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New antiviral strategies towards discrimination of viral innate immune evasion and antiviral drug resistance

RNA viruses have evolved very fast due to high degree of mutation rate in their genome. Due to this high mutation rate and subsequently antiviral resistance developed by viruses, many FDA (Food and Drug Administration) approved antiviral drugs are being restricted in clinical settings. Antiviral resistance means that a virus is changed in such a way that the antiviral drug becomes less effective in treating infections caused by that virus. The therapeutic efficacy of current interferon (IFN) against RNA viruses is constantly becoming less effective, even tolerant with great side effects. Many notorious RNA viruses have been shown to escape the host immune defence by blocking the function of retinoic acid-inducible gene-1 (RIG-I) and also IFN-signaling. We have investigated immunostimulatory and antiviral effect of a RIG-I agonist 3p-RNA molecule that potentially produces IFN in Hepatitis C and Yellow Fever virus replicating cells and also enhances IFN-signaling to provide an antiviral state. The anti-viral effect of 3p-RNA seems to be superior to recombinant IFN-alpha. Also influenza targeted FDA approved antiviral drugs rimantadine and amantadine have been shown to be ineffective because influenza has developed resistance against it. New antiviral drug strategies are based on understating the molecular mechanism involved in influenza viral infections and viral host factors that supports the virus replication. We have studied that influenza activates and utilizes calcium dependent PKC-alpha mediated MAPK signaling-cascade for their efficient replication and using calcium antagonist impairs this virus host essential function leading to strong reduction in influenza replication. Calcium antagonist does not allow influenza to develop resistance against it however Oseltamivir does. This suggests that host essential factors of influenza targeted by calcium antagonist could be an interesting new antiviral strategy.

Biography

Mohammad Intakhab Alam earned his PhD from University of Giessen, Germany in early 2008 and continued Postdoctoral studies at the Institute of Medical Virology, University of Zurich Switzerland and University of Bonn, Germany. He is currently an Assistant Professor of Medical Microbiology/Virology at EBN-Medical School, Zirve University, Gaziantep, Turkey. He has worked on many human RNA viruses (Influenza, HCV, YFV, HEV and RSV) and published interesting antiviral research work and has great research interest in therapeutic interventions. He has served as an Editorial Board Member of a Journal and currently full member of the prestigious American Society for Virology and International Society for Antiviral Research.

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