

Therapeutic – Vaccine Platform

Simple Immune Targeted Vaccine Platform

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Problem

Current vaccine development is inherently complex and risky, driven by multi-component formulations that require antigen drug substance production, adjuvant identification, formulation optimization, and extensive fill-finish, quality control, and cold-chain logistics. This complexity results in high and unpredictable cost of goods (COGS), fragile supply chains, and long development timelines. Conventional protein subunit vaccines often rely on adjuvants to achieve sufficient immunogenicity, further increasing manufacturing and regulatory risk. Collectively, these factors limit scalability, slow response to emerging pathogens, and constrain global access to effective vaccines.

Solution

The Humanized Immunotargeted monoclonal antibody (HITmAb) platform (Fig. 1) addresses these challenges by simplifying vaccine design and delivery. HITmAb vaccines eliminate the need for adjuvants, are administered in saline, and leverage established monoclonal antibody manufacturing processes to deliver antigens directly to antigen-presenting cells. By reducing formulation complexity and supply-chain dependencies, HITmAb enables rapid development of lower-cost vaccines with predictable COGS, while maintaining robust immunogenicity and scalability.

Description of the Invention

HITmAb is a humanized anti-HLA-DR monoclonal antibody (44H10) engineered as a modular vaccine delivery platform. Multiple antigens and T-cell epitopes can be incorporated into a single construct with defined valency, enabling mono- or multi-valent vaccine designs. The antibody binds HLA-DR in a 1:1 manner with nanomolar affinity and exhibits strong biophysical stability across time and temperature.

Preclinical studies demonstrate that HITmAb vaccines elicit robust, multi-specific antibody and memory B-cell responses without adjuvants (Fig. 2), even when using poorly immunogenic antigens such as recombinant SARS-CoV-2 RBD. Mono- and bi-valent HITmAb candidates generate strong neutralizing antibody responses against wild-type SARS-CoV-1 and SARS-CoV-2 and retain neutralization against variants of concern, including Omicron BA.1 and BA.5.

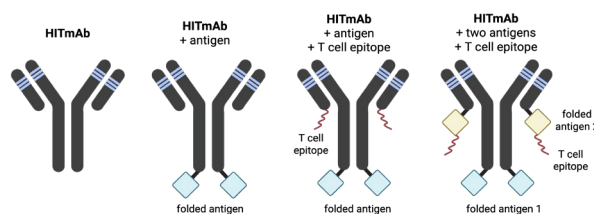


Fig. 1. Modular Architecture of HITmAb enabling fusion of diverse antigens and peptides

Keywords monoclonal antibody, vaccine, multivalent vaccine, adjuvant free, low-complexity manufacturing

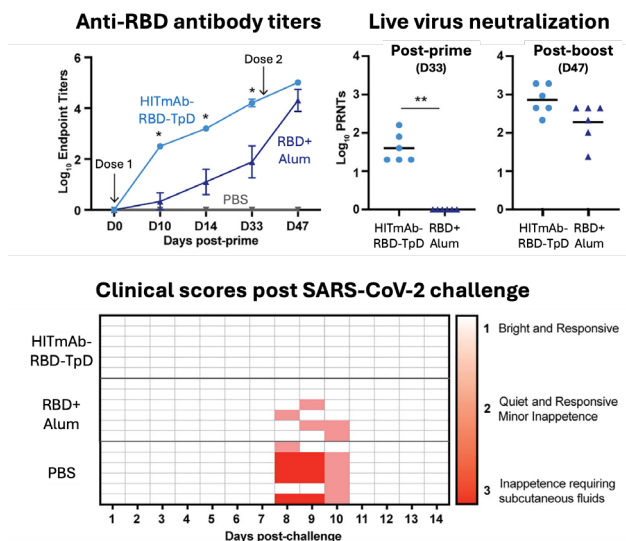


Fig. 2. Efficacy of HITmAb fused to the SARS-CoV-2 spike protein RBD and the T cell epitope TpD as a vaccine candidate in a pre-clinical ferret infection model of COVID-19. The HITmAb-RBD-TpD construct elicits robust antigen-specific antibody responses that neutralize live SARS-CoV-2 virus both before (D33) and after (D47) boosting, and protect immunized rabbits from clinical COVID-19, surpassing responses elicited by RBD adjuvanted in Alum.

Publications & Patents

Patents pending in Canada (CA [3250551](#)) and the US (US [18/863143](#)).

Kassardjian et al., *Antibodies* 13, 57 (2024). DOI: [10.3390/antib13030057](#)

Kassardjian et al., *Cell Reports* 42, 112391 (2023). DOI: [10.1016/j.celrep.2023.112391](#)

Seeking strategic partnership/licensing to develop immunotargeted vaccine products

Key Advantages

- Adjuvant-free vaccination: Antigens are precisely delivered to antigen-presenting cells via HLA-DR targeting, eliminating adjuvant requirements.
- Modular, multi-valent design: Multiple antigens and epitopes can be combined in a single vaccine to address viral diversity and immune escape.
- Reduced manufacturing and supply-chain risk: Leverages mature, large-scale monoclonal antibody manufacturing with low complexity and predictable yields.
- Favorable stability profile: High thermostability minimizes cold-chain dependence and improves yield and distribution efficiency.
- Low anticipated COGS: Extremely low milligram-per-dose requirements (anticipated ~0.5 mg) translate to orders-of-magnitude lower material cost per dose compared to passive therapeutic antibodies (Table 1).
- Comparable efficacy with faster timelines: Preclinical neutralization is comparable to protein subunit vaccines, with expected clinical efficacy and accelerated time to clinic driven by platform simplicity.

Table 1: Anticipated HITmAb COGS compatible with low-cost vaccine production.

	HITmAb	Beyfortus
Drug Class	Vaccine	RSV – therapeutic mAb
Administration	IM/SC	IM
mg/dose	0.5 mg*	50-100 mg
Doses/kg mAb	2 M	10 K-20 K
\$/dose (\$100/g mAb)	\$0.05	\$5 - \$10

*anticipated human dose

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