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Targeted delivery of phages induced anti-cancer effect in mice models

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Oncolytic animal viruses are well documented and proven to be effective against cancer. Their anticancer effect was generally based on two ways: one is their ability to infect and lyse host cells while the other is enhancement of host immune responses. Phages are viruses that can be engineered to display peptides targeting specific cancer cells. We wanted to see whether phages can act as oncolytic viruses. Hence, in this experiment, bacteriophage T7 was engineered to display target specific peptides against mouse tumor cell lines. Two different cell lines were used: CT-26 (colorectal cancer) and B16-F10 (melanoma). Two peptides targeting each cell lines were TCP1 and Pep42, respectively. Mice were grafted intraperitoneally with each cell line, and tumor mass was allowed to grow for 6 days. Then phage T7 displaying targeting peptides were injected into tumor mass and mice were further observed until day 17. Mice grafted with CT-26 showed 85% reduction in tumor mass when treated with phages. Mice grafted with B16-F10 showed 76% reduction in tumor mass when treated with phages. Cytokines IL1-a and TNF-a increased significantly in mice treated with phages. Macrophage infiltration into tumor mass was observed from immunohistochemistry. Thus, phage treatment could be another option as oncolytic viruses for cancer.

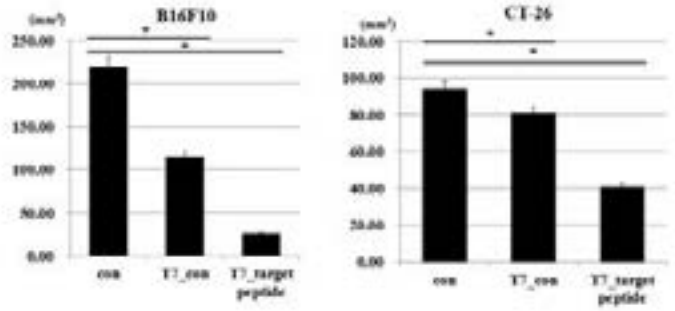

Figure 1: 85% reduction of tumor mass was observed in CT-26 and 75% reduction of tumor mass was observed in B16F10.

Biography

Yoonjung Hwang is a graduate student in Hankuk University of Foreign studies, Korea. She has been doing research on isolation of new bacteriophages from water or soil since 2015. Now she focuses on immune responses caused by bacteriophage.

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