HOKKAIDO UNIVERSITY

AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

Ambitious 物質科学セミナー

"A ΩXaV motif in the Rift Valley fever virus NSs protein is essential for degrading the p62 subunit of TFIIH, forming nuclear filaments and virulence"

Prof. James G. Omichinski

Department of Biochemistry and Molecular Medicine, Université de Montreal

平成 27 年 3 月 24 日(火)13:45~14:30
北海道大学 理学部 6 号館 204−02

Rift Valley fever virus (RVFV) is a single-stranded RNA virus and the causative agent of the zoonotic vector-borne disease Rift Valley fever. Although RVFV is considered a tropical virus, like other tropical hemorrhagic fever viruses including Ebola, there is increasing concern that it will become more prevalent in other regions of the world due to vector migration as a result of rising global temperatures. A key component of RVFV virulence is its ability to form nuclear filaments through interactions between the viral non-structural protein NSs and the host general transcription factor TFIIH. We have identified an interaction between a ΩX*a*V motif in NSs and the p62 subunit of TFIIH. This motif in NSs is similar to ΩX*a*V motifs found in nucleotide excision repair (NER) factors Rad2 and Rad4 and the general transcription factor IIE known to interact with p62. Structural and biophysical studies demonstrate that NSs binds to p62 in a similar manner as these other DNA repair and transcription factors. Functional studies in RVFV-infected cells show that the ΩX*a*V motif is required for both nuclear filament formation and degradation of p62. Consistent with the fact that the RFVF can be distinguished from other *Bunyaviridae*-family viruses due to its ability to form nuclear filaments in infected cells, the motif is absent in the NSs proteins of other *Bunyaviridae*-family viruses. Taken together, our studies demonstrate that p62 binding to NSs through the ΩX*a*V motif is essential for degrading p62, forming nuclear filaments and enhancing RVFV virulence. I will discuss how the RVFV has incorporated a simple motif into the NSs protein that enables it to functionally mimic host cell proteins that bind the p62 subunit of TFIIH.

連絡先：北海道大学大学院理研究院化学部門 坂口和靖

(Tel: 011-706-2698, Mail: kazuyasu@sci.hokudai.ac.jp)