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Evaluation of novel phosphorylated derivatives of abacavir for antiviral activity in DF-1 cells infected with Newcastle Disease Virus (NDV)

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Newcastle Disease Virus (NDV) is a poultry virus which affects more than 200 species of birds, belong to the family paramyxovirus; the austerity of the disease depends on the strain infected. Since no antiviral drugs are effective against NDV, hence the aim of the preset study was to enhance the antiviral activity, bioavailability and decrease cytotoxic concentrations, a series of novel phosphorylated drugs were designed for Abacavir and QSAR studies were carried out against NDV fusion protein. Of the designed 16 analogues ABC-1, ABC-4 and ABC-12 were selected for synthesis depending on the best binding affinity, docking scores and drug likeness properties of the ligands. The selected compounds were synthesized and characterized by IR, ¹H, ¹³C and ³¹P NMR, CHN analysis and Mass spectra. Cytotoxicity of the synthesized compounds was determined by MTT assay and phosphorylated ABC-1 showed less cytotoxicity than parent ABC. Tissue culture infectious dose (TCID₅₀) for NDV virus was determined as 105.49/100 µL and was used to infect the DF-1 cells. Antiviral activity for these compounds was assessed by the cytopathic effect inhibition and plaque inhibition assays. Of the tested three compounds, ABC-1 compound shows more CPE inhibition and ABC-1 inhibited more plaque at lower concentration 87.5 µg/mL than that of parent ABC at 100 µg/mL. These findings suggest that these novel phosphorylated ABC compounds may enhance the *in vitro* antiviral activity against NDV in DF-1 cells.

Biography

Suresh K A has completed his Postgraduate degree in the Department of Biotechnology, Dravidian University and he is currently pursuing PhD under the guidance of Dr Lokanatha Valluru, Assistant Professor, Department of Biotechnology, Dravidian University, Kuppam. Besides he has also worked as Junior Scientist from June, 2012 to November, 2013 in Aptus Biosciences Pvt Ltd (CRO) in genetic toxicology studies and presently working on antiviral activity of phosphorylated compounds against NDV infection.

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