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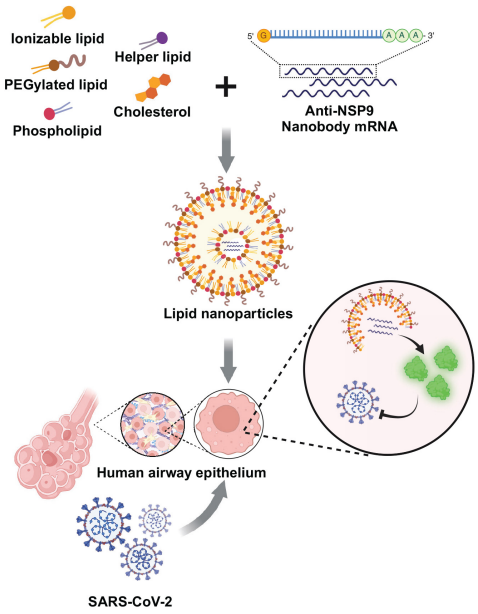
جامعة نيويورك أبوظبي
NYU ABU DHABI

RESEARCH MARKETING SUMMARY

Nanobody-Based Inhibition of SARS-CoV-2 replication

High specificity of nanobodies reduces off-target effects



SUMMARY

Coronaviruses are enveloped viruses with positive-sense single-stranded RNA genomes. The novel Coronavirus SARS-CoV-2, causing the COVID-19 pandemic, has a genome encoding 29 proteins, including non-structural proteins (NSPs) vital for replication. The RNA-dependent RNA polymerase (RdRp or NSP12) is essential, forming a complex with NSP7, NSP8, and NSP9. Targeting NSP9 could block viral replication and manage COVID-19 effectively as well as other coronaviruses outbreaks.

Scientists at New York University Abu Dhabi have developed compositions with significant potential to control the emergence of new viral variants that may evade existing vaccines. By targeting essential viral replication proteins, these tools offer a promising approach to manage viral spread in large human populations.

VALUE PROPOSITION

Effectiveness
Targeting multiple essential proteins in the virus directly inhibits the replication and transcription process of SARS-CoV-2, offering a potent therapeutic strategy against COVID-19 and other coronaviruses.

Versatility
The composition's unique mode of action allows for potential use in both prophylactic and therapeutic contexts, making it versatile in various stages of infection and across different patient demographics.

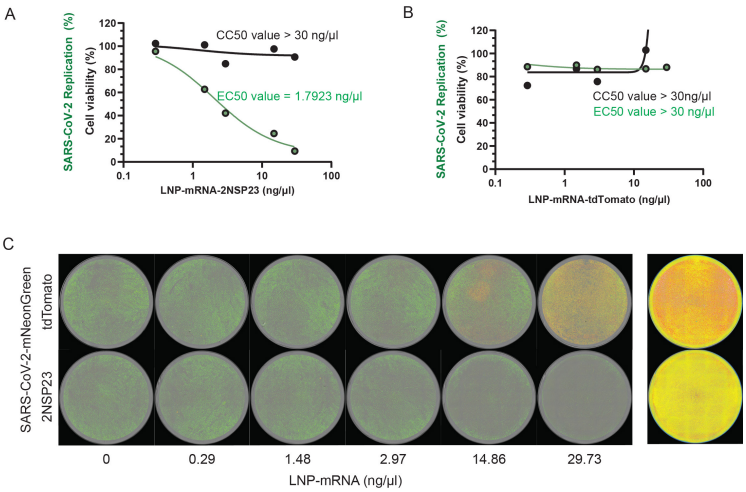
Standardization
The use of homogeneous lipid nanoparticles (LNPs) for delivering nucleic acids encoding the nanobodies improves the overall effectiveness of a treatment.

Synergistic Potential
Can be used in combination with existing treatments and vaccines to enhance overall therapeutic effectiveness and broaden the arsenal against current and future coronavirus outbreaks.

Nanobody-Based Inhibition of SARS-CoV-2 replication

APPLICATIONS AND USES

Nanobodies are single-chain antibodies produced in camelids. Due to their molecular size and versatility, they have a big impact in biotechnology and they are very efficient in the treatment of pathological conditions. There is increased worldwide support for nanobody research and development in the drug discovery industry and some nanobody-based drugs have already been approved for medical treatment. This invention, targets SARS-CoV-2 proteins and inhibits viral replication. Therefore, it has significant potential in the fields of medical research, particularly for medical facilities at the forefront of a potential pandemic.



Inhibition of SARS-CoV-2 replication by LNP-mRNA-2NSP23
(A) Experimental pipeline for testing the LNP-mRNA effect on SARS-CoV-2 replication. (B) Vero E6 cells treated with serial dilution of LNP-mRNA-2NSP23 were infected with SARS-CoV-2-mNeonGreen and cell viability were quantified. (C) Vero E6 cells treated with serial dilution of LNP-mRNA-tdTomato were infected with SARS-CoV-2-mNeonGreen, and cell viability were quantified.

It is ideally suited for:

- ➔ Fundamental and Clinical Epidemiology.
- ➔ Prophylaxis.
- ➔ Immunotherapy and Combination Therapies.
- ➔ Drug Discovery.
- ➔ Pandemic Preparedness.
- ➔ Livestock Pandemics

ENGAGEMENT OPPORTUNITIES

We are offering opportunities for joint ventures, collaborative pilot studies and licensing with industry partners to further develop and commercialize this technology.

CONTACT DETAILS FOR ENQUIRIES

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Intellectual Property
Patent Number: WO2023041985A2
New York University in Abu Dhabi Corp.

Proof of Concept
https://pubmed.ncbi.nlm.nih.gov/39281707/