Université de Montréal

MICROBIOLOGIE, INFECTIOLOGIE ET IMMUNOLOGIE

CONFERENCE

April 23 at 11.30AM
Room N-833
Université de Montréal, Pavillon Roger-Gaudry.
2900 boul. Édouard Montpetit (Chemin de la tour), Montréal.

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An extrachromosomal phage satellite reveals hybrid mobility strategies in Vibrio

Phage satellites are mobile genetic elements that exploit bacteriophages through a parasitic relationship. Typically integrated in bacterial chromosomes, they are activated by helper phages whose assembly machinery they hijack to ensure their own dissemination to new hosts. Some satellites can also inhibit phage propagation, posing challenges for the use of phage therapy as an alternative to antibiotics.

From a large collection of marine Vibrios, we identified a new phage satellite, named cf-PISP (capsid-forming Phage-Induced Satellite Plasmid). This 15.8 kb extrachromosomal element encodes plasmid-associated functions (repA, parA and a FinO/ProQ-like post-transcriptional regulator) but lacks an integrase. It also carries structural and packaging genes typical of capsid-forming satellites (capsid, portal, protease) yet does not encode phage tail proteins. A co-occurring prophage encodes integration, excision, assembly and lysis functions but lacks a capsid gene, suggesting it may act as a helper phage for the plasmid-satellite.

We hypothesize that cf-PISP is a hybrid mobile element that spreads via transduction by hijacking helper phage tail proteins and possibly via conjugation by exploiting the machinery of co-occurring conjugative plasmids. Altogether, cf-PISP provides a new model to study hybrid mobility strategies in mobile genetic elements and phage-satellite interactions.