

Effect of probiotics and their products on improving lung damage caused by influenza virus in mice

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Outline

1. Introduction
2. Intranasal *Bifidobacterium longum* protects against viral-induced lung inflammation and injury in a murine model of lethal influenza infection
3. The potential role of probiotics in protection against influenza a virus infection in mice
4. Conclusion

Abstract

Influenza is an acute viral respiratory disease that often causes lung damage such as cell infiltration and alveolar incompleteness during the infection process, while some studies have found that probiotics and their metabolites are beneficial to the symptoms.

Intranasal administration of *Bifidobacterium longum* 35624[®] and its cell wall to mice were found to significantly reduce the viral load within the lung and improve survival rate. Type I interferons (IFN- α , IFN- β) are known for their antiviral function, but bring severe inflammatory responses simultaneously. With the treatment of *Bifidobacterium* strains, decreases in type I interferons and the downstream cytokines were shown. Instead, the levels of type III interferons (IFN- λ) and surfactant protein D (SP-D) increased which could induce moderate antiviral responses. Probiotics treatments inhibiting influenza virus infection in various pathways: *Lactobacillus mucosae* 1025, *Bifidobacterium breve* CCFM1026 and their mixture exert different antiviral mechanisms such as changing the proportion of immune cells and cytokines, reducing viral loads and regulating short chain fatty acids (SCFA) metabolism. However, the complete antiviral mechanisms of probiotics need to be further researched.

References

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