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Prevention and degradation of *Acinetobacter baumannii* biofilm formation by phage Φ AB6 and its tail fiber protein**Md Shahed-Al-Mahmud and Nien-Tsung Lin**
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Acinetobacter baumannii is a Gram-negative bacillus and undoubtedly one of the most successful pathogens responsible for nosocomial infections with clinical implications like urinary tract infection. Although *A. baumannii* biofilms are a growing concern in a broad range of areas, the biofilm degradation of multidrug-resistant *A. baumannii* is essential for new therapeutic treatment option of nosocomial infections in the hospital environment. A number of reports have demonstrated that it can form biofilms on several biotic and abiotic surfaces, providing the bacteria with protection against antibiotic treatment and the host immune defenses *in vivo*. During the last decades, the use of virulent bacteriophages has re-emerged for therapeutic purposes. The aim of this study was to assess the effectiveness of phage Φ AB6 and its Tail Fiber (TF) protein to prevent and degrade the biofilm of MDR *A. baumannii*. The TF gene was ligated with pET28a then transformed into *E. coli* for protein expression. In this study, eight Φ AB6 susceptible clinical isolates of *A. baumannii* examined for biofilm forming ability. The biofilm formation assay observed at different periods of time (24, 48 and 72 hours) on 96 well microtiter plates. The observation of some clinical isolates of *A. baumannii* produced more biofilm up to 72 hours. However, we only highlighted strain AB54149 biofilm forming ability using light microscopic observation up to 7 days. The biofilm degradation assay, we find out that the effective degradation ability by phage Φ AB6 was 65% whereas, TF protein degrades ability was 55%. In biofilm prevention assay, markedly prevent biofilm formation by phage Φ AB6 78% while TF protein prevents 62%. On the other hand, biofilm inhibition assay also endorsed the potential biofilms inhibition ability by phage Φ AB6 92% while its TF protein inhibits 61%. Scanning electron microscopy (SEM) also showed that the impact of phage Φ AB6 and its TF protein have the ability to change the morphology of AB54149 in silicon coated Foley catheter. These findings suggest that the treatment of phage and its tail fiber protein is a promising therapy to prevent and degrade *A. baumannii* biofilms.

Biography

Md Shahed-Al-Mahmud has his expertise in bacteriophagology. He is pursuing his Masters on prevention and degradation of *Acinetobacter baumannii* biofilm formation by phage Φ AB6 and its tail fiber protein in Microbiology and Immunology Department of School of Medicine at Tzu Chi University.

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