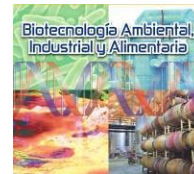

Talk



Analysis of the association between bacteriophages and related strains *Pseudomonas aeruginosa* bacteria

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ABSTRACT

Motivation: Bacteriophages can stay as prophages inside host genome when bacteria are infected by them. Bacteria use numerous defense systems against them, some of them were known years ago. CRISPR-Cas systems are an acquired immunity systems in bacteria that recognize and degrade phages specifically through the spacers. Using numerous genomes of different strains from *Pseudomonas aeruginosa*, a ESKAPE group bacteria, prophages can be associated with certain strains by some of their features, as the isolation source, the geographic location or the CRISPR-Cas systems which they have, in order to know the which features must have a bacteria to be infected by a particular bacteriophage.

Methods: It was used some bioinformatic tools to predict multiple prophages in *P. aeruginosa* genomes and a few scripts written in some programming languages such as Python or Bash. In order to analyze the relationship between strains features and prophages, it was built some graphical plots by using RStudio, such as heatmaps and barplots. Also, it was performed some statistical tests to determinate the significancy of the results.

Results: Some of most present phages in *P. aeruginosa* are correlated with specific strains and some of their feature, specially the CRISPR-Cas systems, as the CRISPR type E or strains without CRISPR-Cas systems. In addition, some of these phages are present in strains with only one particular CRISPR-Cas system or isolated from only a certain source. Finally, phages were associated to the presence of particular transmembrane protein, to discover what protein use the phages to infect host cells.

Conclusions: The results suggest that bacteria have a set of certain genes, such as transmembrane proteins that allow the adhesion and infection of particular phages in the host cell, so bacteria have to obtain specific CRISPR-Cas systems against these bacteriophages to recognize and degrade them, in order to avoid the infection.

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