

Interferon inducible transmembrane protein 3 (IFITM3) inhibits influenza virus replication and inflammation by interacting with ABHD16A

Chen Liang¹, Zhu Limei², and Chen Jun³

¹Beijing Jishuitan Hospital

²Jiangsu provincial center for disease control and prevention

³Nanjing Drum Tower Hospital

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Abstract

IFITM family proteins have broad-spectrum antiviral capabilities. Preliminary studies in our laboratory have preliminarily proved that IFITMs have the effect of inhibiting influenza viruses. In order to further study its mechanism and role in the occurrence and development of influenza, relevant studies have been carried out. Fluorescence quantitative PCR detection, yeast two-hybrid test and optical confocal microscopy were used to investigate the effect of hIFITM3 on influenza virus replication, the interaction with hABHD16A and the expression of inflammation-related factors. In HEK293 cells, overexpression of hIFITM3 protein significantly inhibited the replication of influenza virus at 24h, 48h, and 72h; yeast two-hybrid experiment proved that IFITM3 interacts with ABHD16A; laser confocal microscopy observations showed that IFITM3 and ABHD16A co-localized in Cell membrane area; the expression level of inflammation-related factors in cells overexpressing hIFITM3 or hABHD16A was detected by fluorescence quantitative PCR, and the results showed that the mRNA levels of IL-1 β , IL-6, IL-10, TNF- α and COX2 were significantly increased. But when IFITM3/ABHD16A was co-expressed, the mRNA expression levels of these cytokines were significantly reduced except for COX2. When influenza virus infected cells co-expressing IFITM3/ABHD16A, the expression level of inflammatory factors decreased compared with the control group, indicating that IFITM3 can play an important role in regulating inflammation balance. This study confirmed that hIFITM3 has an effect of inhibiting influenza virus replication. Furthermore, it was found that hIFITM3 interacts with hABHD16A, following which it can better inhibit the replication of influenza virus and the inflammatory response caused by the disease process.

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