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Co-infection of influenza A virus and Streptococcus pneumoniae in laboratory mouse

Content

Influenza viruses are the cause of highly contagious infectious diseases. Their genetic variability allows them to grow every year in human population, emerging to local epidemics, sometimes pandemics. Frequently associated bacterial co-infections are responsible for higher morbidity and mortality rates during the spread of influenza. Bacteria, commonly colonizing the upper respiratory tract mucosa, can spread to the lower parts of the respiratory tract and into the lungs. These bacterial co-infections cause middle ear inflammation, sinusitis, bronchitis, even severe necrotizing pneumonia resulting in death of the host. The severity of infection and the probability of developing pneumonia is multifactorial and includes several host and pathogenic properties, including the viral and bacterial strain, inoculum size, host immune system and time between exposure to influenza virus and bacteria.

In our work, we monitored the development of secondary bacterial infection with *Streptococcus pneumoniae* in laboratory mice primary infected with influenza virus A/NT/60/68 (H3N2). *Streptococcus pneumoniae* are one of the most common agents of secondary bacterial infections. Seven days after infection with the influenza virus, the mice were secondarily infected with different doses of bacteria. At each time interval we monitored the development of secondary bacterial infection by the *in vivo* bioimaging method. We also detected the presence of virus and bacteria *ex vivo* in various organs of mice.

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***Keywords:** Influenza A; Streptococcus pneumoniae; co-infection*

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