

A Novel strategy to Inhibit Replication of RNA Viruses

Background

Pathogenic viruses that contain RNA as their genetic material use viral genome encoded reverse transcriptase enzyme to convert RNA to DNA prior to integration into the host genome. The reverse transcription of viral genome occurs via a multi-step process, and several antiviral agents that target reverse transcriptase enzyme have been developed and are widely used in treating AIDS patients. The reverse transcriptase inhibitors currently in clinical use include nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and nucleotide inhibitors. These inhibitors differ in their mode of action but all target the polymerase activity of the enzyme.

However, HIV reverse transcriptase mutates rapidly and drug resistant variants emerge quickly rendering the drug regimen therapeutically ineffective in reducing the viral load in HIV patients. Thus, a treatment strategy that targets the HIV replication cycle components that do not mutate readily would prove to be a viable alternative.

The current technology relates to a novel treatment strategy that can be generally applied to all RNA viruses that depend on the reverse transcriptase enzyme for replication and survival.

Description of the Technology

A novel strategy for inhibiting the reverse transcriptase enzyme that overcomes the challenge of viral resistance is described. Antiviral agents that inhibit reverse transcriptase enzyme and methods for using these agents to effectively inhibit viral replication have been tested. An assay that can be adapted to high throughput formats for screening antiviral agents has been developed. Kits for assaying antiviral activity of agents that inhibit reverse transcriptase can be developed using the methods described.

Advantages

The rapid rate of mutation in the viral genome encoded components required for propagation limits the therapeutic efficacy of antiviral agents currently in clinical use. Thus, patients on antiretroviral therapy quickly become refractory to treatment with antiviral agents. The novel approach described herein has the potential to circumvent this problem because it targets the components of replication process that are not prone to high mutation frequencies.

Applications

- . • The antiviral agents can be used to treat HIV infected patients
- . • The antiviral agents can be used to inhibit the replication of any RNA containing virus that uses reverse transcriptase
- . • To develop high throughput screening assays for antiviral agents
- . • To develop kits for screening antiviral agents.

Patent Status

File CINJ 01-06/Pilch

- . •US patent application filed.
- . •Application published on 04/10/2003 (Publication No.: US-2003-0069194-A1)

Licensing Opportunity

- This technology is available for exclusive license.

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File CINJ 01-06/Pilch