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Hantavirus infection suppresses thrombospondin-1 expression in cultured endothelial cells in a strain-specific manner

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Abstract

© 2016 Khaiboullina, Morzunov, St. Jeor, Rizvanov and Lombardi. Hantavirus infection is associated with two frequently fatal diseases in humans: Hemorrhagic fever with renal syndrome (HFRS) and hantavirus pulmonary syndrome (HPS). The pathogenesis of hantavirus infection is complex and not fully understood; however, it is believed to involve virus-induced hyperinflammatory immune responses. Thrombospondin-1 (THBS1) is a large homotrimeric protein that plays a putative role in regulating blood homeostasis. Hyperresponsiveness to inflammatory stimuli has also been associated with defects in the THBS1 gene. Our data suggest that hantavirus infection of human umbilical cord vein endothelial cells (HUVEC) suppress the accumulation of THBS1 in the extracellular matrix. Additionally, this suppression is dependent on virus replication, implying a direct mechanism of action. Our data also imply that the pathogenic Andes and Hantaan strains inhibit THBS1 expression while the non-pathogenic Prospect Hill strain showed little inhibition. These observations suggest that a dysregulation of THBS1 may contribute to the pathogenesis of hantavirus infection.

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Keywords

Andes, Coagulation, Hantaan, HFRS, HPS, Prospect hill, THBS1, TSP1