

Ebola Virus Hemorrhagic Fever

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This past year has seen the largest Ebola virus outbreak on record, centered in West Africa in Guinea, Liberia, and Sierra Leone.¹ Cases were first reported in Guinea on March 21, 2014; by March 30, cases were reported in Liberia and in May Sierra Leone also reported cases. At the time of this writing, within these three countries, there have been 22,444 cases, with 13,810 cases being laboratory-confirmed.² There have been 8959 deaths, although the number may be higher due to under-reporting. Organizations from several countries have been working to defeat this disease, by treating the sick patients, by providing infrastructure, and by tracing and monitoring contacts of the patients.

Tissue specimens were collected for electron microscopy in a previous Ebola virus outbreak in 1995. Overwhelming viremia was present, as evidenced by the presence of numerous Ebola virus particles in the blood vessels. In the liver, a large number of viral particles, both normal and aberrant, were present in the sinusoids. Large filamentous inclusions, indicative of viral replication, were observed in hepatocytes, and infected cells were particularly concentrated close to the portal tract (Fig 1). Proliferations of the plasma membranes of infected cells were commonly noted. In the lung, mature Ebola virus particles were observed in the interstitium and within the alveolar space (Fig 2), and viral inclusions were seen in alveolar macrophages and in endothelial cells. In the dermis of the skin, mature particles were observed in the connective tissue matrix, and inclusions were present in endothelial cells (Fig 3).

The presence of mature virus particles in the dermis of the skin and in the alveolar space of the lung may have important implications in terms of person-to-person transmission. The involvement of endothelial cells may explain the increased vascular permeability and shock seen in patients. Electron microscopic studies should further our understanding of the pathology and pathogenesis of this devastating disease.

References

[1] CDC, *MMWR* **63**(2014)548.

[2] <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>

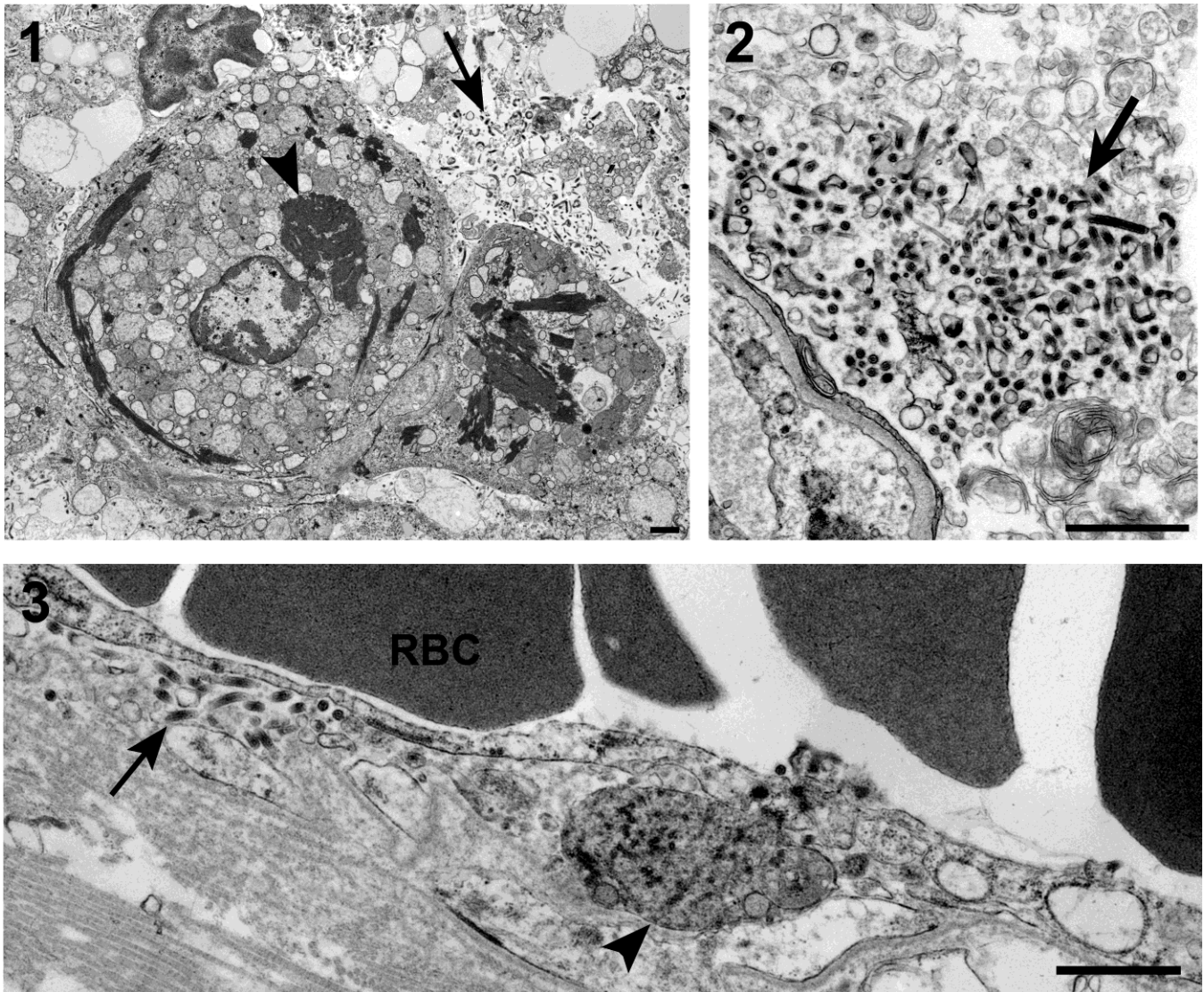


FIG 1. Large viral inclusions (arrowhead) in hepatocytes of liver from a patient who died of Ebola virus hemorrhagic fever. Mature virus particles (arrow) are within the sinusoid. FIG 2. Virions are found in the alveolar space of the lung. FIG 3. Ebola virus inclusion (arrowhead) in endothelial cell in the dermis of the skin. Virus particles (arrow) are seen within the connective tissue matrix. RBC, red blood cell. Bars, 1 μ m.