Active NF-kappaB signalling is a prerequisite for influenza virus infection.

Influenza virus still poses a major threat to human health. Despite widespread vaccination programmes and the development of drugs targeting essential viral proteins, the extremely high mutation rate of influenza virus still leads to the emergence of new pathogenic virus strains. Therefore, it has been suggested that cellular cofactors that are essential for influenza virus infection might be better targets for antiviral therapy. It has previously been reported that influenza virus efficiently infects Epstein-Barr virus-immortalized B cells, whereas Burkitt's lymphoma cells are virtually resistant to infection. Using this cellular system, it has been shown here that an active NF-kappaB signalling pathway is a general prerequisite for influenza virus infection of human cells. Cells with low NF-kappaB activity were resistant to influenza virus infection, but became susceptible upon activation of NF-kappaB. In addition, blocking of NF-kappaB activation severely impaired influenza virus infection of otherwise highly susceptible cells, including the human lung carcinoma cell lines A549 and U1752 and primary human cells. On the other hand, infection with vaccinia virus was not dependent on an active NF-kappaB signalling pathway, demonstrating the specificity of this pathway for influenza virus infection. These results might be of major
importance for both the development of new antiviral therapies and the understanding of influenza virus biology.