Human Rhinovirus 14 RNA Dynamics During Entry and Establishment of the Viral Replication Complex

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Introduction: The Human Rhinovirus (HRV) 14 belongs to the major group of Rhinoviruses and use ICAM-1 as its receptor. The mechanism of entry used by the minor group is well known while many questions are still open for the major group. Mainly, the dynamics of the HRV14 RNA during infection is still to be revealed. Recently, researchers described that myosin 5A (Myo 5A) is important to transport of neuronal RNAs. Accordingly, we are investigating the possibility that the virus can subvert this motor protein during different phases of infection.

Methods: We investigated the RNA distribution in HRV14 infected cells (TCID50=20) using confocal microscopy imaging of viral labeled RNA (BrU) at different times of infection (from 5 to 180 minutes post infection).

Discussion and Results: We observed the presence of viral RNA inside the cytosol after 15 minutes with concomitant change in myo5A distribution pattern indicating a role of Myo 5A in the entrance of viral RNA. To explore the role for myosin in a crucial moment of progeny generation, the appearance of replication complex, we labeled all new RNA synthesized inside the cell after infection and using the viral endogenous RNA synthesis shutdown effect we could observe the viral RNA replication complex (RC) formation in 90 minutes after infection. The formation of RC for HRV14 is chronologic similar to others members of Rhinovirus family. Similarity in the distribution of the RC and myo5A was not observed. When testing other members of the myosin family we observed similar distributions of Myo5B and the RCs. This data suggest that myo5B was used as scaffold for RCs of HRV14.

Conclusion: HRV14 can subvert myosin 5 family members during infection for the delivery of RNA to polyprotein translation site and serve as scaffold to RC formation.

Keywords: HRV14, Myosin, RNA

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