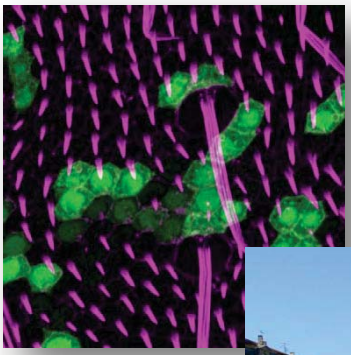
A balance between JNK and Hippo signalling pathways maintains the cellular homeostasis of the intestine upon bacterial food poisoning

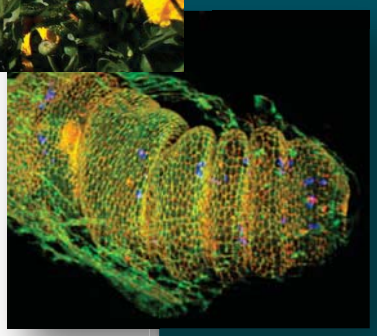
Armel Gallet, Rihab Loudhaief, Alexandra Brun-Barale, Olivia Benguettat, Marie-Paule Esposito, Marcel Amichot

28th Annual French Drosophila Conference



Invited speakers:

Clemens Cabernard
Marc Dionne
Bénédicte Durand
Alex Gould
Yacine Graba
Mounia Lagha
Stéphane Noselli
Pauline Speder



Sète 2014

Relais Cap France LE LAZARET

27-30 Octobre

Sponsors

Organizing committee: Michèle CROZATIER, Jean-Louis FRENDO, Guillaume ISABEL, Serge PLAZA, Magali SUZANNE and Xiaobo WANG

Abstract plenary sessions

28th Annual French Drosophila Conference

Sète - France
27-30 octobre 2014

A balance between JNK and Hippo signalling pathways maintains the cellular homeostasis of the intestine upon bacterial food poisoning

Gallet Armel [1*], Loudhaief Rihab, Brun-Barale Alexandra, Benguettat Olivia, Esposito Marie-Paule, Amichot Marcel

1 : Institut Sophia Agrobiotech (ISA)
UMR
UMR INRA 1355/CNRS 7254/UNS 400 route des Chappes, BP 167 06903 Sophia Antipolis Cedex - France
* : Corresponding author

The digestive tract is continuously subjected to multiple aggressions by virus, bacteria, toxins and chemicals present in the food. Therefore the gut lining has established a mechanism of replenishment in order to maintain the physiological function of the organ called "the gut homeostasis". Upon aggression, a complex network of signaling pathways is taking place between the different cell types, allowing the proliferation of the Intestinal Stem Cells and then the appropriate differentiation of ISCs daughter cells in order to replace the defective epithelial cells.
Among the aggressors hidden in the food, there is the bacterium Bacillus thuringiensis (Bt) that is widely used worldwide as bioinsecticides. Indeed, Bt bioinsecticides are increasingly used instead of chemical pesticides since the few years. These bioinsecticides are mainly used in organic farming and in forestry to fight against pest lepidopterans and there are also used for mosquito control either for the well being of the population or to fight vectors of human diseases such as yellow fever, chikungunya, and malaria. Consequently, the Bt bacterium is more is more present in the feed and environment.
Although the specificity of the acute toxicity of the Bt bioinsecticides has been proved since many years, with no acute toxicity observed towards non-target species ranging from bees to human, data are scarce on adverse effects that could result from chronic exposure. The question today is how far non-target organisms will be impacted by the augmentation of the use of Bt bioinsecticides?
To answer this challenge, we are using drosophila (a non-target organism) to study the impacts of Bt bioinsecticides on the gut physiology. I will present how the intestine quickly mounts physiological defences against Bt bacteria and is able to overcome a Bt food poisoning. I will also present the consequences of a prolonged exposition to Bt bioinsecticides.