

2ND GENERATION GRIFFITHSIN MUTANTS FOR IMPROVED STABILITY AND SOLUBILITY

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Technology description

The Griffithsin mutants discovered have numerous benefits, as they are able to inhibit a wide variety of viruses in different hosts. These 2nd generation mutants allowed for the development of an improved active pharmaceutical ingredient for microbicide and antiviral applications. The modifications allowed for a Griffithsin mutant that has reduced methionine oxidation, increased shelf-life, improved solubility, and improved bioavailability at different pH ranges. Griffithsin mutants maintain antiviral activity with improved biophysical characteristics and can be given to patients who are at risk for exposure to a virus or have been newly exposed to a virus. Additionally, the Griffithsin mutant can be a component of an antiviral agent that can be given to patients topically, orally, transdermally or through aerosol formulations. There is a great need for the development of an anti-viral component that can be applied to a variety of viruses and benefit several hosts.

Griffithsin is a potent anti-viral protein with activity against HIV and other viruses, including hepatitis, herpes, Japanese encephalitis virus, and SARS-CoV. Researchers in this group identified oxidation sensitivity of the 1st generation Griffithsin and suggested modification of methionine (M78).

Researchers next designed an improved 2nd generation of mutants with an amino acid substitution at M78. This modification allows the prevention of protein oxidation and increases the useable shelf-life of Griffithsin. With the identification of this mutant polypeptide sequence, widespread application is possible, because delivery to oxidative biologic compartments can be achieved with no impact on the protein structure. The Griffithsin mutants are currently expressed and purified from transient plant expression systems using plant expression vectors. Griffithsin mutants maintain antiviral activity and can then be administered to the host, either prophylactically or therapeutically, in order to inhibit viral infection. Additionally, the composition can further comprise other active pharmaceutical agents, such as immunomodulators and antibiotics to target or expand antiviral activity.

Advantages

Potent anti-viral protein with activity against HIV and other viruses

Possesses microbicidal capabilities

Expressed in plants

Composition can provide anti-viral capabilities for a wide variety of hosts

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