for at least 5 years will be analyzed. The results of the application of the Hilbert-Huang transform to the identification of tidal components will be compared with standard harmonic analysis techniques using singular value decomposition. The residual sea level height data after removing the tidal components and the low-frequency variability (seasonal cycle) will be analyzed in order to remove the inverse barometric effect and with the final aim to identify the atmospheric forcing of Kelvin waves traveling through the coast.	Jon Sáenz jon.saenz@ehu.es Almudena Fontán AZTI	Applied Physics Dept. UPV/EHU, Leioa/ AZTI		Knowledge of computer programming using the R language.
Effects, accumulation and transfer of silver nanoparticles from invertebrates to fish	Manufactured nanoparticles (NPs) are considered as emergent contaminants and increasing concentrations are expected in the aquatic environments. As NPs display new physico-chemical properties, their toxic potential must be evaluated. Among metal NPs, Ag NPs have gained increased interest since they are already present in many consumer products due to their antimicrobial properties. The objectives of the project are: (1) to test the toxicity and accumulation of silver NPs to a zooplankton species (Artemia salina), and (2) to study the transfer through the food web to zebrafish.	Amaia Orbea, amaia.orbea@ehu.es	Cell Biology in Environmental Toxicology (CBET) Res Grp. UPV/EHU, Leioa	Spanish MINECO Ministry-funded NanoSilverOmics project	Preferable Degree in Biosciences (but not compulsory)
Cellular uptake and trafficking of metal containing nanoparticles in cells	This master thesis project is part of ongoing research projects on the fate and impact of metal containing nanoparticles (NPs) on aquatic organisms. The aim is to decipher mechanisms of NP uptake and internalization in cells of aquatic organisms, especially of mussels, bivalve molluscs used worldwide as sentinels of pollution and suitable model organisms to study NP toxicity. For this, experiments of exposure to Ag NPs will be carried	Miren P. Cajaraville mirenp.cajaraville@ehu.es	Cell Biology in Environmental Toxicology	Nanosilveromics res. Proj. consolidated res gr CBET, UFI	good background and interest in Cell Biology

of aquatic organisms by TEM	out in vivo. Then, cellular uptake and trafficking will be studied using transmission electron microscopy (TEM) and other imaging techniques. The work is part of the Nanosilveromics project funded by the Spanish Ministry. In addition, similar studies will be performed with samples already prepared from previous in vitro experiments of exposure to CuO, Ag and CdS NPs (EU funded Nanoretox project).		(CBET) Res Grp. UPV/EHU, Leioa/PIE	Ecosystem Health Protection	
Sequencing of vitellogenin gene in mussel *Mytilus galloprovincialis* and seasonal variations in transcription levels.	In vertebrates, vitellogenin (Vtg) is the egg yolk protein synthesized in females under estrogen regulation. Some emerging environmental pollutants called endocrine disruptors mimic estrogenic hormones and cause feminization of aquatic organisms, giving rise to induction of Vtg expression in juvenile and male organisms. In recent years, Vtg-like proteins have been measured in mussels using an indirect method, as a potential biomarker of exposure to endocrine disruptors. Further, a partial sequence of Vtg mRNA was recently sequenced in our laboratory. The aim of this master thesis project is to sequence the whole gene of Vtg using gene walking and to develop specific molecular tools in order to characterize the seasonal variations in transcription levels of Vtg along an annual reproductive cycle. Obtaining the whole DNA sequence of the Vtg gene will allow us to identify its regulatory regions and to understand the basis of regulation of transcription of this important gene. The work will be developed in the framework of a wider research line on the presence and impact of endocrine disruptors in estuaries of the Basque Country.	Miren P. Cajaraville mirenp.cajaraville@ehu.es Maren Ortiz-Zarragoitia maren.ortiz@ehu.es	Cell Biology in Environmental Toxicology (CBET) Research Group, UPV/EHU, Leioa and Plentzia	consolidated res gr CBET, UFI Ecosystem Health Protection n	good background and interest in Cell and Molecular Biology
A seasonal study of cancer and other histopathological alterations in cockles *Cerastoderma edule* from the Urdaibai Biosphere Reserve.	Our research group has developed a research line on the mechanisms of carcinogenesis in aquatic organisms, especially devoted to explore potential linkages between cancer development and environmental contamination. In this context we recently discovered that cockles inhabiting the Urdaibai Biosphere Reserve are affected by hemic or disseminated neoplasia. The ethiology of disseminated neoplasia in bivalve molluscs is not known but has been generally associated to a possible viral infection, although environmental contamination could also contribute. The aim of this master thesis is to study the prevalence of disseminated neoplasia along the reproductive cycle of cockles, based on the screening of hemolymph samples and on the histopathological analysis of digestive gland and gonad tissues in different cockle populations of the Urdaibai Biosphere Reserve. Furthermore, tissue samples will be submitted to chemical analysis to measure levels of bioavailable priority and emerging contaminants. Some samples will be analyzed by TEM in order to search for possible viral infections.	Miren P. Cajaraville mirenp.cajaraville@ehu.es	Cell Biology in Environmental Toxicology (CBET) Res Grp. UPV/EHU, Leioa/PIE	consolidated research group CBET, unit of formation and research Ecosystem Health Protection	good background and interest in Cell Biology
Reservoirs for parasitic protists in littoral environments	A major constraint for the control of important pathogens of commercial invertebrate species is the lack of life cycle information, particularly intermediate hosts and vector species. This study aims to detect and characterise parasitic infections in potential intermediate hosts (molluscs and crustaceans) inhabiting littoral environments. Particular emphasis will be given to identification of infections with haplosporidian, microcell (Bonamia, Mikrocytos), microsporidian, myxosporidian and ascetosporean (e.g. Paramarteilia) parasites. Samples will be taken for histopathological screening for assessment of the extent and severity of infections. This will involve familiarisation of the histological appearance of each host species and detection of pathological changes. Concomitant sampling to allow for parasite ultrastructure and molecular identification will be undertaken. The study will produce novel information on the health status of selected marine invertebrates, the life cycle of known pathogens in new hosts and potentially identification of new parasite species. The anticipated outputs of this project will include pathology atlases for invertebrate hosts and the specific taxonomic description of novel pathogen taxa from shoreline habitats.	S. W. Feist stephen.feist@cefas.co.uk G. D. Stentiford	Centre for Environment, Fisheries and Aquaculture Science, Weymouth Laboratory, Weymouth, UK.		MER

Mercury concentration in feathers of the Little Egret (*Egretta garzetta*) from several sites	Ardeids are a valuable component of the avian communities in wetlands, some of them affected by heavy metal pollution, from mining or industrial sources. The concentration of metals that organisms may accumulate is variable depending on the degree of environmental contamination and regarding different exposure routes (e.g. food, drinking water), therefore, bioaccumulation tends to be both site- and organism- specific. Ardeids are a relevant component of the avian community in wetlands, some being affected by heavy metal pollution due to industrial or mining activities. Little Egret are very useful indicator species since the feed closet o the nesting area, during the breeding season (Pietrelli & Biondi 2009), thus tissue metal levels reflect the bioaccumulation risk of the local pollutions of crayfish and fish species consumed by the adults. This project aims to explore the Hg tissue residues in the Little Egret Egretta garzetta to assess the potential for biological effects at population level (survival, growth and reproduction). Hg tissue concentration will be measured in Little Egret young individuals in nesting colonies of Izaro Island, in the Biosphere Reserve of Urdaibai (Biscay), the Natural Park of Marismas de Santoña, Victoria y Joyel (Cantabria), and the Natural Park of Marismas de Odiel (Huelva). Mercury levels in these colonies will be compared. In the first colony, young survival and reproduction will be also studied as a basis to assess threshold criteria for mercury that would protect the Little Egret populations. The use of non-invasive methods to measure the levels of contaminants in feathers is a requisite in studies dealing with protected species, but it also allows for monitoring the breeding populations in areas of interest along the years.	Maite Martinez maite.martinez@ehu.es Pilar Rodriguez Pilar.rodriguez@ehu.es	Ecotox lab. Leioa. UPVEHU		
Development of alternative methods for genotoxicity biomarkers in mussels	Micronucleus (MN) test has been widely used in order to determine genotoxic effects of pollutants in molluscs. As alternative to the MN test and aimed at facilitating processing in the field (and on board in case of offshore caging or fish samples) 8-oxo-dG immunohistochemistry will be applied for genotoxicity assessment in mussel hemocytes. Baseline studies will be performed in order to determine variations in the genotoxicity at different natural situations such as, for instance: tide-mark level (low, medium, high) in localities with different levels of pollution (Arriluze, Mundaka); the effect of the age (0.5-1.5; 1.5-2.5; 2.5–3.5; 3.5–4.5; 4.5–5; >5 cm shell length).	Beñat Zaldibar benat.zaldibar@ehu.es	Cell Biol in Environ Toxicol (CBET) Dept. Zool and Cell Biol, UPV/EHU, Leioa	Lab costs: BMW	
Histopathological alterations and metal distribution in oysters from the Bay of Biscay.	Oysters have been widely used as sentinel organisms in environmental monitoring programmes. In the Environmental monitoring carried out in France high Ag concentrations have been measured in oysters from the estuary of the Gironde. Presently samples of oysters from the Gironde estuary and two estuaries in the Basque Country coast (Abra, polluted, and Urdaibai, clean)will be collected at different seasons of the year, and chemical measurements of heavy metal pollution and histopathological alterations measurements will be performed.On the other hand, samples for Transmission Electron Microscopy will also be collected in order to see alterations at subcellular level and X-ray microanalysiswill be performed to see metal distribution within the different cell type	Beñat Zaldibar benat.zaldibar@ehu.es	Cell Biol in Environ Toxicol (CBET) Dept. Zool and Cell Biol, UPV/EHU, Leioa		
Development of alternative methods for genotoxicity biomarkers in mussels	Micronucleous (MN) test has been widely used in order to determine genotoxic effects of pollutants in molluscs. As alternative to the MN test and aimed at facilitating processing in the field (and on board in case of offshore caging or fish samples) 8-oxo-dG immunohistochemistry will be applied for genotoxicity assessment in mussel hemocytes. Baseline studies will be performed in order to determine variations in the genotoxicity at different natural situations such as, for instance: tide-mark level (low, medium, high) in localities with different levels of pollution (Arriluze, Mundaka); the effect of the age (0.5-1.5; 1.5-2.5; 2.5–3.5; 3.5–4.5; 4.5–5; >5 cm shell length).	Beñat Zaldibar benat.zaldibar@ehu.es	Cell Biol in Environ Toxicol (CBET) Dept. Zool and Cell Biol, UPV/EHU, Leioa	Lab costs: BMW	

Effects of acidification on mussel gamete viability.	The present work aims to study the effects of acidification on mussel gamete development and viability. It is known that acid environments can disrupt fertilization and embryo development in shellfish such as sea urchins. Mussels, used worldwide as sentinel organisms of marine ecosystem health, offer a good opportunity to study acidification processes, as recently found to be sensitive to high pC02. Transcriptome level changes have been reported in mussels subjected to acidic environment and poor adhesion strength to substrates. Together with assessing gamete development and quality, core health status biomarkers will be studied to evaluate adult stress after exposure to acidic environment. This work offers the opportunity on learning on fertility and fecundity techniques together with introducing the student on the evaluation of changes in the environment to marine organisms	Urtzi Izagirre urtzi.izagirre@ehu.es Maren Ortiz-Zarragoitia maren.ortiz@ehu.es	Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	BMW res proj, cons research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology and animal physiology
What stresses Manila clams (bivalve) in Arcachon Bay?	Manila clam (*Ruditapes philippinarum*) is the 2nd exploited bivalve in the world. In Arcachon bay, it also ranks in second position after oysters. In years 2009-2011, a national project aimed to understand why was the stock declining and why individuals displayed poor fitness. Many parameters were analysed (condition index, parasites, metals, …) and related to environmental parameters. The objective (2/3 of the topic) is to perform an exhaustive bibliographical work to extract all data about this bivalve that could explain what perturb clams. Concomitantly, the student will complete the data base by performing a new sampling campaign and will provide missing data concerning parasites (1/3).	Xavier de Montaudouin	University Bordeaux 1 – Marine Station at Arcachon, France	Local funding (Adera)	perfect English reading skill. Multivariate data analysis. Good background and interest in marine biology.
Physiological energetics of fast and slow growing spats of the mussel *Mytilus galloprovincialis* cultured under laboratory conditions.	Growth rate has been shown to vary greatly between individuals in natural bivalve populations. Differences in the growth rate between specimens that are exposed to similar environmental conditions indicate the existence of inter-individual differences in the capacity to retain energy. Such variability provides a scope for improvement of bivalve production through the implementation of selection. Thus, understanding the energetics underlying inter-individual growth variability is an important task in aquaculture. Given the "balanced energy equation" P = I – (F + U) - R , where the difference between energy ingestion (I) and loss in the faeces (F) can also be termed as absorption (A), inter-individual differences in production (P) might a priori rely in the different physiological processes underlying each term in the equation. The relatively small energetic losses derived from excretion (U) have been reported to be negligible in many occasions (A) and metabolic rate (R). On the other hand, metabolism comprises two different components: the costs of the physiological processes in charge of structural maintenance of the individual (basal metabolic rate: Rb) and, the cost of the processes sustaining tissue growth (costs of growth: Rg) which is indeed influenced by growth itself. The energetic basis of inter-individual differences in growth rate has been analyzed in several bivalve species. Often contradictory conclusions emerging from these studies suggest that differential growth potential obeys to multiple determinants. To analyze the physiological basis of differential growth, spats of *Mytilus galloprovincialis* from a natural population will be transported to the laboratory and allowed to size differentiate after prolonged maintenance of mussels under good feeding conditions in the laboratory. Once size-differentiation occurred, individuals showing the lowest and the highest growing rates will be selected and utilized for the following analysis: Physiological components of the energy balance in feeding experiments. Digestive enzyme activities in the digestive organs. Morphometric measurements of feeding and digestive organs.	Irrintzi Ibarrola irrintzi.ibarrola@ehu.es Enrique Navarro enrique.navarro@ehu.es	Animal Physiology. Dep Genetics, Physical Anthropology and Animal Physiology. Faculty of Science and Technology. UPV/EHU	Funded with the existing research resources of the research team	

Effect of nonylphenol in the clam *Ruditapes decussates* using a proteomic approach	A proteomic approach using 2D electrophoreses will be used to assess the effects of exposure of low concentrations of nonylphenol in the clam Ruditapes decussatus.	Maria João Bebianno mbebian@ualg.pt	CIMA, University of Algarve, Faro, Portugal		good background and interest in Biology, Biochemistry, > Chemistry, Molecular biology
Effects of a mixture of priority substances in a bivalve population	To assess the effects of exposure to a mixture of priority substances mussels will be exposed to a mixture of priority substances (emergent and with more traditional compounds), biomarkers of exposure and effect will be measured in the different tissues (gills and digestive gland) at different times of exposure	Maria João Bebianno mbebian@ualg.pt	CIMA, University of Algarve, Faro, Portugal		good background and interest in Biology, Biochemistry, > Chemistry, Molecular biology
Biomarker levels in deep sea fish from hydrothermal vents	Biomarkers from different tissues of deep-sea fish collected from hydrothermal vents a well as metal levels will be analysed in order to compare these levels in these species from different hydrothermal sites.	Maria João Bebianno mbebian@ualg.pt	CIMA, University of Algarve, Faro, Portugal		good background and interest in Biology, Biochemistry, > Chemistry, Molecular biology
Adaptation of mussels to extreme anthropized environments in the Basque coast		Manu Soto manu.soto@ehu.es Ionan Marigómez ionan.marigomez@ehu.es	Cell Biol in Environ Toxicol (CBET) Dept. Zool and Cell Biol, UPV/EHU, PIE-Plentzia	cons research group CBET, unit of formation and research Ecosystem Health Protection	
Investigating nitrogen and phosphorus geochemistry in seagrass meadows over diurnal and seasonal cycles	Coastal sediments are zones of intense biological activity, particularly complex habitats such as seagrass meadows, which contribute to 12% of the global organic carbon production in the oceans. Recent studies have demonstrated that seagrass habitats experience dramatic changes in biogeochemistry between day and night – seagrass pump the oxygen produced by photosynthesis into the sediment to minimise their exposure to reduced phyotoxins (sulphide and ammonium). Recently developed two-dimensional in situ techniques have	Dr Dave Welsh, Assoc. Prof. Peter Teasdale, Will Bennett	Environmental Futures Centre Griffith University Gold Coast, Queensland Australia		Skills in microbiology, chemistry and field work.

Improving our understanding of sediment biogeochemistry and heterogeneity by using new in situ, two-dimensional measurement techniques	Sediments are complex systems that play an important role in the cycling of metals, nutrients, and carbon. The biogeochemistry of sediments is driven by the decomposition of deposited organic matter by successive layers of microbial respiration. Bacteria obtain energy for respiration from oxidised substances, such as O2. However, when the O2 is depleted other substances are utilised in turn; NO3-, Mn(IV)O2(s), Fe(III)OOH(s) and SO4-2. Reduced forms of the above species, soluble Fe(II), Mn(II) and sulphide, are products of this respiration and therefore provide a guide to the main biogeochemical processes and zones within sediment (Fe(II) and Mn(II) are indicative of the sub-oxic zone and sulfide of the anoxic zone in marine sediment). Burrowing organisms and benthic plants dramatically modify these biogeochemical zones, introducing considerable heterogeneity (often on a mm-scale) into the distribution of these substances in sediment porewaters (see Figure). Conventional methods of measuring solutes in sediment porewaters are not capable of measuring distributions in two-dimensions at all or of making measurements at sufficient resolution to allow the heterogeneity of these biogeochemical zones to be observed accurately. This can lead to misinterpretation of the biogeochemical interactions. This project will use colourimetric DET (Fe(II), Mn(II), phosphate) and DGT (sulfide, phosphate) methods currently available to investigate the biogeochemistry and heterogeneity of several coastal sediment habitats (e.g. mangrove, seagrass and non-vegetated coastal sediment) which will provide a range of conditions with respect to sediment particle size, organic matter and density of benthic macro-organisms	Assoc. Prof Peter Teasdale, Dr Dave Welsh, Dr Jared Panther	Environmental Futures Centre Griffith University Gold Coast, Queensland Australia		Skills in microbiology, chemistry and field work.
Bioaccumulation of metals in juveniles of the oyster Crassostrea gigas in the North Médoc region (Gironde estuary, France)	The trainee will be in charge of analyzing the metals bioaccumulated in the tissues of juvenile oysters originating from a fish farm and transplanted during one year in the salt marshes of the North Médoc region. The transplantation experiment started in April 2013 and will end in April 2014. Sampling is realized in situ every 40 days. The student will participate to the collect of oysters in the field and will be in charge of the preparation and analysis of metals by ICP-OES in the Lab. Around 12 elements will be analyzed on 5 replicates of samples originating from 2 sites. An important part of the work will be dedicated to the statistical treatment of the produced data and their comparison with an identical study conducted 10 years before on the same sites. The final aim is to characterize for instance the capacity of Cd bioaccumulation by juvenile oysters in the salt marshes of the North Médoc region, according to the progressive decrease of the concentrations of this metal in the Gironde estuary from several decades.	M. Baudrimont and A. Legeay	January 2014 to June 2014	436.05 € monthly net salary.	Audrey Chelini
The Effects of Climate Change and Climate Variability on Life in the Ocean	Climate change ecology (and biology in general) traditionally uses species as the fundamental unit of analysis: the trait-based approach, however, is a new paradigm that instead considers organisms in terms of their traits. Can we use this approach to understand the vulernability of species to climate change? Can we use it to project the impacts in the future?	Mark Payne (Denmark)	January 2014 to June 2014		