

Extracts From:  
"Medical Aspects and Applications  
of Humic Substances"  
Regarding the Antiviral Activity of Humic  
Substances

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**MULTIPLE VIRUSES INHIBITED**

"Preliminary in-vitro studies with Coxsackie A9 virus, influenza A virus and herpes simplex virus type 1 (HSV-1) have already shown that (Humic Substances) are effective against both naked and enveloped DNA viruses (Klocking and Sprosig, 1972, 1975; Thiel et al., 1977)."

"Further investigations corroborate the ability of (Humic Acid) to inhibit selectively viruses for human immunodeficiency virus type 1 (HIV-1) and type 2 (HIV-2), cytomegalovirus (CMV) and vaccinia virus (Schols et al., 1991; Neyts et al., 1992)."

**VIRAL FUSION INHIBITION**

"With most viruses, the inhibitory effect of (Humic Acid) is directed specifically against an early stage of virus replication, namely virus attachment to cells (Klocking and Sprosig, 1975; Schols et al., 1991; Neyts et al., 1992)."

"...it appears likely that the poly-anionic Humic Acids occupy positively charged domains of the viral envelope glycoproteins, which are necessary for virus attachment to the cell surface (Neyts et al., 1992)."

**HERPES**

"The effect of (Humic Acids) on an early stage of herpes virus replication has been confirmed by the results of animal experiments. The number of lesions in the cornea of HSV-1-infected rabbits was strongly reduced when a solution of the (Humic Acid) was applied into the conjunctival sac of the eye along with or immediately after the infectious agent."

"Current interest is directed to the prophylactic effect of (Humic Acids) on recurrent HSV infection."

"It is known that topical application of (Humic Acid) may significantly reduce or even completely suppress experimentally induced herpes in the mouse ear (Durre and Schindler, 1992), though the mechanistic basis of this effect remains to be elucidated."

## **HIV**

"A low-molecular weight (Humic Acid) (HS 1500, M.W. = 1500 Daltons), was found to strongly inhibit HIV-1 in vitro (Schneider et al., 1996)."

## **NON-IRRITATING**

"Studies on the mechanism of action revealed virus penetration into host cells as the target of the anti-HIV-1 activity. (Humic Acid) has passed a panel of pre-clinical tests including eye irritation according to Draize, as well as pregnancy risk in rats. Neither sensitizing nor irritating effects were detectable in concentrations of up to 10% HA (Wiegleb et al., 1993; Lange et al., 1996a,b)."

## **CONCLUSION**

"Taken together, results so far show that HS are promising candidates for prophylactic rather than therapeutic use in the treatment of viral diseases."

**Editor's Note:** This last conclusion is based only on the limited studies referred to above. These studies show that Humic Acid is first a preventative, because it interferes with a virus' ability to attach to a host cell, penetrate the host cell, and reproduce itself. Scientific studies have demonstrated that if a host cell is penetrated before the introduction of the Humic Acid, the reproductive process is not halted. HOWEVER, after the virus reproduces, the host cell releases the new viruses into the bloodstream. At this point, if Humic Acid is present, it can prevent the new generation(s) of viruses from attaching to additional host cells. This is a therapeutic action that the above research has not specifically verified in procedure, hence the above conclusion.

Further, the interaction of Humic Acid regarding the aforementioned viral studies would also be presumed to work for most if not all viral diseases. Other studies are currently on going throughout the world.