

Novel Mechanism to Regulate Influenza A Virus Survival

Recently a group of researchers at the unit of molecular virology, Institut Pasteur of Shanghai, Chinese Academy of Sciences revealed a new mechanism to regulate the survival of influenza A virus and reported their discoveries in the *Journal of Virology* on July 24. Their article, entitled “Sumoylation of Influenza A Virus Nucleoprotein Is Essential for Intracellular Trafficking and Virus Growth”, was selected by the editor to be highlighted as a highly-recommended “spotlights”.

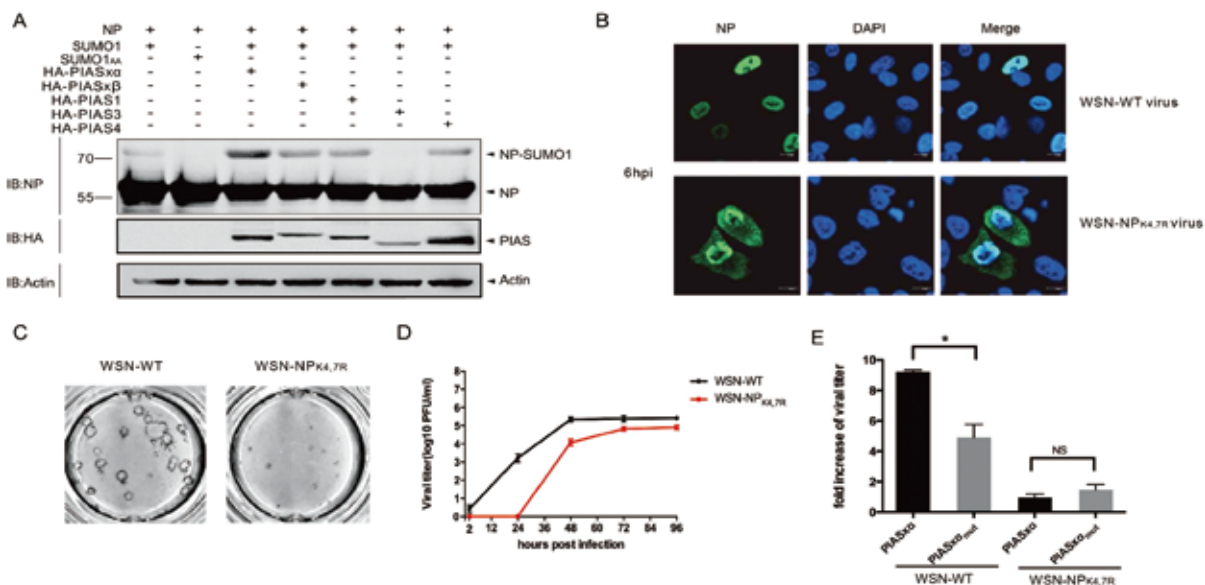
Influenza A virus is one of the main pathogen that causes flu in humans and other mammals. To survive and replicate in the host cells, influenza A virus deeply relies on the machinery from the latter. Unraveling these viral-host interactions is not only important to understanding the pathology of influenza A virus but also a basis for developing anti-viral therapy. In the year of 2010, researchers from the above-mentioned group first reported that NS1 protein of influenza A virus exploited host sumoylation system to facilitate virus growth (*Journal of Virology*, 2011, Jan. 85(2):1086–98). Following this work, they further identified that nucleoprotein (NP) of influenza A virus is also a bono fide target of Sumoylation. NP protein functions as a major

component of viral replication complex and is the central target for anti-viral drugs. By using reverse genetic technology, researchers rescued the recombinant sumoylation-deficient WSN-NPK4,7R virus, which was found to be highly attenuated with a short life cycle. They further found that the sumoylation of NP guarantees a proper nuclear localization for sufficient virus replication. They also identified PIASx as the specific E3 ligase for NP to facilitate virus growth. Notably, they uncovered that sumoylation of NP is widely conserved among subtypes of influenza A viruses, including the high pathogenic H5N1 and the newly emerged H7N9 viruses. This study reveals that sumoylation of NP is an important mechanism for the survival of influenza A virus in host cells, and also indicates that viral sumoylation could be served as a target for developing universal anti-viral drugs.

The project was supervised by Prof. SUN Bing and completed mainly by Dr. XU Ke and Ph.D. student HAN Qinglin. It was supported by the Natural Science Foundation of China and the CAS Youth Innovation Association.

For more information please refer to:

<http://jvi.asm.org/content/88/16/8719>



Sumoylation of influenza A virus NP protein revealed to regulate intracellular localization and survival of the virus.