N°2 November 2013

Newsletter

www.perene-project.eu

PeReNE
Peptide Research Network of Excellence

PeReNE Second Steering Committee

The second steering committee of the PeReNE project took place on October 23rd, 2013, in Rouen. This meeting was the opportunity to assess the progress of our activities since the beginning of the project and to discuss actions to be taken in the coming months. As part of the discussions, the emphasis was put on the importance of strengthening people exchanges between partners and to implement actions promoting the various aspects of our research on peptides towards the lay public, on the different sites of the project. This day was also an opportunity to organize meetings between the researcher teams, for an update, one year after approval of the project, of the progress of the collaborative research projects. The next steering committee will be held in Portsmouth in March 2014.

PeReNE at ConneXion R&D

Dr **David VAUDRY** (INSERM U982) will give a conference entitled « PeReNE, a research cluster on peptides, an opportunity for the cosmetic industry » during the Connexions R&D event that will take place on December 10th, 2013, in Orléans. For further information and to register to the meeting, see: http://www.connexions-rd.com

Cosmetic Valley France

IFSCC meeting

The SFC (French Cosmetology Society) is hosting the 28th IFSCC Congress, which will take place in Paris (Palais des Congrès) from October 27th to 30th, 2014 (International Federation of Societies of Cosmetic Chemists: http://www.ifscc2014.com). The deadline for submitting abstracts for this international congress is set on December 20th, 2013 (http://www.ifscc2014.com/en/abstract-submission). For further information, contact Laura Gilbert at lgilbert@cosmetic-valley.com.

ifscc
Cosmetic innovation and performance for beauty and well-being

Thesis

Ms **Isabelle LEQUEUX** (UMR CNRS 6270) will defend her PhD thesis entitled *« Development of antibacterial biopolymers by grafting an antimicrobial peptide: the example of nisin »*, on November 8th, 2013. (Supervisor: Dr. **Thierry JOUENNE**).

PBS
Polymères Biopolymères Surfaces
UMR 6270

Recruitments

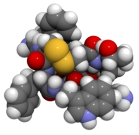
Mr **Paul GIULIANI** was recruited at INSERM Unit 982 as project officer, in charge of the administrative and financial management of the PeReNE project. Mr **GIULIANI**'s tasks include monitoring the performance of the project in terms of financial realization and activities. Under the supervision of Dr **David VAUDRY**, he will also develop the cross-border partnership of the PeReNE network and set up communication activities.

DC2N

Ms **Milène TETSI** was recruited as an engineer at INSERM U982, in the context of the PeReNE project. Under the direction of Dr. **David VAUDRY,** Ms TETSI will develop transcriptomic projects (Quantitative PCR and Digital PCR) in collaboration with other teams of the PeReNE project.

Dr **Maryline BOSSUS** joined Pr **Alex FORD**'s team at the University of Portsmouth, as a postdoctoral researcher, on a project called *« neuroendocrine disruption in crustaceans »*, part of the action: *« central peptidergic control and peripheral cardio-respiratory functions and effects of endocrine disruptors ».* This project will investigate the effects of selective serotonin reuptake inhibitors (SSRIs) on behavior and peptide gene expression in amphipod crustaceans.

University of Portsmouth



Developing biomarkers for behavioural and transcriptomic changes in the amphipod Echinogammarus marinus exposed to antidepressants

*Dr **Maryline BOSSUS** and Dr **Alex FORD***

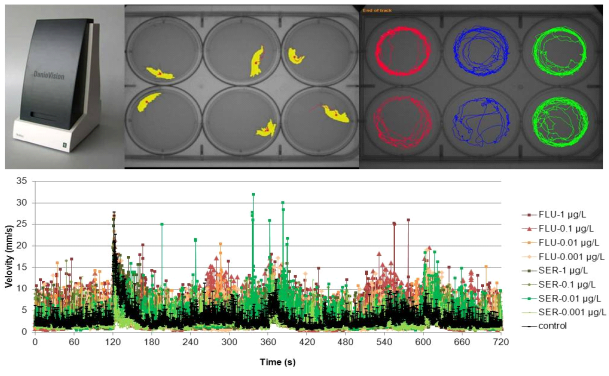
University of Porstmouth

Within PeReNE we are working on the work-package entitled "*Central and peripheral peptidergic control of cardiovascular and ventilator activities and effects of endocrine disruptors*". In the past decade, there have been increasing concerns regarding the effects of pharmaceutical compounds in the aquatic environment. However, very little is known about the effects of antidepressants, such as the Selective Serotonin Re-uptake Inhibitors (SSRIs), the Serotonin-Norepinephrine Re-uptake Inhibitors (SNRIs) and Serotonin Antagonist and Re-uptake Inhibitors (SARIs).

This ongoing study is currently developing behavioural and gene expression markers of exposure and effects of neurological endocrine disruption in Crustacea. Within the invertebrates, many biological functions including reproduction, moulting and behaviour can be under serotonin control. Several neuropeptides have the potential to be impacted by antidepressants and might induce side-effects on the fitness of crustaceans.

The effects of serotonin and fluoxetine have recently been shown to alter the behaviour of the marine amphipod, *Echinogammarus marinus* (Leach, 1815) at environmentally realistic concentrations. Our investigation continues this research by tracking behaviour of amphipods exposed to a range of environmentally relevant concentrations of antidepressants such as Fluoxetine, Sertraline, Duloxetine and Trazodone. The behavioural analyses are done using state of the art behavioural hardware DANIOVISION and its software EthoVision XT. In addition, the recently sequenced transcriptome for *E. marinus* is being mined for neurological genes, the expression of neuropeptides genes such as the anxiolytics neuropeptide Y (NPY) and substance P (SP) and the expressions of genes involved in the serotonin metabolic pathway, such as serotonin receptors and transporters will be quantified in these animals using qPCR.

This project is expected to improve our understanding of the effect of antidepressants on aquatic invertebrates and to assess their potential as neuroendocrine disruptors.

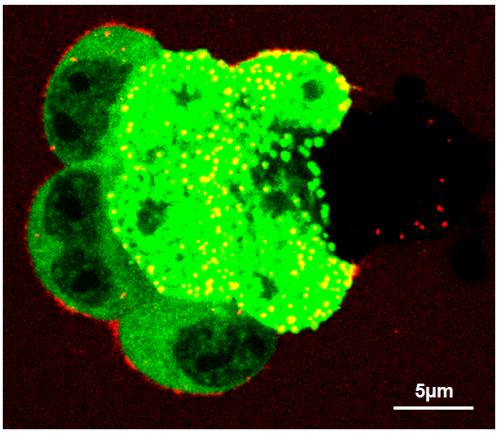


Role of neuropeptide-reactive immunoglobulins in the peptidergic signaling

*By Pr **Sergueï FETISSOV***

Inserm U1073, Rouen University, France

Chemical transmission mediated by peptides including peptide hormones and neuropeptides is quite different from the classical transmitters such as catecholamines, GABA or glutamate. Some distinguishing features include peptide extrasynaptic release, absence of reuptake and the nanomolar affinity for their receptors which belong to the G-protein coupled receptor family. High affinity receptor binding of peptides determines the specificity of peptide action on each receptor subtype which may depend on peptide length and posttranslational modifications. In fact, after release, peptides are quickly degraded by various enzymes present in plasma and extracellular space. These features of peptidergic signaling imply that biological action of peptides should depend on preservation of their intact structures. The cumulative evidence indicate that immunoglobulins (Ig) may play a role of natural carrier molecules for neuropeptides and, hence, may constrictively participate in peptidergic signaling. Indeed, neuropeptide-reactive IgG are ubiquitously present in humans and rodents without exogenous antigenic stimulation. Recent data show that plasma IgG protect peptide hormones from degradation by plasma enzymes, thereby, preserving peptide biological activities. Furthermore, slight differences in IgG affinities for peptide hormones but which remain in the micromolar range can change peptide carrier properties resulting in enhancement or in diminishment of peptide biological activities. Such differences in IgG affinities for peptides involved in the regulation of food intake may underlie altered appetite in patients with eating disorders and obesity. Thus, better understanding the origin and differences of neuropeptide -reactive IgG may help to develop new therapeutic approaches.



Human autoantibodies against α-MSH (red and yellow) surround and are internalized by cells (green) expressing melanocortin MC4 receptor (Confocal microscopy image by Nicolas Lucas, PhD student at Inserm U1073).

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