UNIVERSITY OF MINNESOTA
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Didehydro-nucleoside antiviral agents

A broad-spectrum antiviral agent platform

IP Status: PCT Pending

Applications

- Broad-spectrum antiviral agents
- Antiviral for West Nile virus and Zika virus

Key Benefits & Differentiators

- **Low toxicity:** 3'-deoxy-3',4'-didehydro-nucleoside-5'-triphosphates is naturally produced by the human body
- **Broad spectrum:** Exhibits strong antiviral effects against Zika virus and West Nile virus with the potential to treat dengue virus, hepatitis C virus and SARS-CoV-2.

Technology Overview

There is an urgent need for the continued development of potent and safe broad-spectrum antiviral agents as evidenced by the outbreak of coronavirus disease 2019 (SARS-CoV-2) and the emergence of additional viruses of pandemic concern. Pathogenic RNA viruses represent a particular challenge for global disease control due to their biological diversity and rapid adaptive rates which have proved to be difficult to anticipate and overcome. Also, the anthropogenic change of natural ecosystems and continuous population growth are driving increased rates of interchange of pathogens that can develop into global pandemics.

Researchers at the University of Minnesota have developed new scaffolds for broad-spectrum antiviral agents. 3′-deoxy-3′,4′-didehydro-nucleosides (ddh-nucleosides) containing all native nucleobases, as well as corresponding phosphoramidate prodrugs, were synthesized to test for activity in controlling West Nile virus and Zika virus. Multiple promising candidates emerged including ddhG prodrug (ddhGPD) which reduced Zika virus titer by 4.0 log and no toxicity at the tested concentrations, as well as ddhUPD which reduced West Nile virus titer by 3 log at a 0.1 mM concentration with no toxicity using a neutral red cell viability assay. Collectively, 3′-deoxy-3′,4′-didehydro nucleosides are promising compounds for further development into broad-spectrum antiviral agents.

Phase of Development

TRL: 3-4
Pre-clinical optimization: demonstrated potency versus West Nile virus and Zika as well as toxicity testing.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Technology ID

2023-032

Category

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Researchers

- **Daniel A. Harki, PhD** Professor, Department of Medicinal Chemistry

References

1. Samantha A. Kennelly, Jacob M. Sawyer, Anne F. Payne, Alexander T. Ciota, Daniel A. Harki(2024) , https://pubs.acs.org/doi/10.1021/acsmedchemlett.4c00225, ACS Medicinal Chemistry Letters, 15, 1334–1339