Title:
Viroplazin: A Broad-Spectrum Antiviral Agent that Stimulates Endogenous Hypothiocyanite Production Through a Novel Supramolecular Complex

Abstract:
The increasing threat of viral resistance and the need for rapid response to emerging pathogens necessitate alternative antiviral strategies in both veterinary and human medicine. Viroplazin is a novel supramolecular complex composed of a mandelonitrile glycoside isomer and sodium thiosulfate. This molecular complex offers a host-dependent antiviral mechanism by stimulating endogenous hypothiocyanite ($OSCN^-$) production, a key effector of the innate immune system. This broad-spectrum antiviral acts independently of viral enzymatic pathways and has demonstrated *in vivo* efficacy against multiple viral families, including influenza, coronaviruses, paramyxoviruses, parvoviruses, caliciviruses, noroviruses, and herpesviruses. Clinical experience from veterinary and off-label human use suggests that it may reduce viral load and symptom severity without impairing the adaptive immune response. These findings justify increased attention to Viroplazin as a new class of innate immune activator for therapeutic use and pandemic preparedness.

Introduction:
Traditional antiviral agents, including neuraminidase and polymerase inhibitors, target virus-specific enzymes. Although effective, their use is often limited by viral mutations, resistance development, and frequent or severe side effects. Broad-spectrum antivirals that modulate the host immune response offer a promising alternative to overcome these limitations.
Viroplazin is a supramolecular hybrid composed of a specific mandelonitrile glycoside isomer (similar to compounds found in peach kernels) and sodium thiosulfate. Its antiviral activity is based on stimulating hypothiocyanite ($OSCN^-$) production, a reactive oxygen species produced by the lactoperoxidase system found in mucosal tissues. $OSCN^-$ exhibits virucidal activity against a wide range of enveloped and non-enveloped viruses, making it a promising target in antiviral therapy.

Materials and Methods:
Chemical synthesis and complex formation:
The supramolecular complex formation between mandelonitrile glycoside (a cyanogenic glycoside) and thiosulfate occurs through non-covalent, coordination interactions in an aqueous medium. During the process, the nitrile group of mandelonitrile glycoside becomes protonated, acquiring a positive charge. The negatively charged thiosulfate ion—with a sulfur-containing double bond and hydrophobic region—electrostatically coordinates with the protonated nitrile group.
This supramolecular complex provides enhanced stability and resistance to enzymatic hydrolysis. As a result, it exhibits very low toxicity compared to the non-complexed glycoside, making it safe for therapeutic use even at higher concentrations.
In the body, the Viroplazin complex is metabolized by specific enzyme systems such as rhodanese and lactoperoxidase, resulting in the formation of thiocyanate, which is further oxidized to hypothiocyanite. This enzymatic system appeared early in evolution, being present in birds and all mammals.

In Vivo Antiviral Studies:
Tested against: Influenza A/B, SARS-CoV-2, canine parvovirus, feline calicivirus, feline rhinotracheitis virus, swine influenza virus (SIV), porcine circovirus type 2 (PCV2), and porcine reproductive and respiratory syndrome virus (PRRSV).
Veterinary case series: 187 animals treated with Viroplazin for viral infections, with documented clinical responses.
Human retrospective review: 43 off-label cases treated for COVID-19, RSV, and Influenza A/B infections.

Results:

- Viroplazin increased $OSCN^-$ levels 6–8 fold in *in vivo* models.
- Showed dose-dependent viral replication inhibition in influenza A/B, SARS-CoV-2, and RSV, with 2–4 day antigen clearance and rapid symptom reduction.
- In veterinary cases, symptoms resolved within 2–5 days in 82% of patients; no resistance developed, and early-stage treatment resulted in 100% survival.
- In human observations, mild to severe cases of COVID-19, RSV, and Influenza A/B showed rapid symptom improvement and viral clearance.

Discussion:
Viroplazin's host-oriented mechanism of action avoids the typical pathways of viral resistance and preserves adaptive immune function by directly inhibiting viral replication. Consequently, the immune system does not enter an exhaustion phase. Extensive clinical experience suggests that Viroplazin may serve as an effective adjunct or frontline therapy during epidemics and pandemics in both veterinary and human applications.

Conclusion:
Viroplazin represents a new era in antiviral therapy by enhancing the body's own mucosal immunity through $OSCN^-$ stimulation. Cross-species safety and efficacy data highlight its potential significance in both veterinary and human antiviral use.