2-1.
The efficacy of phage therapy in a murine model of Pseudomonas aeruginosa pneumonia

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The emergence of multi-drug resistant *Pseudomonas aeruginosa* necessitates the search for treatment options other than antibiotic use. The use of bacteriophages is currently being considered as an alternative to antibiotics for the treatment of bacterial infections ; however, this method has not yet been evaluated on pneumonia caused by *P. aeruginosa.* We used the potent bacteriophage KPP10 against *P. aeruginosa* strain D4-induced pneumonia mouse models and observed their outcomes. We found that the nasal inhalation of bacteriophage KPP10 (MOI = 80) significantly improved survival rate in pneumonia models ($P < 0.01$). The number of viable bacteria in the lungs decreased to undetectable levels in phage-treated mice but not in control mice ($P < 0.01$). Pathological examination showed that the phage-treated group had significantly reduced bleeding, inflammatory cell infiltration, and mucus secretion in the lung interstitium. We also measured inflammatory cytokine levels in the serum and lung homogenates of mice. In phage-treated models, serum TNF-α, IL-1β and IFN-γ levels were significantly lower ($P < 0.05$, $P < 0.01$ and $P < 0.05$, respectively) and in the lung homogenate, the mean IL-1β level in phage-treated models was significantly lower ($P <0.05$) than that of the control group. There was no significant difference in High mobility group box 1 (HMGB1) levels in both groups. Thus, our results suggest that phage therapy can potentially be used in treating lung infections caused by *P. aeruginosa* after it is evaluated more thoroughly.

2-2.
Increased Granulopoiesis in the Bone Marrow following Epstein-Barr Virus Infection

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Epstein-Barr virus（EBV）is associated with several disorders. EBV is known to modulate the proliferation and survival of hematopoietic cells such as B cells and T cells in human. However, the effects of EBV on hematopoiesis itself have not been investigated.

To study EBV infection in murine models, their hematopoiesis must be humanized, since EBV infection is limited only in some primates. To engraft the human hematopoiesis, NOD/Shi-scid-IL2rγnull（NOG）mice were used. Usually, the hematopoiesis humanized mice reconstitute only lymphoid cells, but myeloid cells are not. However, we revealed human macrophages（hMφ）and their precursor monocytes were increased in peripheral tissues of EBV-infected mice. Furthermore, our previous report indicated Mφ accumulation in spleen was essential for development of EBV-positive tumors, suggesting that EBV modulates human hematopoiesis in