A NOVEL BROMHIDE SALT VIRUCID ACTIVE

ABSTRACT

Several studies have identified core promoter mutations in various hepatitis B virus (HBV) patients' populations that share the phenotype of more aggressive liver disease or different response to therapy. In order to study the genetic variability of the basic core promoter, sequences from Uruguayan patients as well as 54 HBV strains isolated elsewhere were aligned, and the conservation of each particular position as well as the genetic distances among all the strains were determined. These studies revealed an extensive degree of genetic heterogeneity of HBV basic core promoter. Mutations described to be related to specific phenotypes are produced in positions that have 60% or less conservation among all the strains suggesting that these positions are not relevant for promoter functions. The results of this study suggest that different set of mutation combinations may give rise to specific phenotypes as HBV continues to evolve and that extreme care should be taken in assigning mutations to specific traits.

A bromhide salt (commercial disinfectant*) was tested for virucidal activity against enveloped and non-enveloped viruses and for toxicity evaluation on human and monkey cell lines. The product is a commercial disinfectant based on a biocide alkil-amine-Lauril Dimetilbenzilammonium-Bromide, which belongs to a group of positive charged-active alkylamine biocides. These biocides interact with guanine nucleotide triphosphate-binding proteins (G proteins), affecting thereby signal transduction in a variety of cell types.

The direct antiviral activity is not totally clear, but it probably has an effectiveness similar to that achieved with UV radiation. However, other authors show that the possible HIV-1 inhibitory activities of other bromides salts could inhibit lymphoproliferation. Since HIV-1 requires proliferating lymphocytes for its replication, and HIV-1 uses G-protein-coupled proteins as cofactors for entry into CD4+ T cells, the fact that Bromide salts interact with G proteins makes them all the more potential HIV virucidal.

In our study, the disinfectant shows virucidal activity against Herpes Simplex Type 2, used in this study as a model of...
enveloped virus, in 15 minutes of contact, at the following dilutions: pure, 1:2, 1:5, and 1:10, while for Adenovirus Type 3, used as a model of non-enveloped virus, the salt shows virucidal activity in 15 minutes of contact, at the following dilutions: pure, 1:2, and 1:5, as shown in figure 1. Cytotoxical effects were observed on the cell lines Hep2, for dilutions pure and 1:2, while for Vero those effects were present with the pure salt solution only. These cells were used as models of continuous cell lines.

A major obstacle to consistently demonstrating these levels of virus inactivation is the cytotoxicity induced by the disinfectant. Different methods were applied to inactivation tests. In this study, we have selected the dilutions of the virus disinfectant mixtures in cell cultured medium, although this procedure requires high titers of virus in order to visualize infectivity reduction over the cytotoxic background. Other methods suggested in literature are virus neutralization using skimmed milk, leethen broth or removal of the biocide before virus assay.

Nevertheless, the results of this study show that the alkyl-amine-Lauryl Dimethylbenzilammonium-Bromide appears to be an effective virucidal disinfectant at the concentration recommended by the manufacturer, its use being indicated for inanimate surfaces only, such as laboratorial and surgical equipment and instruments.

![Figure 1: Hep2 Virus neutralization of Adenovirus by the bromide salt in Hep2 continuous cell lines (left); Control virus well showing cytopathic effects of Adenovirus dilution $10^{-2}$ in Hep2 continuous cell lines](image-url)

REFERENCES:


