NATIONAL CANCER INSTITUTE
Technology Transfer Center

Griffithsin-Based Anti-viral Therapeutics with Improved Stability and Solubility

Summary

Scientists at the National Cancer Institute's Molecular Targets Laboratory have modified the Cnidarin-derived griffithsin compound to have greater storage time and stability. Griffithsin compounds are a class of highly potent proteins capable of blocking the HIV virus from penetrating T cells. The National Cancer Institute seeks parties interested in collaborative research to license or co-develop large-scale recombinant production of the compound.

NIH Reference Number

E-065-2015

Product Type

- Therapeutics

Keywords

- cnidarin, anti-viral, HIV, Griffithsin, HCV, Sars, HSV

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Griffithsin is a potent anti-viral protein with activity against HIV, HCV, Sars, HSV 1 & 2 and other viruses. It is active against HIV and HCV at picomolar concentrations. Griffithsin is moving into clinical trials as an anti-HIV microbicide. Based on the structure of griffithsin and the necessities of pharmaceutical product development and regulatory approval, certain mutations in the sequence of griffithsin have been generated which could add to the stability and solubility of the protein. These mutants have all been tested for biological activity, solubility and thermal stability. They possess modified physiological attributes that would be advantageous for subsequent development for both systemic and topical administration.

Scientists in NCI's Molecular Targets Laboratory and collaborators modified the griffithsins

to have a mutation position #77 (Met), which eliminates the possibility of Methionine oxidation at this solvent-exposed position, preventing oxidation and increasing the usable shelf-life of griffithsin formulations. Additional mutations include changes in the isoelectric point of the protein, which alter its solubility in various pH ranges allowing for improved product release in alternately formulated products.

The modified griffithsins will be used to provide an active pharmaceutical ingredient with improved properties including reduced oxidation, improved solubility and bioavailability over a range of pH values and thermal stability.

Potential Commercial Applications

- Microbicide, Therapeutic, Research tool

Competitive Advantages

- Increased stability: The modified griffithsins has greater shelf-life due to reduced oxidation and improved solubility;
- Increased bioavailability due to other mutations including those that change the isoelectric point.

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Patent Filed:** U.S. Patent Application Number PCT/US2016/17267, Filed 18 Aug 2016

Therapeutic Area

- Infectious Diseases

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