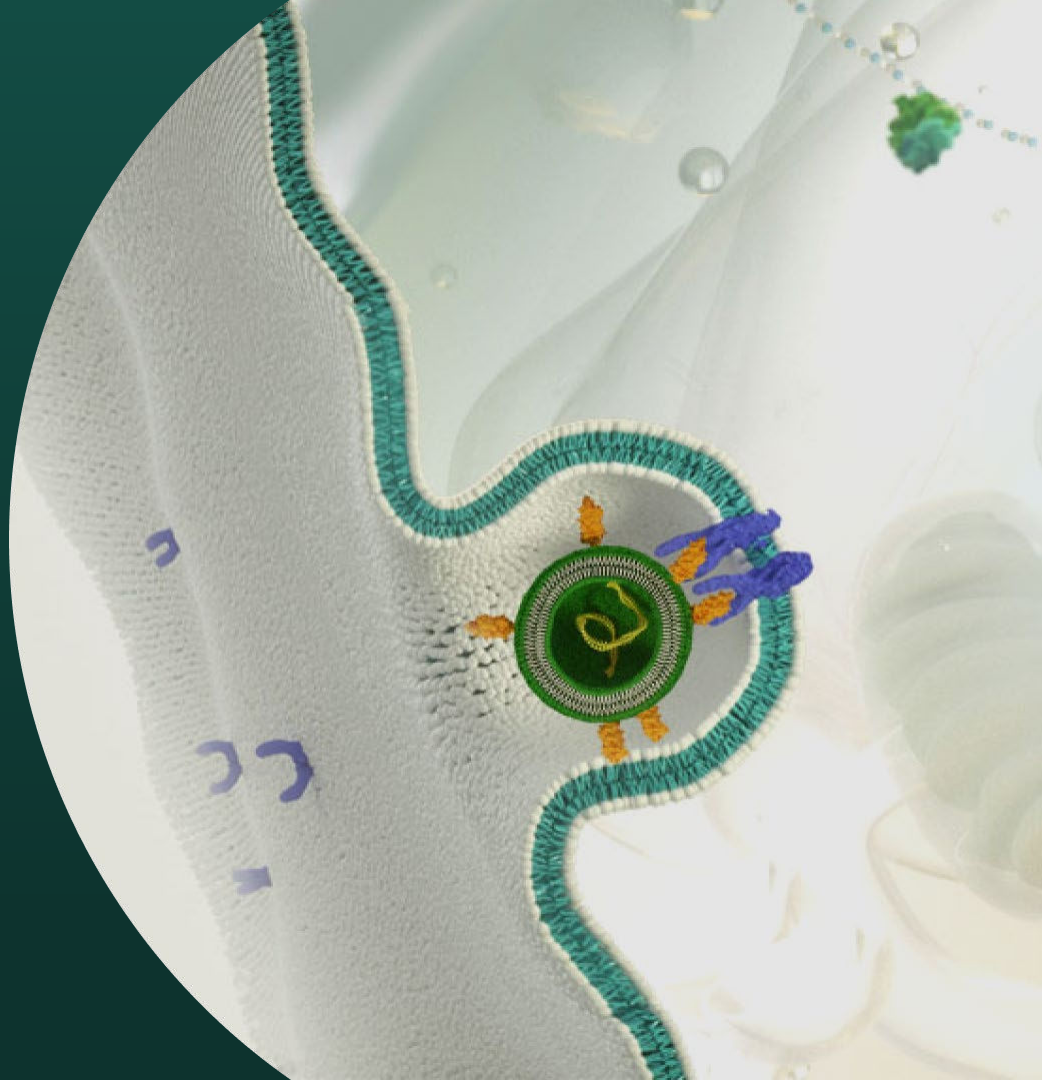


Next-Generation LNP: Advancing mRNA Vaccine Performance

Ghania Chikh, PhD.
WVC Europe, October 20th 2026

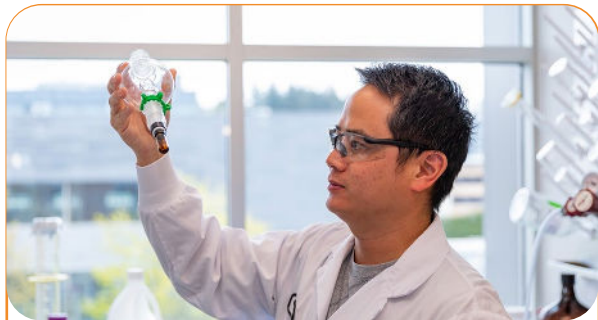


Presentation Outlines

- Introduction to Acuitas Therapeutics LNP technology
- Next generation LNP technology for infectious disease vaccine
- LNP technology for cancer vaccine
- Preformed Vesicle (PFV)

Acuitas Therapeutics LNP Technology

Overview



WHO WE ARE

Acuitas is a globally recognized biotechnology company specializing in the **development of delivery systems for nucleic acid therapeutics based on lipid nanoparticles (LNP)**.

Our LNP has enabled **three world firsts**: Onpattro®, Comirnaty®, and the first personalized CRISPR gene therapy.



WHO WE WORK WITH

- Cutting edge **pharmaceutical & biotechnology** companies
- Leading **academics in universities & institutes**
- **Foundations & NGOs**



HOW WE WORK

As a technology platform provider, we exclusively work in collaboration with partners.

We do not have our own drug development programs – **we are focused on supporting our partners to bring their drug products to patients.**

Our Partners' Success

Products in Clinic



21 in Phase 1



4 in Phase 2



2 in Phase 3

Clinical Firsts



First Clinically
Approved
**RNA
interference-
based
Medicine**



First Clinically
Approved **mRNA
Vaccine**



First **LNP
enabled
personalized
CRISPR gene
editing therapy**



May 2026: [Tune Therapeutics Presents Positive Phase 1b/2a Proof of Concept Data on TUNE-401: a First-in-Class Epigenetic Silencer for Patients with Hepatitis B at EASL 2026](#)



May 2026: [Scribe Therapeutics Presents Late-Breaking Preclinical Data Supporting STX-1150, a Clinical-Stage Epigenetic Silencing Therapy Designed to Achieve Years of LDL-C Lowering After a Single Dose](#)



May 2026: [Ukko Announces First Participant Dosed in Phase 1/2a Clinical Study Evaluating UKK-0018 for Peanut Allergy Treatment](#)



April 2026: [CREATE Medicines Doses First Patient in Phase 1/2 Study of MT-304, a First-in-Class Multi-immune In Vivo CAR Therapy Targeting HER2-Positive Solid Tumors](#)

December 2025: [CREATE Medicines Doses First Patient in Frontline HCC Trial Evaluating MT-303, an In Vivo CAR Therapy, in Combination with Standard-of-Care Immunotherapy](#)

November 2025: [CREATE Medicines Announces Positive First-in-Human Results for MT-302](#)



January 2026: [nChroma Bio Announces First Patient Dosed in Phase 1/2 Clinical Trial of Epigenetic Silencer CRMA-1001 for Chronic Hepatitis B](#)



January 2026: [Centivax Initiates Phase 1 First-in-Human Clinical Trial of Universal Flu Vaccine](#)



November 2025: [Precision BioSciences Presents Late-Breaking Phase 1 PBGENE-HBV Data at AASLD The Liver Meeting@ Showing Safety, Tolerability and Cumulative, Dose-Dependent Antiviral Activity in First Three Cohorts](#)

November 2025: [Metagenomi Presents New Preclinical Data from MGX-001 Hemophilia A Program Supporting Advancement into Clinical Development](#)



Aug 2025: [Beam Therapeutics Provides Update on BEAM-302 Development Progress in Alpha-1 Antitrypsin Deficiency \(AATD\)](#)



July 2025: [Arbor Biotechnologies Announces First Patient Dosed at Mayo Clinic in the redePHine Phase 1/2 Study of ABO-101, an Investigational Gene Editing Treatment for Primary Hyperoxaluria Type 1](#)



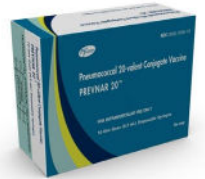
Sept 2024: [CureVac's CVGBM Cancer Vaccine Induces Promising Immune Responses in Phase 1 Study in Glioblastoma Presented at the ESMO 2024 Congress](#)



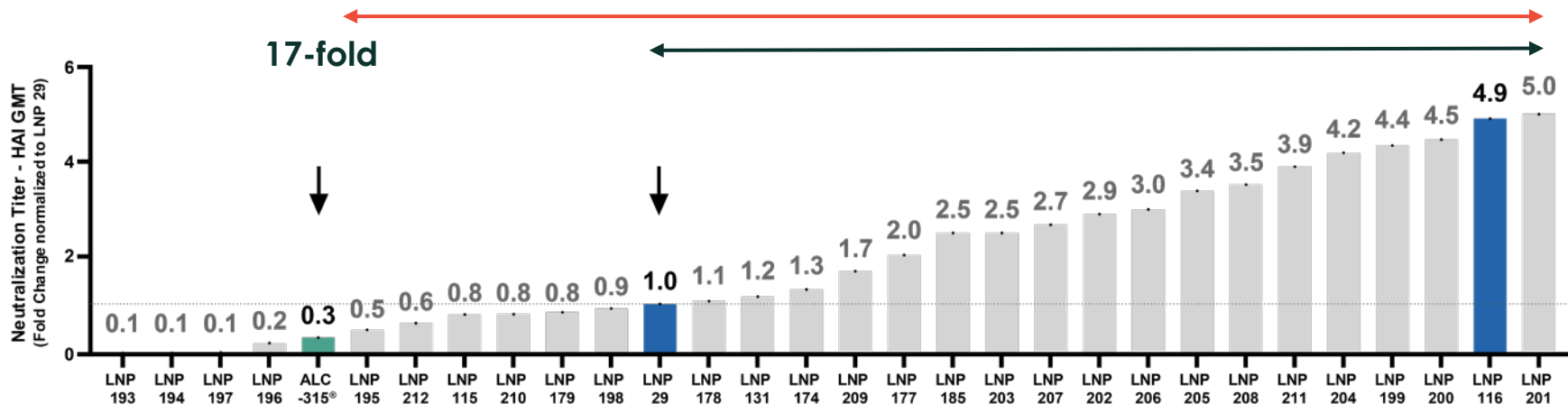
Next Generation LNP Technology for Infectious Disease mRNA Vaccines

Potent LNP: A Key Enabler of Multivalent mRNA Vaccines

- Acuitas LNP (ALC-315®) technology enabled Pfizer/BioNtech vaccine Comirnaty®
- New vaccines predominantly multivalent
 - Provide broad protection against multiple viral strains
- Need for next generation LNP enabling multivalent mRNA vaccines
 - Higher potency needed to ensure protective titers against each viral strain
- Next Generation Acuitas LNP provide 5-17-fold higher potency compared to ALC-315®

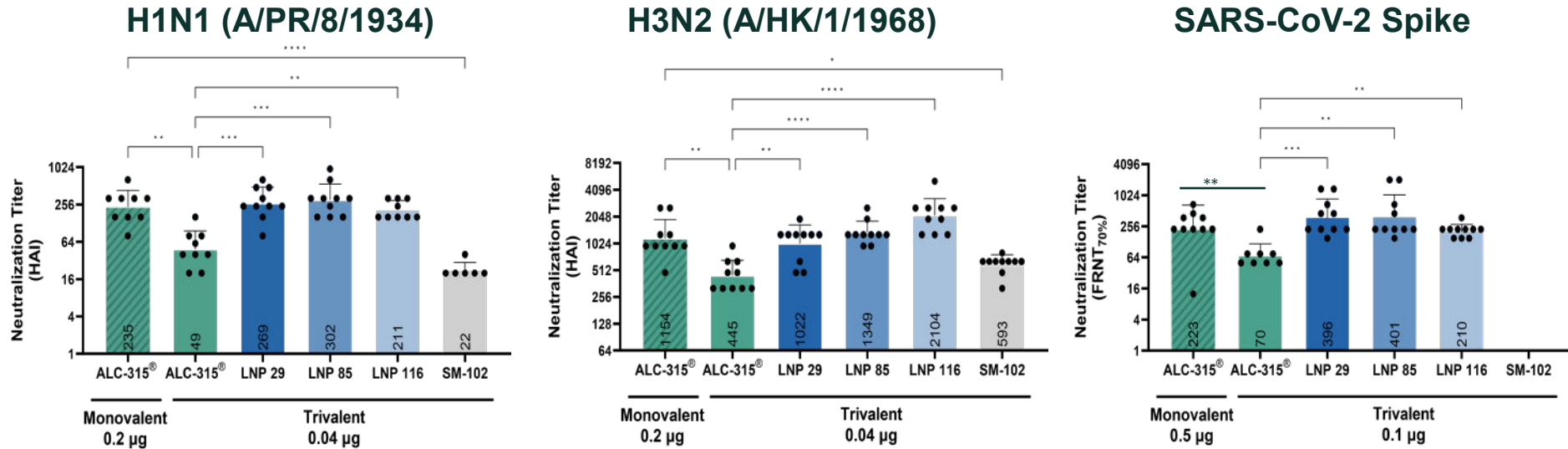


SAR-Guided Design Yields More Potent Next-Generation LNP



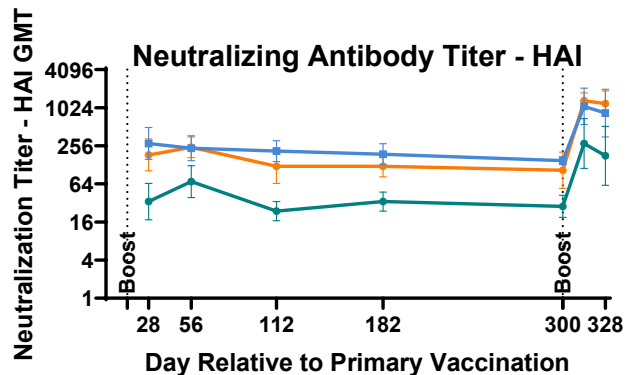
Several newly synthesized lipid LNP29 analogues, are 3 to 5- fold more potent

Enhanced LNP Potency Enables Dose-Efficient Multi-valent mRNA Vaccines

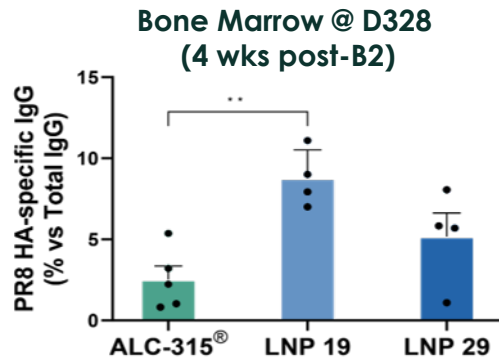
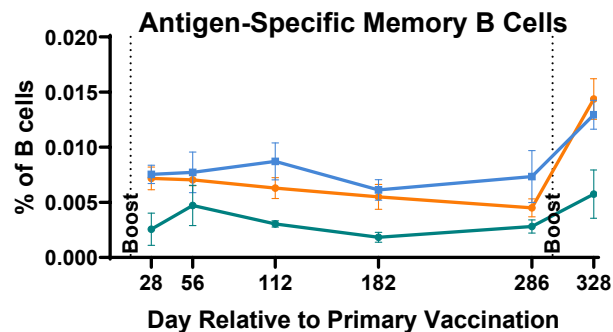


Next Gen lipid enables a 5-fold lower antigen dose while maintaining comparable antibody titers across a multi-valent vaccine

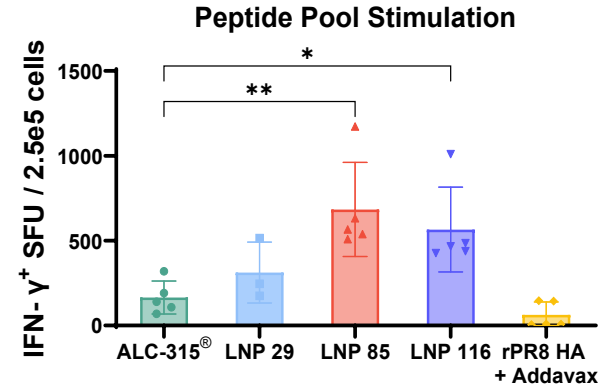
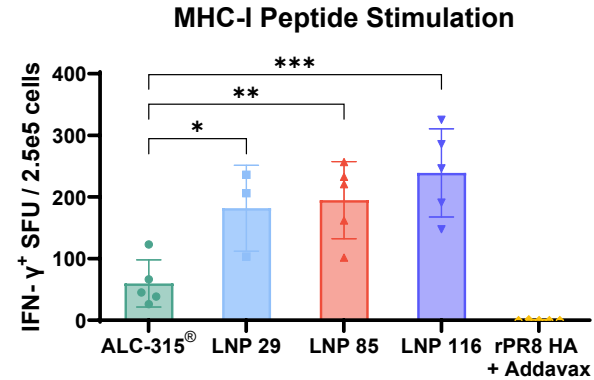
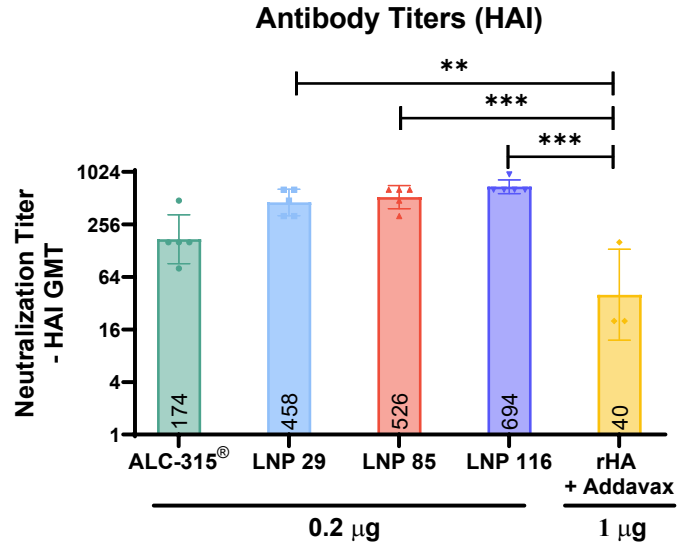
Next Generation Lipids Induces Stronger Memory B-Cell Response than ALC-315®



- Next Gen LNP maintain higher HAI titers & memory B cell pool compared to ALC-315® over 10 months



Next Generation LNP Are More Potent than Adjuvanted Protein



- Next Gen LNP outperform adjuvanted protein vaccine: stronger humoral immunity, and robust T cell responses.
- Study ongoing to assess long term memory immune response

Summary

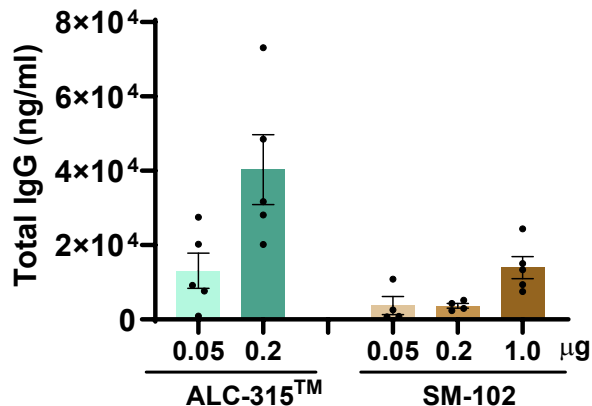
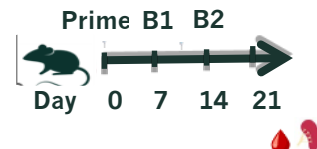
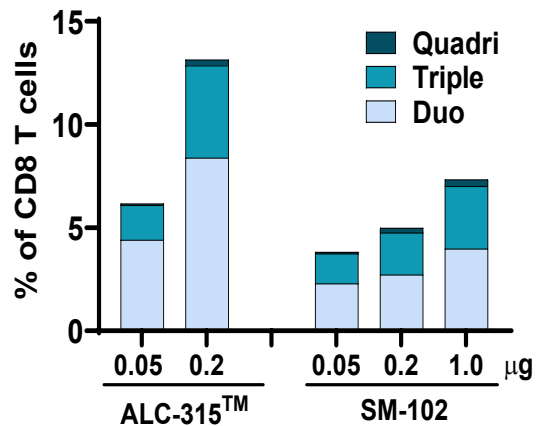
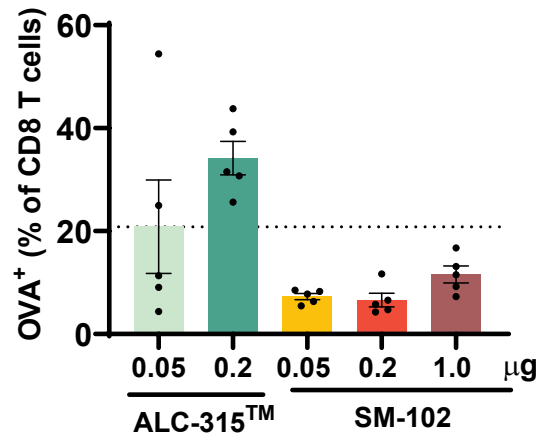
- Next Gen LNP:
 - Significantly more potent than Comirnaty LNP, ALC-315®
 - Allow multi-valent vaccines @ much lower mRNA dose than ALC-315® yet achieving equivalent activity against each antigen
 - Maintain higher HAI titers & memory B cell pool compared to ALC-315® over 10 months following prime/boost
 - Outperform adjuvanted protein vaccine for both functional antibody titers and T cell responses

LNP Development for mRNA-Based Cancer Vaccine

Highlights

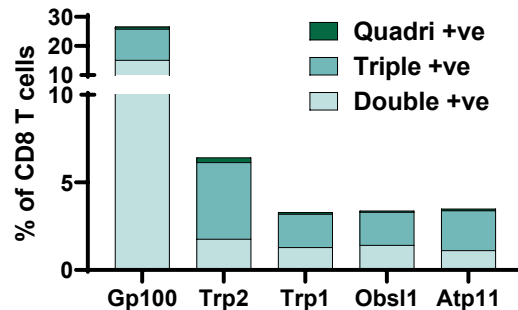
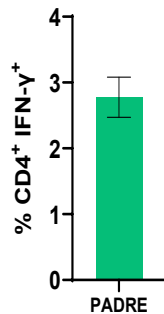
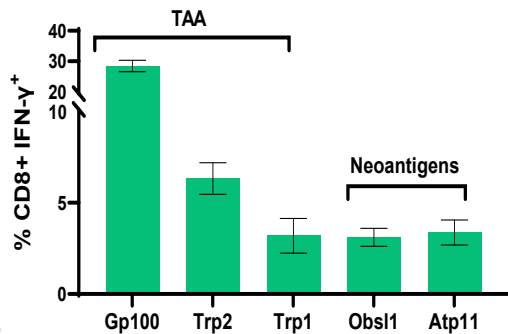
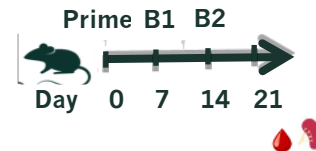
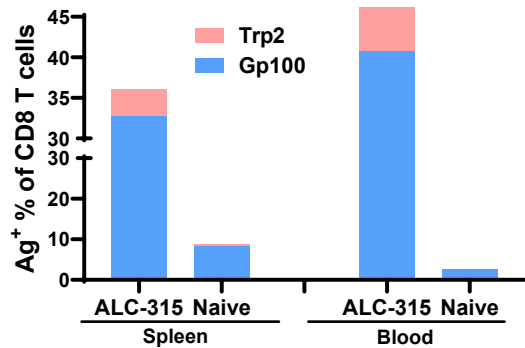
- ALC-315[®] Based mRNA LNP cancer vaccine:
 - superiority compared to non-viral delivery platforms currently in the clinic
 - induces potent and broad CD8⁺ T cell response against TAA & neoantigens in preclinical models
- Identification of novel lipid for enhanced T-cell responses

ALC-315[®] Induces Superior Immune Response Compared to SM-102

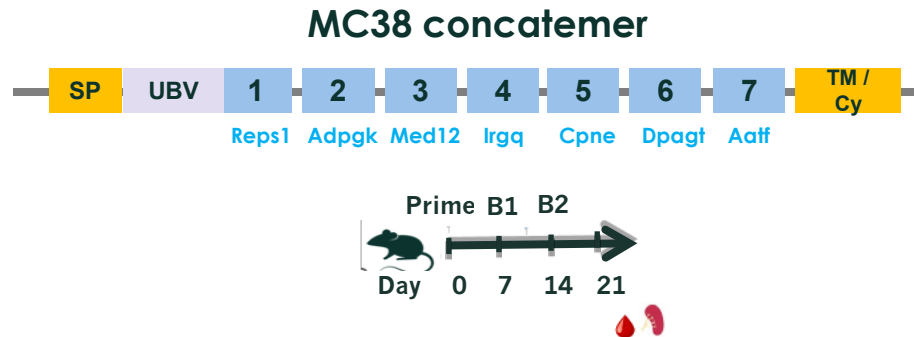
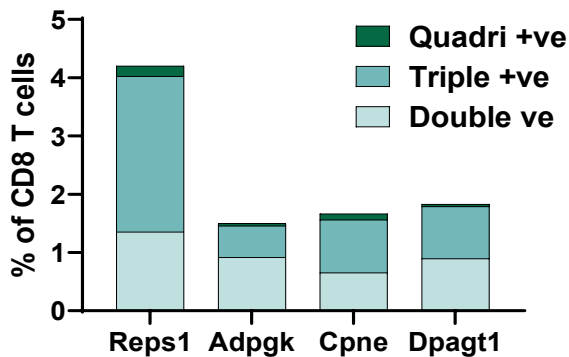
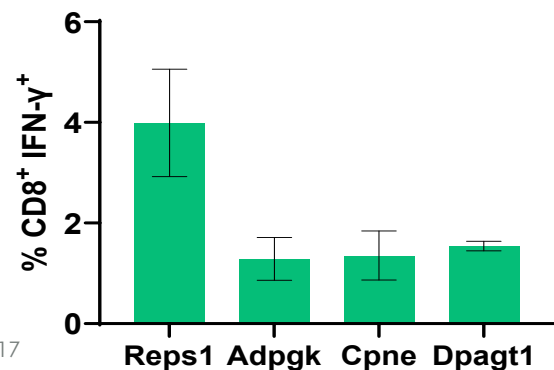
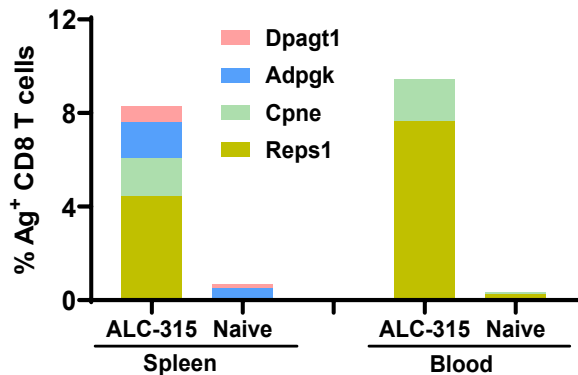


ALC-315[®] Based mRNA LNP Vaccine Elicits Potent T Cell Response Against Syngeneic Melanoma TAA & Neoantigens

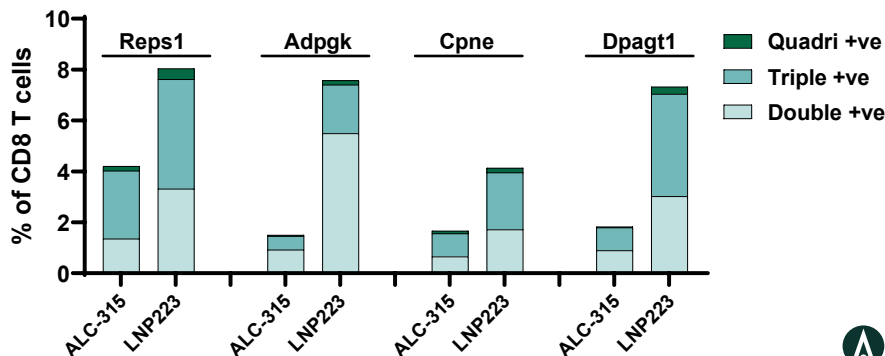
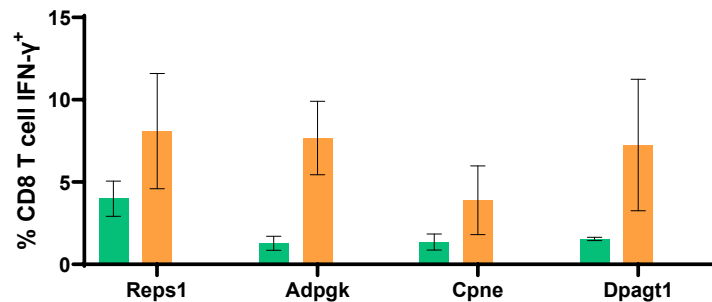
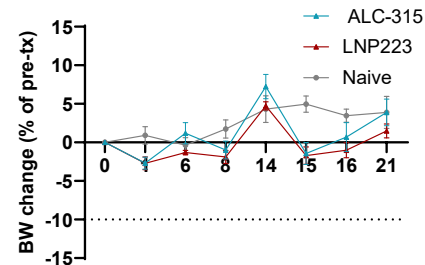
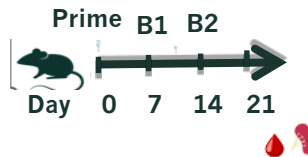
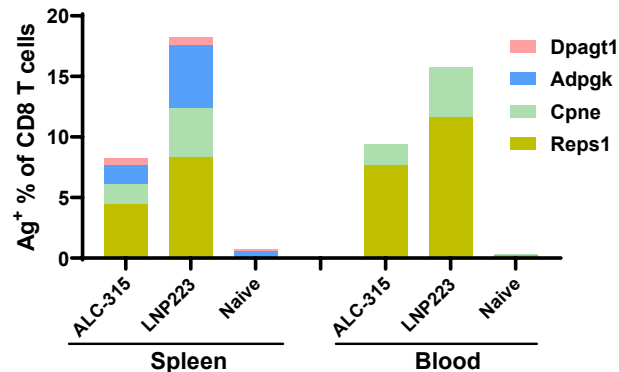
B16F10 concatemer (4 TAA, 6 neoantigens, PADRE)



ALC-315[®] Based mRNA LNP Cancer Vaccine Elicits Potent T Cell Response Against MC38 Colon Cancer Neoantigens



Novel LNP Outperforms ALC-315[®] in mRNA Cancer Vaccine Potency



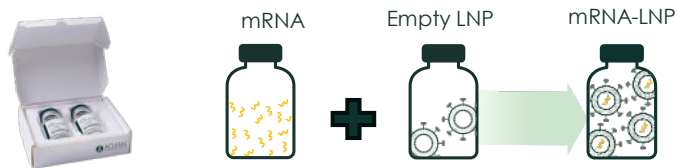
For additional data and supporting results, please visit our posters

Preformed Vesicles: PFV

Simplified Manufacture via Pre-Formed Vesicles (PFV)

PFV enables a kit format (2 vials)

where mRNA is loaded into empty LNP at point-of-care



BENEFITS



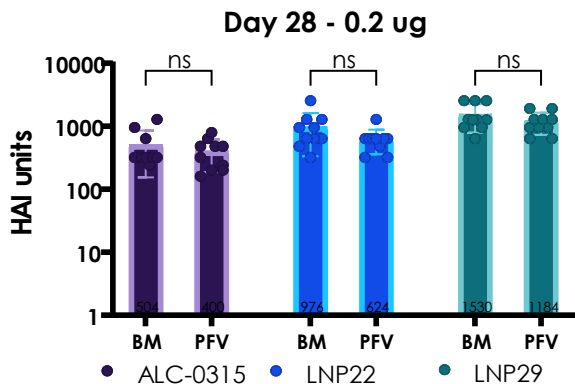
Refrigerated (2-8°C) (and potential for room temperature) long term **storage & distribution**



Flexible, small-scale manufacturing capability

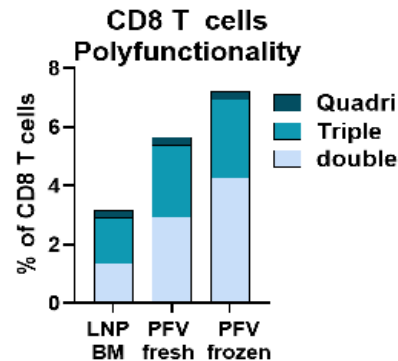


Modular, flexible, platform approach that is **fast and cost effective**



Infectious Disease Vaccines

PFV achieves equivalent or better potency to conventional LNP manufacturing methods



Cancer Vaccines