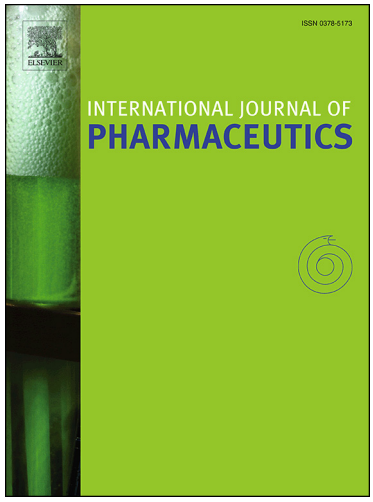


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# Synergy of nebulized phage PEV20 and ciprofloxacin combination against *Pseudomonas aeruginosa*

Yu Lin[1], Rachel Yoon Kyung Chang[1], Warwick J Britton[2], Sandra Morales[3], Elizabeth Kutter[4], Hak-Kim Chan[1]#

1. Advanced Drug Delivery Group, School of Pharmacy, Faculty of Medicine and Healthy, University of Sydney, Sydney, NSW, Australia
2. Tuberculosis Research Program, Centenary Institute and Faculty of Medicine and Healthy, University of Sydney, Sydney, NSW, Australia
3. AmpliPhi Biosciences AU, Brookvale, Sydney, NSW, Australia
4. The Evergreen State College, Olympia, Washington, USA

## Abstract

Nebulization is currently used for delivery of antibiotics for respiratory infections. Bacteriophages (or phages) are effective predators of pathogens including *Pseudomonas aeruginosa* commonly found in the lungs of patients with cystic fibrosis (CF). It is known that phages and antibiotics can potentially show synergistic antimicrobial effect on bacterial killing. In the present study, we investigated synergistic antimicrobial effect of phage PEV20 with five different antibiotics against three *P. aeruginosa* strains isolated from sputum of CF patients. The antibiotics included ciprofloxacin, tobramycin, colistin, aztreonam and amikacin, which are approved by U.S Food and Drug Administration (FDA) for inhaled administration. Phage and antibiotic synergy was determined by assessing bacterial killing performing time-kill studies. Among the different phage-antibiotic combinations, PEV20 and ciprofloxacin exhibited the most synergistic effect. Two phage-ciprofloxacin combinations, containing 1/4 and 1/2 of the minimum inhibitory concentration (MIC) of ciprofloxacin against *P. aeruginosa* strains