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Phages of Brazil-Prospection of bacteriophages against Pseudomonas Aeruginosa and Klebsiella pneumonia with potential for application in Phage therapy

Layla Farage Martins
Sao Paulo University, Brazil

As a consequence of antibiotic overuse and misuse, bacteria develop multiple antibiotic resistance mechanisms, causing difficult-to-treat infections (1; 2; 3). Among the leading group of superbugs (ESKAPE) are Pseudomonas aeruginosa (PA) and Klebsiella pneumoniae (KP), that can rapidly gain resistances to several classes of antibiotics and are able to cause a variety of nosocomial infections (4; 5). The search and development of new and effective antibacterial compounds is urgently required to avoid a threatening future. In this line, (bacterio)phages could be one option to address antimicrobial resistance. Phages are bacterial viruses and the most abundant entities on Earth (6). Our group is particularly intersted in the prospection and characterization of new phages from Brazil against PA and KP. Here we present the isolation and physical/biological/molecular characterization of novel lytic phages and its efficacy in the control of PA and KP. Using PA14 as host, we have isolated two different phages, named ZC01 and ZC03, from Sao Paulo Zoo Park composting samples (7). These phages code for more than 60% of the predicted ORFs on the genome and have a restricted and relatively different host range of PA clinical isolates (in preparation). The phage Kpn31, classified as a Sugarlandvirus based on its complete genome sequence, was isolated from hospital wastewater using KP CCCD-K001 as the host. Phage Kpn31, was shown to be effective against at least six multidrug resistant KP clinical isolates (8). These phages have potential for controlling infections caused by KP and PA14 relatedstrains.

Biography

Layla Farage Martins is PhD in Biochemistry, Molecular Biology Program, at the Chemistry Institute of Sao Paulo University (2010). She is the lab manager of a Genomic Facility (Center for Advanced Technologies in Genomics) and advisory of graduate and pos graduated students. Participates in research projects related to the study of composting microbiome dynamics and the discover of phages for Phage Therapy application. She has published 17 papers in indexed journals.