

Seminar in Microbiology

Monday, March 16, 2015

Salle de séminaire 7172, CMU

11:30 – 12:30

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Integration of prophage genes into the host regulatory network

Bacteriophages are the most abundant biological entities in the biosphere. Among them, temperate phages are able to integrate their genome into the host and replicate passively through a lysogenic state. Hosts frequently benefit from such a massive gene acquisition through lysogenic conversion. As prophages may be beneficial to their hosts, we hypothesize that hosts adapted strategies to maintain that gene source.

Our results show that lysogeny maintenance of a class of prophages, which all share a same unusual genetic organization, are controlled by the transcription termination factor Rho. Rho is not only involved in horizontally acquired gene silencing but also in prophage maintenance, which can be seen as an adaptation of the host to maintain prophage genes. For these prophages, whether defective or functional, their induction by the inactivation of Rho, involves a new pathway of lysogeny escape, which is independent of the classical the SOS response pathway. Other master regulators, in various Enterobacteria species, are under study to understand how prophage genes are integrated into the host regulatory network.

These newly characterized interactions reflect the co-evolution of host and viruses, allowing the acquisition of genes, and thus new properties, via horizontal transfer, while controlling the expression of deleterious genes.