Insight into the Ebola virus nucleocapsid assembly mechanism

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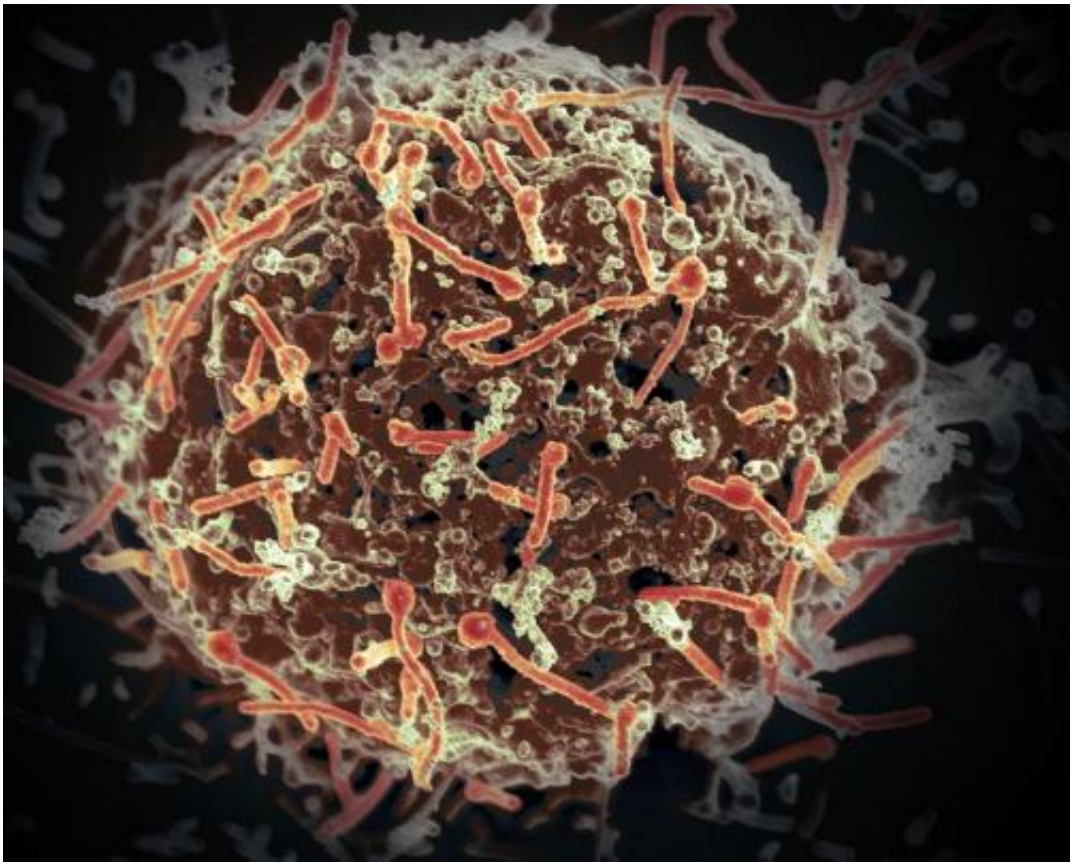

The Ebola virus, isolated in November 2014 from patient blood samples obtained in Mali. The virus was isolated on Vero cells in a BSL-4 suite at Rocky Mountain Laboratories. Credit: NIAID

The Ebola virus (EBOV) causes lethal hemorrhagic fever in humans, with extremely high morbidity and mortality. It was first discovered in

two simultaneous outbreaks near the Ebola River in sub-Saharan Africa in 1976. Sporadic outbreaks followed until 2014, when it re-emerged in Western Africa and caused a widespread epidemic. As of 24 April 2015, the World Health Organization (WHO) has reported a total number of 26,101 suspected cases and 10,824 deaths. Despite the high death rate of the Ebola hemorrhagic disease, there are no FDA-approved treatments or vaccines available to date, nearly 40 years after the initial outbreak.

For decades, numerous research works have identified the structures of most EBOV encoded proteins except two, the L protein and nucleoprotein (NP), because of the difficulties they present in the expression, purification and crystallization process. Recently, researchers from Nankai University and the Tianjin International Joint Academy of Biotechnology & Medicine identified the structure of the EBOV NP core domain and published their findings in Springer's open access journal *Protein & Cell*.

NP plays the essential role in the EBOV life cycle, by facilitating viral RNA encapsidation to form a ribonucleoprotein complex. The structure of EBOV NP, solved to 1.8 Å resolution, reveals how EBOV NP clamps an RNA binding groove between its two lobes, which presents similarities with the other reported viral NPs from the Mononegavirales order. This structural information should provide valuable insights to help us understand the EBOV genome assembly and transcription mechanism. In addition, the researchers identified a highly conserved hydrophobic groove on the surface of EBOV NP, which provides great potential for the development of antiviral therapies targeting EBOV RNP formation.

More information: Dong, S. et al. (2015). Insight into the Ebola virus nucleocapsid assembly mechanism: crystal structure of Ebola virus nucleoprotein core domain at 1.8 Å resolution, *Protein & Cell*, Open Access: link.springer.com/article/10.1 … 07/s13238-015-0163-3

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