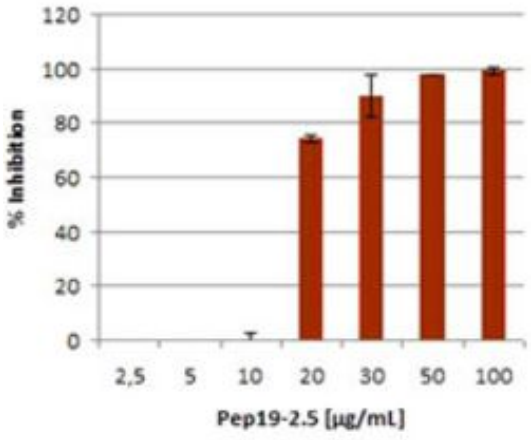
Technology Offer

SALP peptides are potent broad-spectrum anti-viral agents

Reference Number 14-00020b

Challenge

Viral infections are a major threat for human health. For example, an estimated 2 million people are living with HIV, the retrovirus causing AIDS, and 2.9 million people died of AIDS-related illnesses in 2006 (source: WHO). The majority of currently available anti-retroviral drugs are targeting a specific viral enzyme or molecule, and thus possess only a narrow spectrum of activity. In the light of an increasing number of multiple viral infections and the occurrence of novel viral strains, being resistant to established anti-viral treatment, there is a pressing need for the development of anti-viral agents that are active against a broad-spectrum of human pathogenic viruses.



Inhibition of viral multiplication was tested in vitro using human reporter cell lines.

Technology

This medical need is met by synthetic anti-microbial and LPS-neutralizing peptides (SALPs), which efficiently inhibit infections of a broad variety of viruses. So far, the potent inhibition of infections caused by HIV1, HSV1, HSV2, HBV, HCV and Influenza virus has been demonstrated. Based on the insight of comprehensive biophysical studies of natural occurring anti-microbial proteins, SALPs were originally developed to neutralize lipopolysaccharides (LPS) of the outer membrane of Gram-negative bacteria. However, as it turned out, SALPs are also potent antiviral compounds, binding to heparan sulfate moieties on the surface of the host cell, which serve as docking molecules for a variety of enveloped viruses. Accordingly, SALPs prevent the attachment of viruses to host cells and act as a new, potent class of anti-viral agents.

Commercial Opportunity

The new SALPs are offered for in-licensing or co-development.

Development Status

Toxicity of new SALPs was tested *in vitro* using a variety of human cell lines. GLP-compliant *in vivo* tests are ongoing. So far, no toxicity has been observed in therapeutically relevant concentrations. Anti-viral activity was determined *in vitro*: human reporter cell lines were pre-incubated with SALPs and infected with virus isolates. Even at low concentrations, SALPs facilitated a total inhibition of viral multiplication. For influenza, anti-viral activity was also validated *in vivo*.
Apart from their potency as anti-viral compounds, SALPs are currently being developed for the prevention and treatment of sepsis. In ths connext, LPS-neutralizing activity was demostrated both *in vitro* and *in vivo*. The results from two different murine models for endotoxic shock clearly proved that SALPs efficiently neutralize LPS *in vivo*.

Patent Situation

A priority establishing European patent application was filed in 2008. In the extended European search report, novelty and inventive step have been acknowledged. In 2010, European, US and Japanese patent applications have been filed.

Further Reading

- Krepstakies M *et al.*, A new class of synthetic peptide inhibitors blocks attachment and entry of human pathogenic viruses. J. Infect. Diseases 2012;205:1654–64.
- Gutsmann T *et al.*, New antiseptic peptides to protect against endotoxin-mediated shock. Antimicrob Agents Chemother. 2010 Sep;54(9):3817-24.
- Kowalski I *et al.*, Physicochemical and biological characterization of anti-endotoxin peptides and their influence on lipid properties. Protein Pept Lett. 2010;17(11):1328-33.

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