

PH-MEDIATED INHIBITION OF HERPES SIMPLEX VIRUS

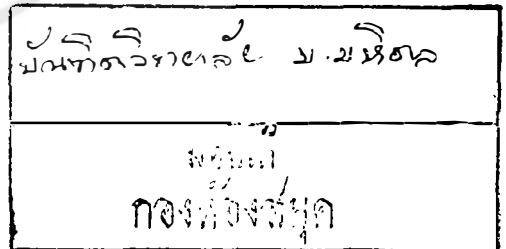
TYPE 2 EXPRESSION IN VITRO

BY

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Thesis Title; pH-MEDIATED INHIBITION OF HERPES SIMPLEX VIRUS TYPE 2
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Abstract

Herpes simplex virus type 2 (HSV-2) causes genital herpes infection. This virus can remain indefinitely in the infected host and causes periodic recurrence of the disease. Herpes simplex viral infection is particularly vulnerable in infants born of infected mothers. In addition, HSV-2 is also associated with the development of cervical carcinoma. Many stimuli, such as, environmental and physiological factors are known to provoke the recurrent infection. One of these factors, the environmental pH condition, which might interfere with the expression of virus was studied in vitro. The results revealed that the yield of infectious virus was pH and cell-type dependent. The pH optimum for viral growth was in the range 7.5 to 8.0 in Vero, HeLa and HEp-2 cells. The virus yield in Vero cells infected with HSV-2 at 0.1 plaque forming unit per cell, and maintained at pH 7.5 for 24 hours was 300 and 1000 times greater than those in HeLa and HEp-2 cells, respectively. At a suboptimal pH of 6.5, the virus yield in these three cell lines decreased, but it could be induced to its maximal level within six to 12 hours by shifting the pH up to optimum. Moreover, at pH 6.5, there was a relationship between the multiplicity of infection and the virus yield. When the pH-mediated inhibition of HSV-2 expression in Vero cells was studied by immunological means, it was revealed that at suboptimal or acid pH 1), there was an impairment in the synthesis of HSV-2 specific antigens in the infected cells; expression of antigens on the cell surface also declined, and 2), there was a decrease in the number of cells synthesizing HSV-specific antigens. In addition, polykaryon formation was inhibited. This suggests that acid pH of the culture medium interferes with viral

protein synthesis and expression. These affected proteins might be important in the maturation of the infectious virion and also in the spread of virus from cell to cell. Thus, physiological pH change, especially that in the female genital tract during the menstrual cycle, may be one of the important factors contributing to the establishment of the latent stage and the recurrence of the disease.

