Clemson University Research Foundation

HIV Inhibitors to Prevent Spread of Virus in Patients (2010-001)

HIV Inhibitor Targets RNA in the Replication Cycle to Prevent Virus from Spreading

Market Overview

This inhibitor comprises a new strategy for mitigating the growth and spread of HIV. According to the World Health Organization, over 36 million people are living with HIV around the world. Consequently, the global HIV therapeutics market is estimated to reach a value of $15.3 billion by 2023. Most HIV inhibitors currently available are nucleoside or reverse transcriptase inhibitors. Increased resistance to these drugs calls for new approaches to HIV suppression, therefore non-nucleoside HIV inhibitors are in demand. Clemson University researchers have developed a new HIV inhibitor featuring two compounds that bind with viral RNA to suppress its ability to replicate. Because these two compounds work together to block virus replication at two separate points in the RNA strand, single point mutations cannot develop. This drastically reduces the occurrence of mutated RNA strands that may become drug-resistant. This inhibitor will be more effective and less risky than current treatments. Patients with HIV can expect suppression of the virus with low potential for eventual resistance.

Application

HIV treatment

Stage of Development

Concept

Advantages

- Blocks replication of virus at two points, preventing mutations from developing
- Decreases chance of mutation to a drug-resistant strain, effectively suppressing the virus
- Targets RNA within the replication cycle, providing more effective treatment than current therapies

Technical Summary

Clemson University researchers have developed RNA-targeted ligands that disrupt RNA-protein interactions critical for HIV replication, thus inhibiting HIV growth. The new strategy for RNA-targeted therapeutics would prevent virus proliferation. The innovative compounds, neomycin dimers and benzimidazole-neomycin conjugates, show significant inhibition of HIV and bind to crucial RNA structures responsible for virus replication. By targeting RNA at multiple points during the replication cycle, further spread of the virus can be prevented with a very low chance of developing drug resistance.

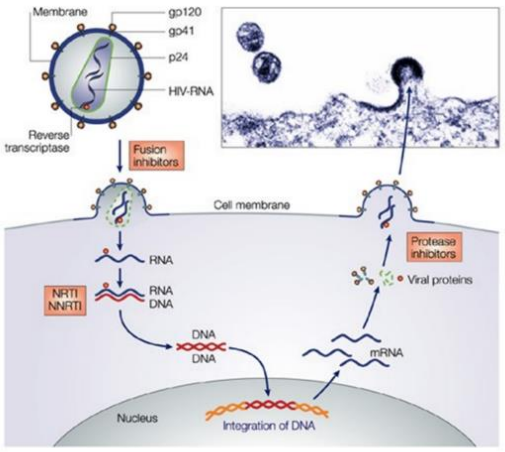

Figure 1: HIV Replication Cycle

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App Type	Country	Serial No.	Patent No.	CURF Ref. Number	Inventors
Utility Divisional	United States	12/857,425 14/703,549	9,072,761 9,492,554	2010-001	Dr. Dev Arya

About the Inventors

Dr. Dev Arya is a Professor of Bio-Organic and Medicinal Chemistry at Clemson University. He earned his Ph.D. in Bioorganic Chemistry from Northeastern University, Boston. Prior to joining Clemson, he completed postdoctoral studies at UC Santa Barbara. He is the recipient of the National Science Foundation CAREER Award and ACS Horace S. Isbell Award of the Division of Carbohydrate Chemistry. Dr. Arya has one issued patent and another in prosecution. His research interests focus on the understanding, design, and discovery of new motifs for the molecular recognition of biological macromolecules.

For More Information

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