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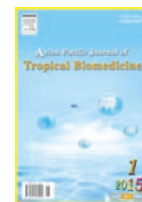


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Ebola viral selenoproteins: a metallomics analysis

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ABSTRACT

Ebola virus infection is the present public health problem. The trend of worldwide epidemic becomes the serious consideration for this infection. The Ebola virus infection has main clinical manifestation as acute febrile illness with hemorrhagic episode. The problem of hemostatic disturbance can be seen. Focusing on the pathophysiology, selenium plays an important role in the blood clotting regulation. The study on the selenoprotein of the Ebola virus can be useful for further understanding on the pathology of the infection. Here, the authors use metallomics analysis for assessment of Ebola virus genome. According to this study, the selenoprotein portion within Ebola virus genome can be detected at position 1046-1115.

1. Introduction

Ebola virus infection is the present public health problem. The trend of worldwide epidemic becomes the serious consideration for this infection[1,2]. The Ebola virus infection has main clinical manifestation as acute febrile illness with hemorrhagic episode[3-5]. The problem of hemostatic disturbance can be seen. Focusing on the pathophysiology, there are several pathological processes underlying the hemorrhage and the importance of the biometal should also be mentioned. Clinically, selenium plays an important role in the blood clotting regulation.

The role of selenium in viral hemorrhagic fever is an interesting topic in biometal study[6]. Selenium plays important role in “removing excessive hydroperoxides” and this is important for the control of platelet functional activity[7]. Ramanathan

and Taylor mentioned that “one potential viral selenoprotein may contain up to 16 selenium atoms per molecule[6]” and “biosynthesis of this protein could impose an unprecedented selenium demand on the host, potentially, leading to severe lipid peroxidation and cell membrane destruction, and contributing to hemorrhagic symptoms[6]”. However, Ramanathan and Taylor did not report for the specific selenoprotein within Ebola virus. Here, the authors use the new omics technique, metallomics technique for determination of selenoprotein within Ebola virus genome.

2. Materials and methods

In this study, the authors used metallomics analysis for assessment of Ebola virus genome. The template genome for the metallomics analysis is derived from referencing genome database (accessible via PubMed). In the present study, the “Zaire ebolavirus isolate Ebola virus H.sapiens-tc/COD/1976/Yambuku-Mayinga, complete genome (NCBI Reference Sequence:

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NC_002549.1)” was used. The standard metallomics analysis tool proposed by Mariotti *et al*[8]. The tool is namely SECISearch3 and Seblastin[8]. The main concept is to detect “uncommon amino acid selenocysteine (Sec), which is inserted by a specific translational machinery that recognizes a stem-loop structure, the SECIS element, at the 3’ UTR of selenoprotein genes and recodes a UGA codon within the coding sequence[8].”

3. Results

According to this study, the selenoprotein portion within Ebola virus genome can be detected at position 1046-1115 (Figure 1).

SEQ UCAGUAGGCACAUGAUGGUGAUUUUCCGUUGAU
GCGAACAAAUUUCUGAUCAAAUUUCUCCAAUAC
SS ..([(((.....{[[{(((((.....(((
..)))))))))}}]}).....)))])..

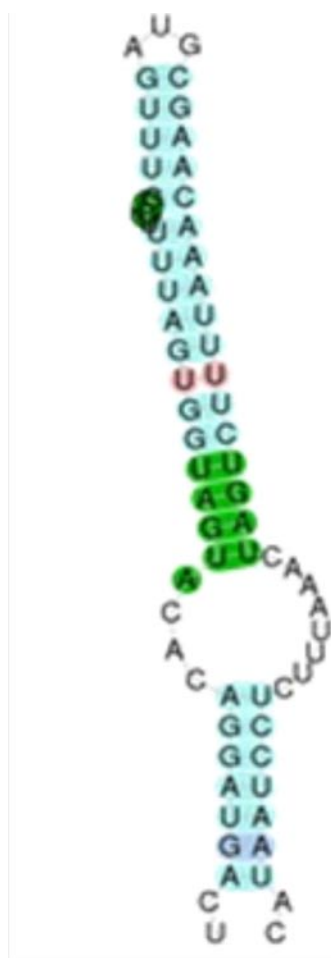


Figure 1. Selenoprotein detected in Ebola virus genome.

4. Discussion

Role of selenium in antioxidant problem is well-known and this can link to the pathogenesis of the viral infection[9]. Selenoprotein

is a metalloprotein that has an Sec. It can play important roles in hemorrhagic problem in viral hemorrhagic fever[3]. In this short report, the authors use metallomics technique for determination of selenoprotein within the problematic Ebola virus genome. To search for the selenoprotein can be the key point for better understanding on the hemorrhagic episode due to the infection. Also, the design of specific molecule to manipulate on the detected selenoprotein can be a clue for further management of the hemorrhagic complication of the infection.

Conflict of interest statement

We declare that we have no conflict of interest.

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