

## **Biologic Effects Of Aloe Vera Gel**

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### **Antibacterial/antifungal/antiviral effects**

Streptococcus pyogenes and Streptococcus faecalis are two microorganisms that have been inhibited by aloe vera gel (23,24). Hegggers et al suggested that the antibacterial effect of the aloe vera gel in vivo could enhance the wound healing process by eliminating the bacteria that contributed to inflammation (25). Aloe vera gel reportedly was bactericidal against Pseudomonas aeruginosa while acemannan prevented it from adhering to human lung epithelial cells in a monolayer culture. A processed aloe vera gel preparation reportedly inhibited the growth of Candida albicans (23). In terms of antiviral effects, acemannan reduced herpes simplex infection in two cultured target cell lines (26). In a study Saoo et al noted that fractions of aloe vera gel containing lectins directly inhibited the cytomegalovirus proliferation in cell culture, perhaps by interfering with protein synthesis (27). Sydiskis et al tested a purified sample of aloe emodin on the infectivity of herpes simplex virus Type 1 and Type 2 and found that aloe emodin inactivated all of the viruses, including varicella-zoster virus, influenza virus, and pseudorabies virus (28). Electron micrograph examination of anthraquinone-treated herpes simplex virus demonstrated that the envelopes were partially disrupted. These results showed that anthraquinones extracted from a variety of plants (including aloe vera) are directly virucidal to enveloped viruses (29). In a 2003 study by Barrantes and Guinea, a collagenase from Clostridium histolyticum was dose-dependently inhibited by aloe vera gel and an active aloe vera gel fraction containing phenolics and aloins; aloe vera gel and aloins also were effective inhibitors of stimulated granulocyte matrix metalloproteinases (MMPs). The authors observed some chemical structural similarities between the aloins and the MMP inhibitory tetracyclines and finally suggested that the aloe derivatives could inhibit the MMPs through a mechanism similar to that of inhibitory tetracyclines such as doxycycline.

An important finding by Zimmerman was that these effects of aloe vera were not apparent until there was at least 70% concentration of the gel. To achieve 70% or more concentration an aloe vera gel must be stabilized with antioxidants in order to minimize the otherwise necessary preservatives which lessens the percentage of aloe vera in the product (30). According to George D aloe must not be treated with excessive heat or filtered during the manufacturing process, as this destroys or reduces the effects of certain essential compounds such as enzymes or polysaccharides (31).