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Injectable Hydrogel Used for Sustained Delivery of Vaccine

Tech ID: 33683 / UC Case 2024-934-0

BRIEF DESCRIPTION

This technology introduces a novel vaccine delivery system using thermosensitive hydrogels for sustained antigen release, aiming to improve immune response durability and breadth.

FULL DESCRIPTION

Researchers at UC Irvine have developed a thermosensitive hydrogel combined with nanoparticle-conjugated antigens and adjuvants to create a depot for slow vaccine release. Upon injection at room temperature, the hydrogel gels at body temperature, allowing for a controlled release of the vaccine, which is shown to enhance dendritic cell activation, antigen presentation, and overall immune response.

SUGGESTED USES

- » Vaccines for infectious diseases, particularly those with high mutation rates such as influenza and SARS-CoV-2.
- » Immunotherapy for chronic diseases that can benefit from sustained immune activation.
- » Research tools for studying immune response kinetics and mechanisms.

ADVANTAGES

- » Enhanced immune response compared to conventional vaccine delivery methods.
- » Long-lasting delivery up to 8 weeks, reducing the need for multiple booster shots.
- » Optimal size (approximately 30 nm in diameter) for dendritic cell uptake.
- » More balanced IgG1/IgG2c ratio indicating a balanced Th1/Th2 response.
- » Modular design adaptable to various pathogens, including those prone to antigenic drift like influenza and SARS-CoV-2.

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OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
- » Delivery Systems
- » Vaccines

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