

Feruloylated Oligosaccharides Prevented Influenza-induced Lung Inflammation via RIG-I/MAVS/TRAF3 Pathway

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Abstract

Background and Purpose Uncontrollable inflammation has been the leading cause of mortality in many acute respiratory infections, including influenza. In light of the current COVID-19 pandemic, it is vital to develop valid therapeutics or supplements that are effective in suppressing lung inflammation. Feruloylated oligosaccharides (FOs) is a phytochemical constituent that exerts anti-inflammatory activities. **Experimental Approach** We established the influenza-induced lung inflammation model by infecting C57BL/6J mice or MAVS knockout (Mavstm1Zjc/J) mice with influenza A virus (H1N1). Lung index, histology analysis, hemagglutination inhibition assay as well as neuraminidase inhibition assay were performed to evaluate the therapeutic effect of FA and FOs. PCR, western blot, docking simulation and metabolomics were done to elucidate the mechanism of FOs anti-inflammatory function in lung. **Key Results** Herein, we found that oral administration of FOs moderately inhibited H1N1 virus infection and reduced lung inflammation in influenza-infected mice by decreasing a wide spectrum of cytokines in the lungs. FOs also suppressed transduction of the RIG-I/MAVS/TRAF3 signaling pathway and lowered the expression of NF- κ B. Moreover, we found that the anti-inflammatory function of FOs against influenza depends on MAVS, which is closely associated with activation of the downstream signaling cascades and the eventual production of pro-inflammatory cytokines and type I interferons. **Conclusions and Implications** In conclusion, we demonstrated that FOs is an effective anti-inflammatory agent for treating the lung inflammation caused by influenza. Such therapeutic effect was likely mediated by RIG-I/MAVS/TRAF3 signaling.

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