ascenion Technology transfer for academic research
A company of the LifeScience Foundation

REFERENCE NUMBER
TO 10-00128

Functionalized Nanoparticles for Viral Clearance

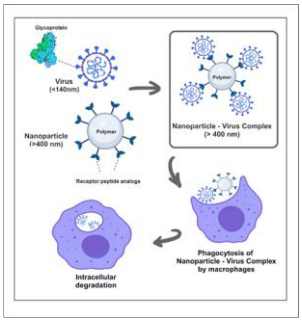
Keywords: nanoparticles, viral clearance, phagocytosis, virus-binding peptides, high-affinity binding, antiviral therapy, diagnostic kits

INVENTION NOVELTY

This invention introduces a novel approach for the prevention and treatment of viral infections using functionalized nano- or microparticles. These particles are equipped with virus-binding peptides or small molecules that bind to target viruses with high affinity. By forming aggregates with the viruses, these nanoparticles facilitate the clearance of viral particles through phagocytosis by immune cells such as macrophages. This mechanism provides an innovative and effective means of viral neutralization and removal.

VALUE PROPOSITION

Traditional antiviral treatments often face limitations such as viral resistance and side effects. This new technology addresses these challenges by leveraging the body's natural immune mechanisms to clear viruses. The functionalized nanoparticles bind to viruses with high specificity and affinity, forming aggregates that are easily phagocytosed. This process enhances the immune response, leading to more efficient viral clearance. The technology offers a potent, versatile, and scalable solution for a wide range of viral infections, including emerging and re-emerging viruses.



Mode of action of functionalized nanoparticles

TECHNOLOGY DESCRIPTION

The functionalized nanoparticles are designed to bind target viruses with nano- to picomolar affinity. These nanoparticles, which have an overall diameter of 400 to 2000 nm, are substantially spherical in shape to optimize their phagocytosis. The virus-binding peptides or small molecules on the surface of the nanoparticles include a variety of high-affinity binders known for their ability to specifically target viral particles. Once bound, the nanoparticles form aggregates with the viruses, significantly increasing their size and facilitating their uptake and destruction by macrophages.

COMMERCIAL OPPORTUNITY

The commercial potential of this technology spans multiple sectors. In the pharmaceutical industry, it offers the development of new antiviral therapies that use these nanoparticles to treat infections by various viruses, including HIV, SARS-CoV-2, and influenza. In diagnostic applications, it enables the creation of kits that detect viral presence in biological samples by observing aggregate formation. Additionally, there are significant opportunities for biotechnology companies to license this technology for the development of new antiviral drugs and therapeutic strategies.

DEVELOPMENT STATUS

The method has shown significant efficacy in preclinical studies, where it has demonstrated the ability to bind and neutralize viral particles effectively. Current research efforts are focused on optimizing the production process, scaling up the synthesis of the functionalized nanoparticles, and conducting in vivo studies to further validate the therapeutic potential. The next steps in development include refining the technology for specific viral targets and creating standardized kits for diagnostic and therapeutic applications.

PATENT SITUATION

The international PCT-application PCT/EP2024/082187 was filed in November 2024 based on EP23209601.6.

LEIBNIZ HKI

Ascenion GmbH
Herzogstraße 64
D-80803 München
info@ascenion.de
www.ascenion.de

Licensing Contact
Dr. Sabina Heim
Senior Technology Manager
T: +49 531 6181-2090
heim@ascenion.de

Last updated July 2020