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Paper Poster Session III

Recent advances in molecular diagnosis and epidemiology of viral respiratory infections

Mycophenolic acid has antiviral activity against different influenza virus subtypes affecting humans

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Objective: There is an increasing number of influenza virus isolates that are resistant to neuraminidase inhibitors. In this study, we sought to evaluate the antiviral activity of mycophenolic acid (MPA) against influenza A(H1N1) and A(H7N9) virus affecting humans.

Methods: Influenza A(H1N1) and A(H7N9) virus strains used in this study were isolated from patients. The antiviral activity of MPA against influenza viruses were evaluated using cell protection assay, virus yield reduction assay and plaque reduction assay in Madin Darby canine kidney cells. Reversal of antiviral activity by the addition of guanosine or adenosine was also performed.

Results: MPA protected cells from virus-induced cytotoxicity when added 2 hours before or added at the time of virus infection (% of viable cells >50%). However, cell protection was significantly lower when MPA was added 7 hours post-infection (% of viable cells <10%). Using plaque reduction assay in which MPA was added 2 hours before virus infection, the IC_{50} was similar for A(H1N1) and A(H7N9) virus (Table 1). Virus yield reduction assay also showed that MPA inhibited virus replication (Figure 1). Addition of guanosine almost completely reverted the antiviral activity of MPA, while the addition of adenosine did not.

Conclusion: MPA is a potent antiviral against influenza viruses affecting humans, including avian-origin A(H7N9) virus. Depletion of guanosine is the likely mechanism for the antiviral effect.

Influenza virus subtype	Virus strain	Plaque reduction assay IC_{50} (micromolar)
A(H1N1)	A/Hong Kong/415742/2009	0.624
A(H1N1)	A/Hong Kong/402467/2014	0.344
A(H7N9)	A/Anhui/1/2013	0.872
A(H7N9)	A/Zhejiang/DTID-ZJU01/2013	0.919

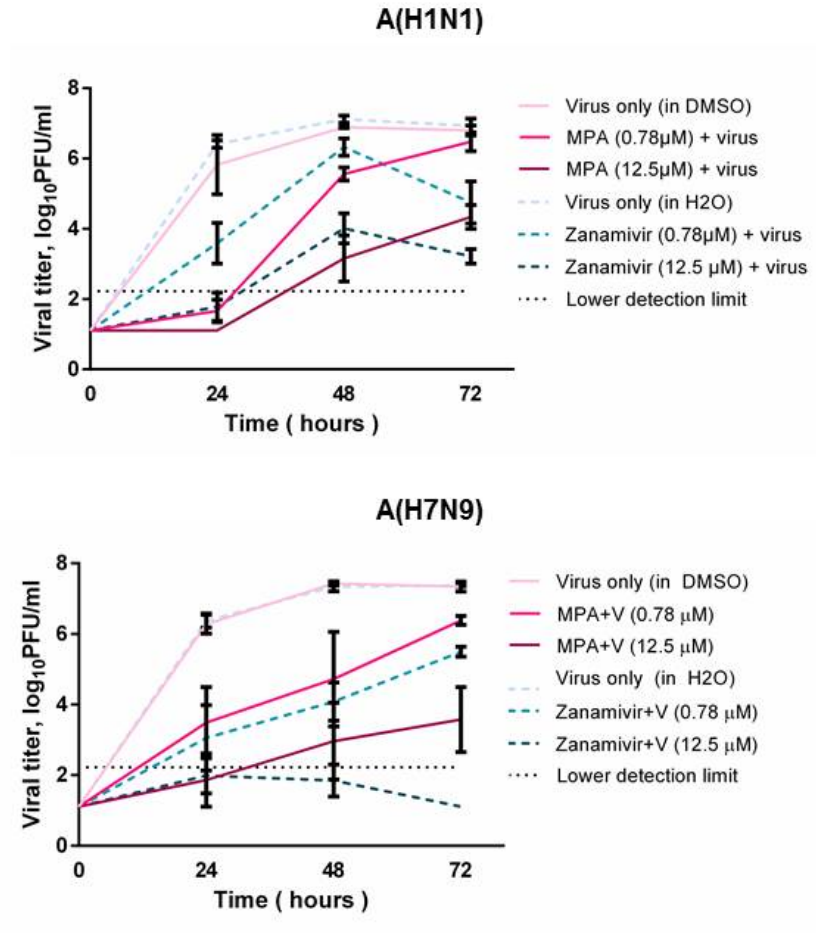

Figure 1. Antiviral activity of MPA using virus yield reduction assay