

International Conference on **Influenza**

August 24-26, 2015 London, UK

Mechanism and functional studies on sumoylation of influenza A virus nucleoprotein

Ke Xu

Institute Pasteur of Shanghai, China

To establish efficient infection in host cells, viruses rely on cell machinery for its own benefit. One example of a key cellular signaling targeted by viruses is host post-translational modifications. Recently, it has been reported that influenza A virus proteins interact extensively with host sumoylation systems, and several viral proteins, such as NS1, M1 and NP are sumoylated to facilitate virus growth. In our recent work, by screening viral proteins that constitute influenza A virus viral ribonucleoproteins (vRNP), we found nucleoprotein (NP) to be a bonafide target of sumoylation in both transfected and infected cells. We further identified the sumoylation sites of NP locate at the very N-terminal lysines, which is highly conserved among different influenza A subtypes and strains including the newly discovered human H7N9 virus. Interestingly, a caspase-cleaved NP with 1-16aa deletion was not sumoylated by losing the N-terminal lysines. Functionally, sumoylation of NP does not affect the polymerase activity but regulate the transport dynamics of NP. As a consequence, the NP sumoylation-defective virus is highly attenuated as compared to WT virus. Morphologically, the NP sumoylation-defective viruses form filamentous particles, while WT viruses exhibit spherical phenotype. Besides, we found that knocking down Ubc9 decreases viral sumoylation and attenuates virus growth, while over-expression of PIASx_a enhances NP sumoylation as well as virus growth. These data indicate that sumoylation of viral proteins; especially NP protein is essential for virus production in infected cells and plays an important role in determining the virus morphology.

Biography

Ke Xu has completed her PhD from Shanghai Institutes of Biological Sciences, Chinese Academy of Sciences, and joined Institute Pasteur of Shanghai as an Assistant and then Associate Principal Investigator. Her research Interests are virus-host interactions of influenza A virus, specially post-translational modifications of viral proteins. She has published 20 papers in reputed virology journals. Her recent work of FluA NP sumoylation was published in *Journal of Virology* as Spotlight paper where she contributed as the corresponding author. She has also served as an Editorial Board Member of reputed journal, *Archive of Virology*.

kxu@sibs.ac.cn

Notes: