conferenceseries.com

46th World Congress on

MICROBIOLOGY

September 18-19, 2017 Dublin, Ireland

Bacterial stress-induced increase of phage production mediated by a delayed lysis

Yunyeol Jo, Jaeyeon Jang and Heejoon Myung Hankuk University of Foreign Studies, South Korea

When phages infect bacteria cultured in the presence of sub-lethal doses of antibiotics, sizes of phage plaques significantly increase. This phenomenon is known as phage-antibiotic synergy (PAS). PAS was observed in both gram-positive and gram-negative bacteria. We confirmed that cells stressed with β -lactam and quinolone antibiotics filamented or swelled extensively and increased phage productions were observed from them. Although cell surfaces enlarged as they filamented, phage adsorption efficiency did not change in the presence of antibiotics. A prolonged assembly period as well as increased phage DNA replication, transcription, and translation due to enlarged production facility were observed in these cells. Increase in cell surface area exceeded that of phage holin production in filamented host cells, leading to relatively limited availability of intracellular holins to aggregate and to form a hole in the host membrane. Reactive oxygen species (ROS) stress also led to increased production of phages, while heat stress showed only limited increase in phage production.



Figure 6. Changes in phage T4 production in the presence of other stresses. (A) Bacterial filamentation in the presence of the sub-lethal does of hydrogen peroxide (43 mM) or elevated temperature (46°C) was observed under a light microscope. (B) One step multiplication ourve of phage T4 in the presence of the two stresses.

Biography

Yunyeol Jo is a graduate student of Virology at Hankuk University of Foreign Studies in South Korea. Currently, he is working on the removal of biofilm using engineered phage displaying colanic acid degrading enzyme (CAE). He also participated in the research about increased phage production using antibiotics, ROS, and heat.

virusyy@hufs.ac.kr

Notes: