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Phage therapy: An alternative treatment option for bacterial infections caused by extensively-drug resistant pathogens

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Multi-drug resistant (MDR) pathogens are serious causative agents of various infectious diseases. The spectrum of resistance and the severity of infections are important considerations to select antimicrobial therapy while the treatment options for MDR pathogens are very limited. Bacteriophage (phage) therapy is considered as an alternative way to prevent and treat bacterial infections. For obvious reasons, MDR -as well as extensively-drug (XDR)- pathogens are a primary target for phage therapy. Phage therapy has been used in some Eastern European countries as part of their medical practice. On the other hand, the rest of the world -including Turkey- has only recently considered this therapy as an experimental option. Phage isolation/identification and host range characterization are the first steps for phage therapy practice. We examined the host range of certain phage cocktails that are commercially available in Georgia, on a panel of clinical MDR-strains. The phage cocktails' antibacterial efficiencies were found to be promising being effective on up to 90% of the strains, based on spot testing. We conducted phage isolation studies as well for a set of XDR-colistin resistant strains isolated from different clinical samples of hospitalised patients. We isolated three different phages classified based on their biological properties. According to whole genome sequencing analysis two of them belonged to *Myoviridae* family and one to *Siphoviridae* family. No virulent and antimicrobial resistance genes were found in their genomes. Our findings suggest that phage therapy is a promising alternative treatment option for difficult-to-treat infections caused by MDR/XDR bacterial strains.

Biography

Aycan Gundogdu completed her PhD at the University of the Sunshine Coast, Australia. Currently, she is an assistant professor of Microbiology and Clinical Microbiology in Erciyes University, Turkey. She serves as the principal investigator of Metagenomics Division in Genome and Stem Cell Center (GENKOK), Turkey. She has involved in variety of research projects in the field of bacterial genomics, metagenomics, and phage therapy/biology.

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