Advanced Vaccine Technology: Lipid Nanoparticle Adjuvants

Tech ID: 34021 / UC Case 2024-9AZ-0

BRIEF DESCRIPTION

This technology represents a pioneering approach to vaccine development, focusing on encapsulated adjuvants and antigens to enhance efficacy while minimizing side effects.

FULL DESCRIPTION

The technology encompasses the use of lipid nanoparticles (LNPs) to encapsulate adjuvants with protein antigens or corresponding mRNAs, targeting a broad spectrum of pathogens with a single vaccine formulation. This method stems from over three decades of gene therapy research, leveraging liposomes for DNA transfection, akin to viral infection processes. The success of mRNA vaccines against COVID-19 highlights the potential of this technology to revolutionize vaccine development, addressing the need for rapid deployment, high efficacy, and reduced reactogenicity.

SUGGESTED USES

- Public health emergency response to pandemics and emerging infectious diseases.
- Development of safer, more effective vaccines for a variety of pathogens.
- Pharmaceutical and biotechnology companies focusing on vaccine R&D.
- Global vaccination campaigns, particularly in resource-poor settings.

ADVANTAGES

- Enables rapid development and scaling of vaccines against emerging pathogens.
- Minimizes inflammatory side effects and systemic toxicity associated with traditional adjuvants.
- Supports the development of more efficacious vaccines with fewer side effects.
- Facilitates a targeted immune response, enhancing both the adaptive and innate immune systems.
- Offers a versatile platform for developing vaccines against a wide range of viruses, bacteria, and parasites.

PATENT STATUS

Patent Pending

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Disease: Infectious Diseases
  - Gene Therapy
  - Vaccines

RELATED CASES

2024-9AZ-0

» Holubowicz, R., et al. Felgner, J., Felgner, P. L. (2025). Safer and efficient base editing and prime editing via ribonucleoproteins delivered through optimized lipid-nanoparticle formulations. Nat. Biomed Eng. 9 (1).

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