Bovine Lactoferrin Inhibits Early Steps of Yellow Fever Virus Infection

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Yellow Fever Virus (YFV) is an endemic arbovirus in tropical areas, having a global impact in public health. There are no effective antivirals currently available for the treatment of flavivirus infection in humans. Bovine Lactoferrin (bLf), a multifunctional glycoprotein found in milk and other secretions such as tears and saliva, shows numerous biological roles including immune modulation, antibacterial and antiviral activities. Here, we aim to address the antiviral activity and the way by which bLf acts against YFV infection in Vero cells. MTT assays indicate that bLf does not lead to cytotoxic effects on 7 days of treatment. Our data of plaque assays show that the presence of bLf during the whole infection process promotes over 70% inhibition of YFV infection. In order to investigate whether bLf interferes in the viral adsorption stage or in viral replication, bLf was added in different steps of infection. The presence of bLf only in early steps of infection resulted in a large inhibition of 65%. On the other hand, the presence of bLf only after viral adsorption and penetration leads to a slight inhibition (<10%) of infection. Alternatively, we tested whether bLf has the ability to bind to viral particles, analyzed by plaque assays. Despite apparently positive results, new tests are in course for a better evaluation. Our findings suggest that bLf is able to inhibit YFV infection, mainly on its early steps. Thus, due to the absence of effective therapies against this arbovirus, the finding of antiviral agents is extremely important.

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