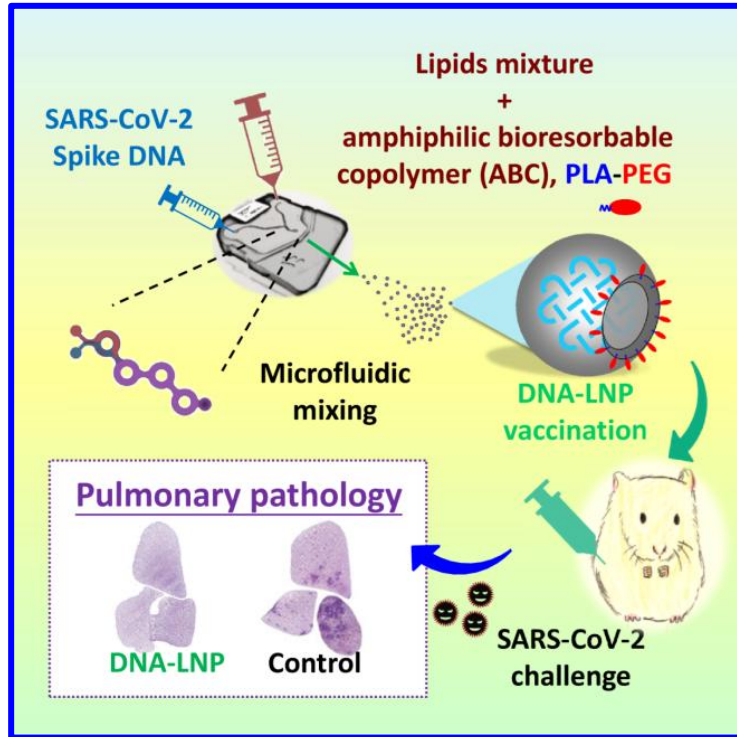


Surface engineering of lipid nanoparticle (LNP) in the pursuit of innovative nucleic acid-based vaccines and therapeutics



Significance

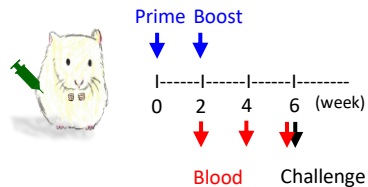
1. Set up LNP synthesis procedure
 - Journal of Medical Virology, 2023;
 - Molecular Therapy - Methods and Clinical Development, 2024
2. Introduce new concept LNP components
 - Molecular Therapy - Nucleic Acids, 2024;
 - Taiwan patent TW I853485; US and AU patent application
3. Incubate the service platform,
"Nucleic Acid Drugs & Raw Materials"

Ming-Hsi Huang, Shih-Jen Liu,
Hsin-Wei Chen, Ching-Len Liao

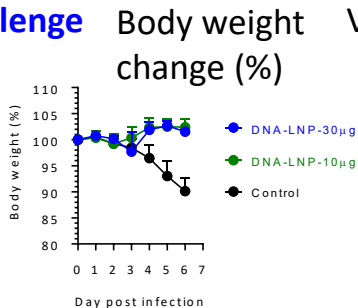
National Institute of Infectious Diseases and Vaccinology
National Health Research Institutes, Taiwan

LNP platform technology in COVID-19 DNA vaccine

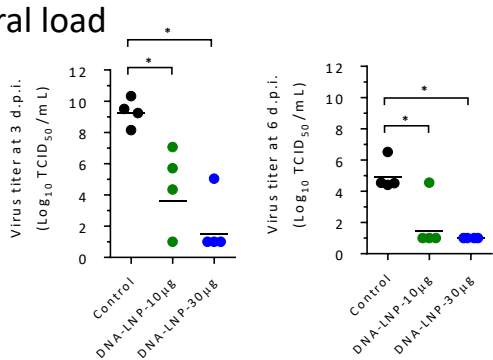
DNA encoding SARS-CoV-2
Omicron variant spike genes



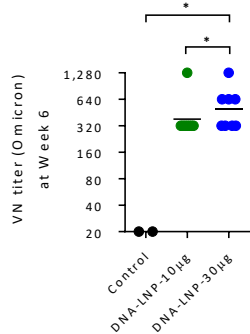
Virus
challenge



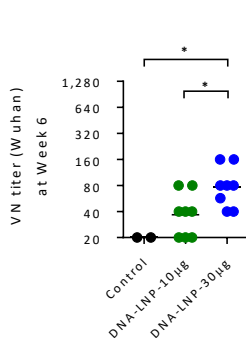
Viral load



Anti-Omicron



Anti-Wuhan



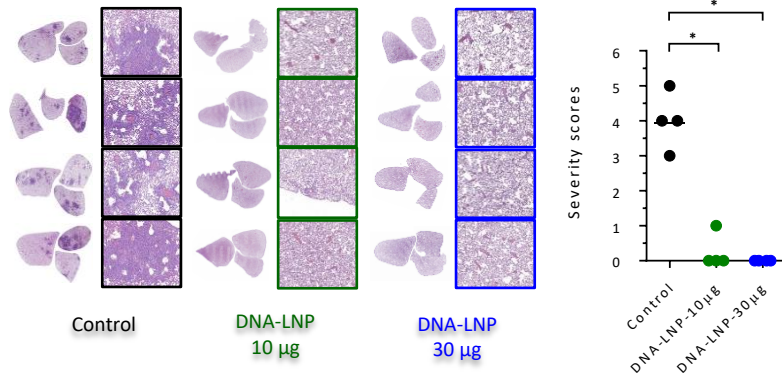
Molecular Therapy
Nucleic Acids
Original Article

Molecular Therapy - Nucleic Acids.
2024;35(3):102261.

Boosting DNA vaccine power by lipid nanoparticles surface engineered with amphiphilic bioresorbable copolymer

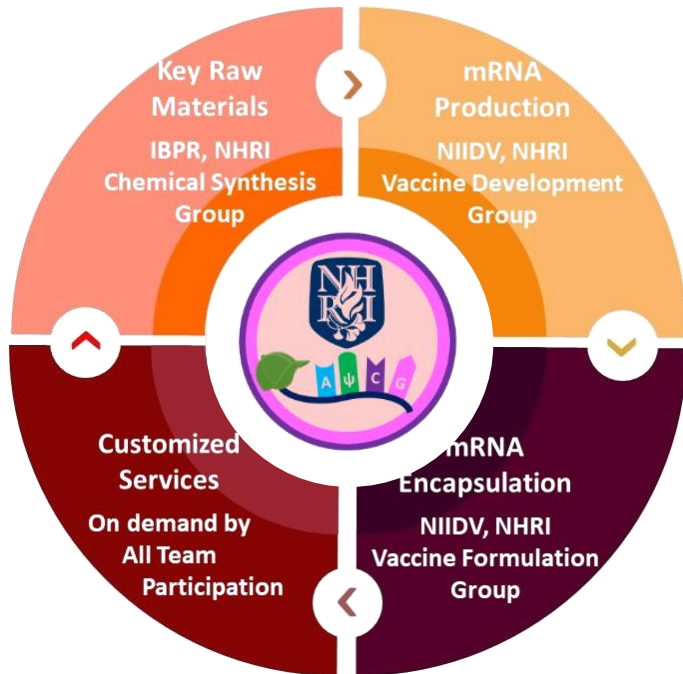
Pathologic examination: H&E

Pathologic score



Nucleic Acid Drugs & Raw Materials Service Platform

National Core Facility for Biopharmaceuticals (NCFB)



Mission Statement

To accelerate academic research, and further contribute positively to domestic companies that want to invest in the nucleic acid drugs, thereby helping to construct an industry chain in Taiwan.

To provide critical raw materials and mRNA synthesis service platforms in lab scale and potential GMP-grade production :

- (1) Key raw materials : Dr. Jinq-Chyi Lee (李靜琪), IBPR
Capping molecule & pseudo-uridine (m¹ΨTP)
- (2) mRNA production : Dr. Shih-Jen Liu (劉士任), NIIDV
in vitro-transcribed (IVT) mRNA synthesized
by T7 RNA polymerase-mediated transcription
- (3) mRNA encapsulation : Dr. Ming-Hsi Huang(黃明熙), NIIDV
mRNA-LNP self-assemblies using microfluidic mixer system
- (4) Customized services : Dr. Chih-Hsiang Leng (冷治湘), NIIDV
On demand by all team participation

