Novel Antiviral Agents for Influenza Virus Infections

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This talk will discuss several novel inhibitors for influenza virus infections. For example, LNA-1290 can inhibit influenza virus replication and reduce pathogenicity. We found that the expression of hsa-miR-1290 was increased in influenza virus-infected human cells, and the viral titer was increased in hsa-miR-1290 overexpressed cells. The results indicated that influenza A virus infection induces hsa-miR-1290 as a positive regulator for its replication. To explore the mechanism how hsa-miR-1290 regulates virus replication, we predicted the potential target genes through mRanda database, then intersected the candidate genes whose cDNA expression levels were significantly decreased in virus infected cells. One of the target genes, vimentin, was found to have an obvious decrease in hsa-miR-1290 overexpressed cells. The site-specific interaction between hsa-miR-1290 and VIM-3'UTR was also confirmed by luciferase reporter assay. We further identified vimentin as a negative regulator for influenza virus replication. Based on the aforementioned findings, we would like to use has-miR-1290 antagonist as an antiviral agent. Indeed, when we treated ferret with LNA-1290 intra nasally one day before virus infection, it was significantly reduced the induction of hsa-miR-1290 upon virus infection. Under such condition, we did observe the reduced level of viral mRNA production. Taken together, our findings provide a possible application of LNA-1290 as a novel antiviral agent.