



Broad Antiviral Therapy with Membrane-Modifying Small Molecules

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SUMMARY

Researchers in UCLA's Department of Microbiology, Immunology and Molecular Genetics have discovered a compound for broad antiviral therapy.

BACKGROUND

Virus-borne diseases represent a significant proportion of infectious diseases worldwide. These diseases, including Hepatitis C and AIDS, affect millions of people, are often life-threatening, and have enormous economic impacts; the global market for Hepatitis C is estimated at ~\$4.5 billion and ~\$11 billion for HIV. Thus, drugs targeting a broad spectrum of viral types would have enormous market potential. However, almost all of the commercially available therapies are specific for particular viruses. The few "broad-spectrum" drugs, such as ribavirin, are effective only against a limited number of viral types. They also cause debilitating side effects, limiting the dosages to suboptimal levels. A "penicillin-like" antiviral therapy is essentially absent in the current marketplace, and few broad-spectrum antivirals are past the preclinical stage. Therapeutic approaches to treat a wide range of pathogenic viruses are therefore highly desirable

INNOVATION

UCLA researchers have discovered a compound for broad antiviral therapy. The compound modifies cellular membranes and disrupts virus-host integration, an essential step for viral entry. This mode of action is different from both commercially available antivirals and drugs in pharmaceutical pipelines, offering a plausible alternative development strategy. UCLA researchers have demonstrated the compound to be effective against eight viral types. Further, inhibitory effect was successfully demonstrated in vivo against HIV. Importantly, this molecule is an endogenously-produced antiviral factor. It is thus likely to be well-tolerated in the body.

APPLICATIONS

Topical broad-spectrum antiviral therapeutic for orofecal and sexually transmitted diseases.

ADVANTAGES

- ▶ Effective against a broad-spectrum of viruses.
 - ▶ HIV
 - ▶ Hepatitis C (HCV)
 - ▶ Herpes Simplex Virus (HSV)
 - ▶ Highly infectious viruses (ex: Ebola, Rift Valley fever viruses, etc.)
- ▶ Likely to be well-tolerated, since it is an endogenously produced molecule.

STATE OF DEVELOPMENT

- ▶ The antiviral effect has been demonstrated against eight viruses, namely, Ebola virus, HIV, hepatitis C virus, vesicular stomatitis virus, herpes simplex virus, murine gammaherpesvirus, Rift Valley fever virus, and Russian spring-summer encephalitis virus.
- ▶ The compound has been shown to reduce HIV replication in humanized mouse models.
- ▶ Derivative compounds with greater and more specific action are under development.

PATENT STATUS

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- ▶ Medical
 - ▶ Disease: Infectious Diseases
 - ▶ Therapeutics

RELATED CASES

2012-742-0

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,994,107	05/04/2021	2012-742

RELATED MATERIALS

► [Interferon-inducible cholesterol-25-hydroxylase broadly inhibits viral entry by production of 25-hydroxycholesterol.](#)

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [Receptor Interacting Protein 2 \(rip2\) in Development of Immune Response](#)

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