

Seminar in Microbiology

Monday, 16th January, 2017

Salle de séminaire, E07.3347.a, CMU

11:30 – 12:30

Prof. Bruno Lemaitre

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The foreign within: *Drosophila-Spiroplasma* interaction as a model of insect endosymbiosis.

The Lemaitre lab focuses on understanding mechanisms of microbial infection and corresponding host defence responses in *Drosophila* using genetic and genomic approaches, examining specifically bacterial endosymbionts. Virtually every species of insects harbors facultative bacterial endosymbionts (ex. *Wolbachia*) that are transmitted from females to their offsprings. These symbionts play crucial roles in the biology of their hosts. Some manipulate host reproduction, for example, by killing the sons of infected females, in order to spread within host populations. Other symbionts protect their hosts against natural pathogens and parasites. As very little is known about the molecular mechanisms underlying most endosymbiont-insect interactions, the Lemaitre lab explores the interaction between *Drosophila* and its endosymbiont *Spiroplasma poulsonii* using a broad range of approaches ranging from molecular genetics to genomics. The fundamental knowledge from studying the *Drosophila-Spiroplasma* interaction serves as a paradigm for other endosymbiont-insect interactions that are less amenable to genetic studies.

Selected recent publications:

- Herren, J. and Lemaitre B. (2011) Spiroplasma and host immunity: Activation of humoral immune responses increases endosymbiont load and susceptibility to certain bacterial pathogens in *Drosophila melanogaster*. *Cell. Microbiology* 13(9):1385-96
- Herren JK, Paredes JC, Schupfer F, and Lemaitre B. 2013. Vertical transmission of a *Drosophila* endosymbiont via cooption of the yolk transport and internalization machinery. *MBio* 4 Mar 5;4(2). pii: e00532-12.
- Herren JK, Paredes JC, Schüpfer F, Arafah K, Bulet P, Lemaitre B. Insect endosymbiont proliferation is limited by lipid availability. *eLife*. 2014 Jul 15;3:e02964.
- Paredes JC, Herren JK, Schüpfer F, Marin R, Claverol S, Kuo CH, Lemaitre* B, Béven* L (2015) Genome Sequence of the *Drosophila melanogaster* Male-Killing Spiroplasma Strain MSRO Endosymbiont. *MBio*. 31;6(2). pii: e02437-14. doi: 10.1128/mBio.02437-14.
- Ramond E, Maclachlan C, Clerc-Rosset S, Knott GW, Lemaitre B. (2016) Cell Division by Longitudinal Scission in the Insect Endosymbiont *Spiroplasma poulsonii*. *MBio*. Jul 26;7(4). pii: e00881-16.
- Paredes JC, Herren JK, Schüpfer F, Lemaitre B. (2016) The Role of Lipid Competition for Endosymbiont-Mediated Protection against Parasitoid Wasps in *Drosophila*. *MBio*. 2016 Jul 12;7(4). pii: e01006-16.
- Harumoto T, Anbutsu H, Lemaitre B, Fukatsu T. (2016) Male-killing symbiont damages host's dosage-compensated sex chromosome to induce embryonic apoptosis. *Nat Commun*. 7:12781