

Next Generation LNP Technology for mRNA Vaccines

March 11th 2026

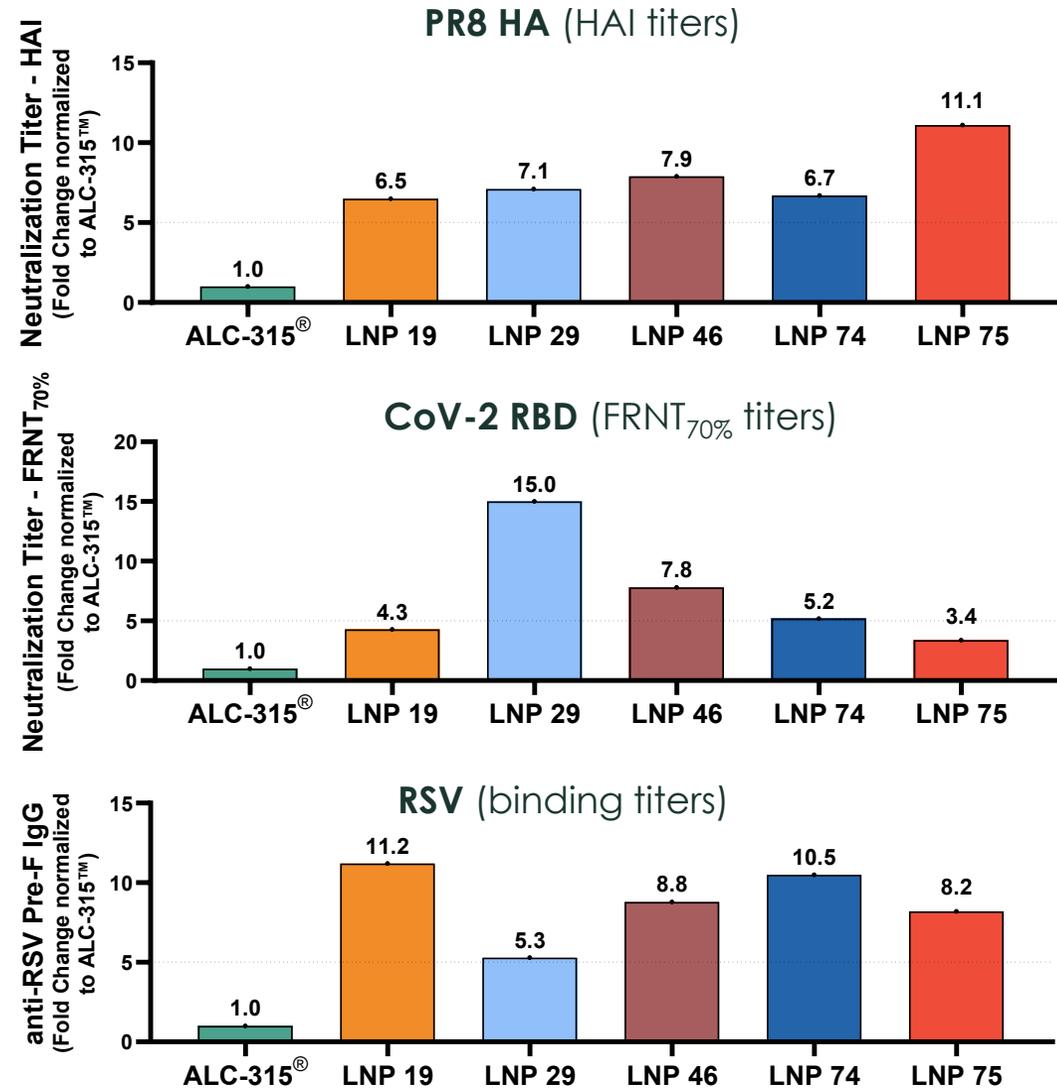
Multi-Valent mRNA Vaccines

- Acuitas LNP (ALC-315[®]) technology enables 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 5-10-fold higher potency compared to ALC-315[®]



Next Generation Vaccine LNP: Potency

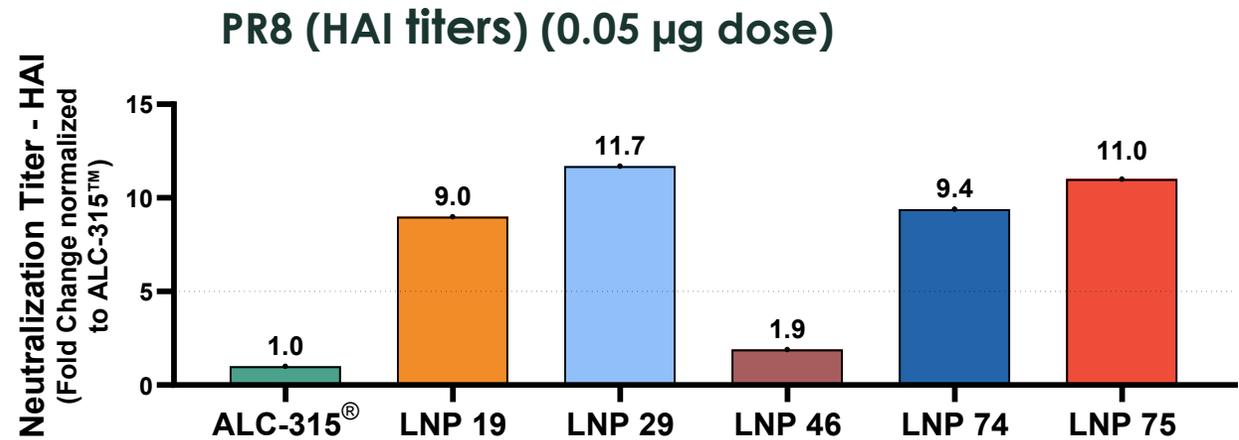
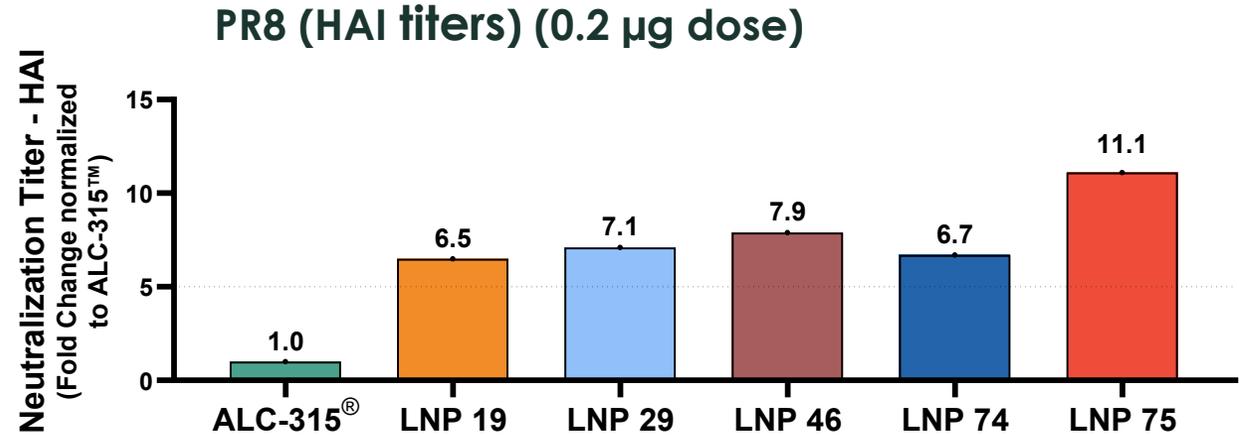
- Next Gen LNP show consistently higher antibody titers across multiple viral antigens



0.2ug dose for PR8 & RSV, 0.5 ug for RBD, prime/boost: D1/D14, HAI, nAb @ D28, 8-10 mice per group

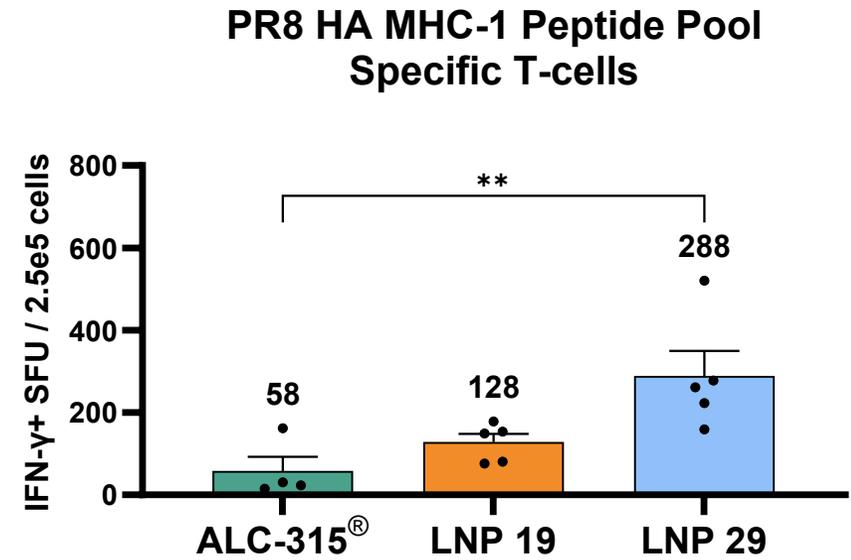
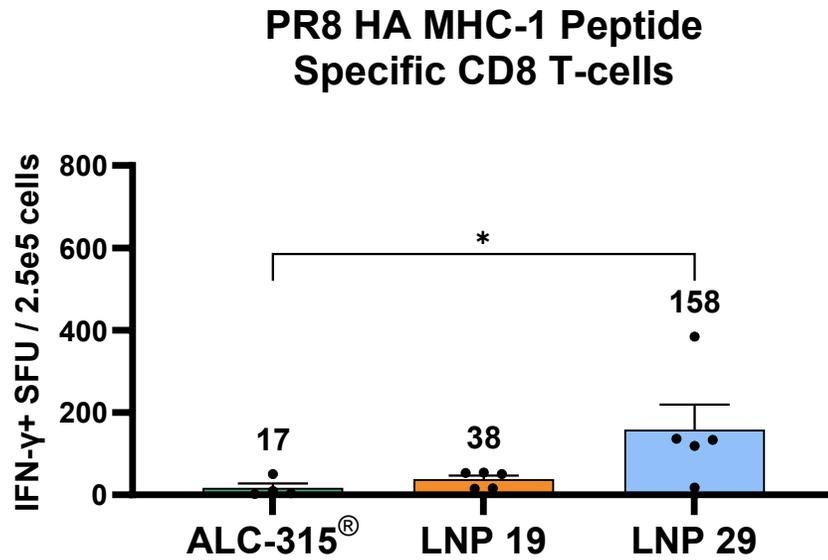
Next Generation Vaccine LNP: Potency

- Enhanced LNP potency typically independent of vaccine dose



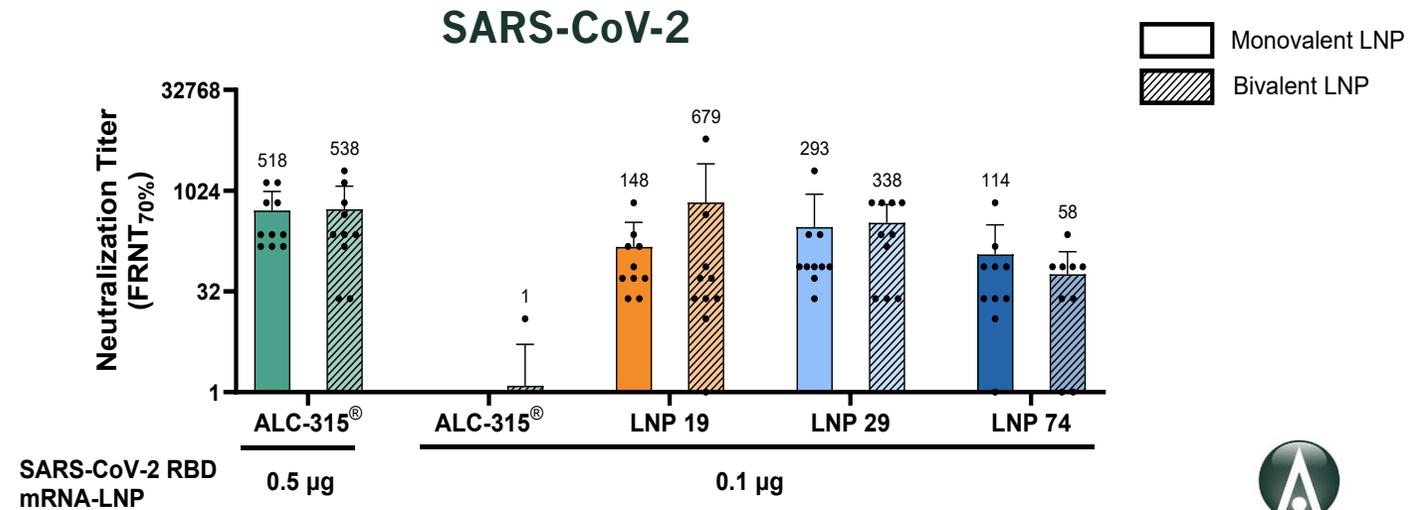
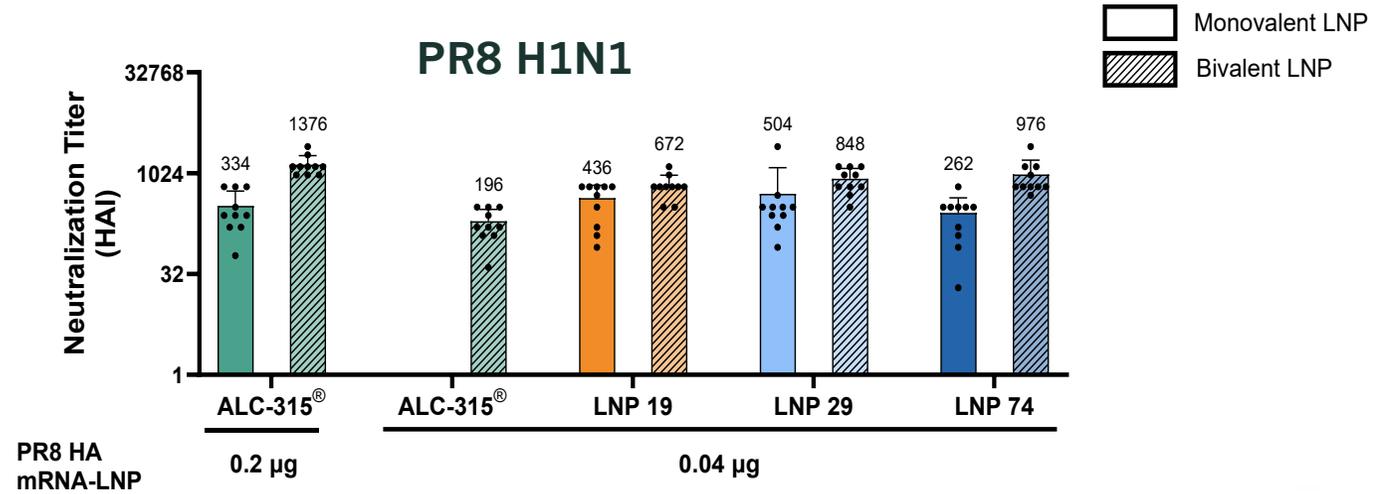
PR8 HA Vaccine Studies: T cell Response

➤ Next Gen LNP induce superior T cell responses compared to ALC-315[®]



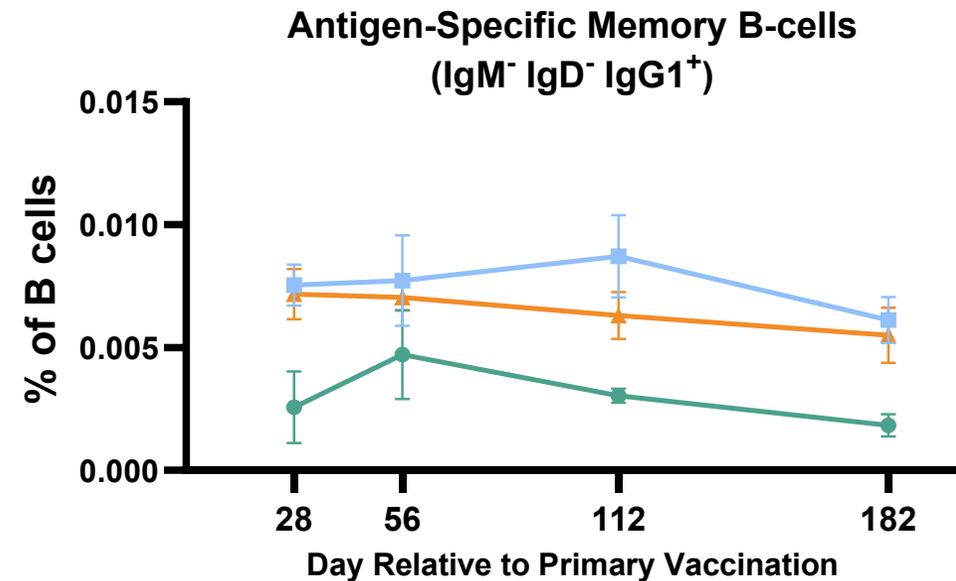
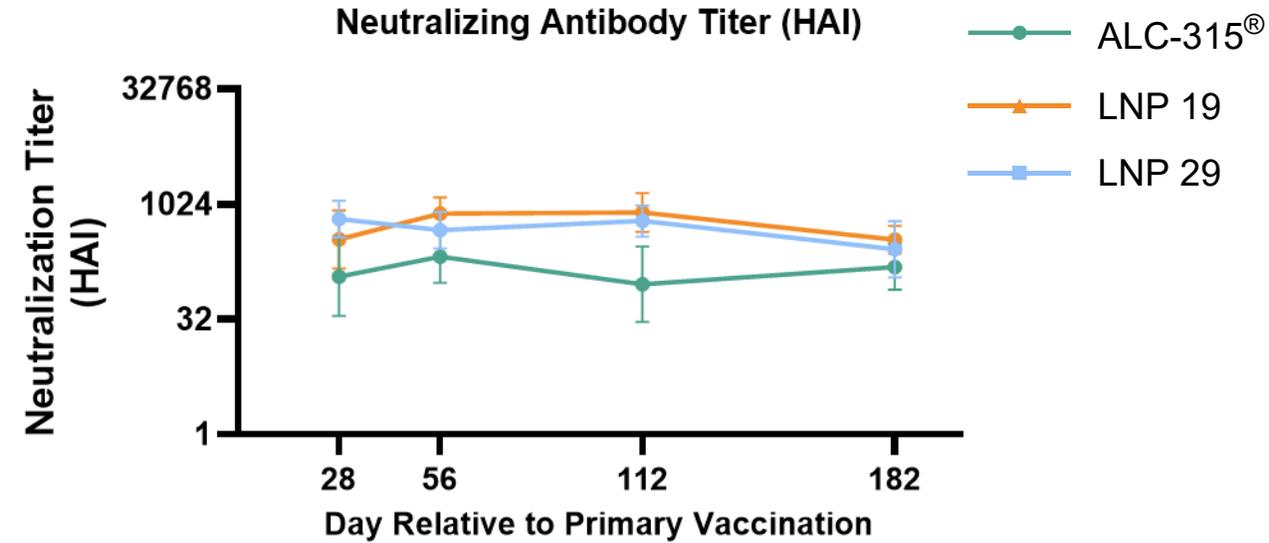
Next Generation Vaccine LNP: Multi-Valent Potency

➤ Next Gen LNP provide similar neutralization titers at five-fold lower dose



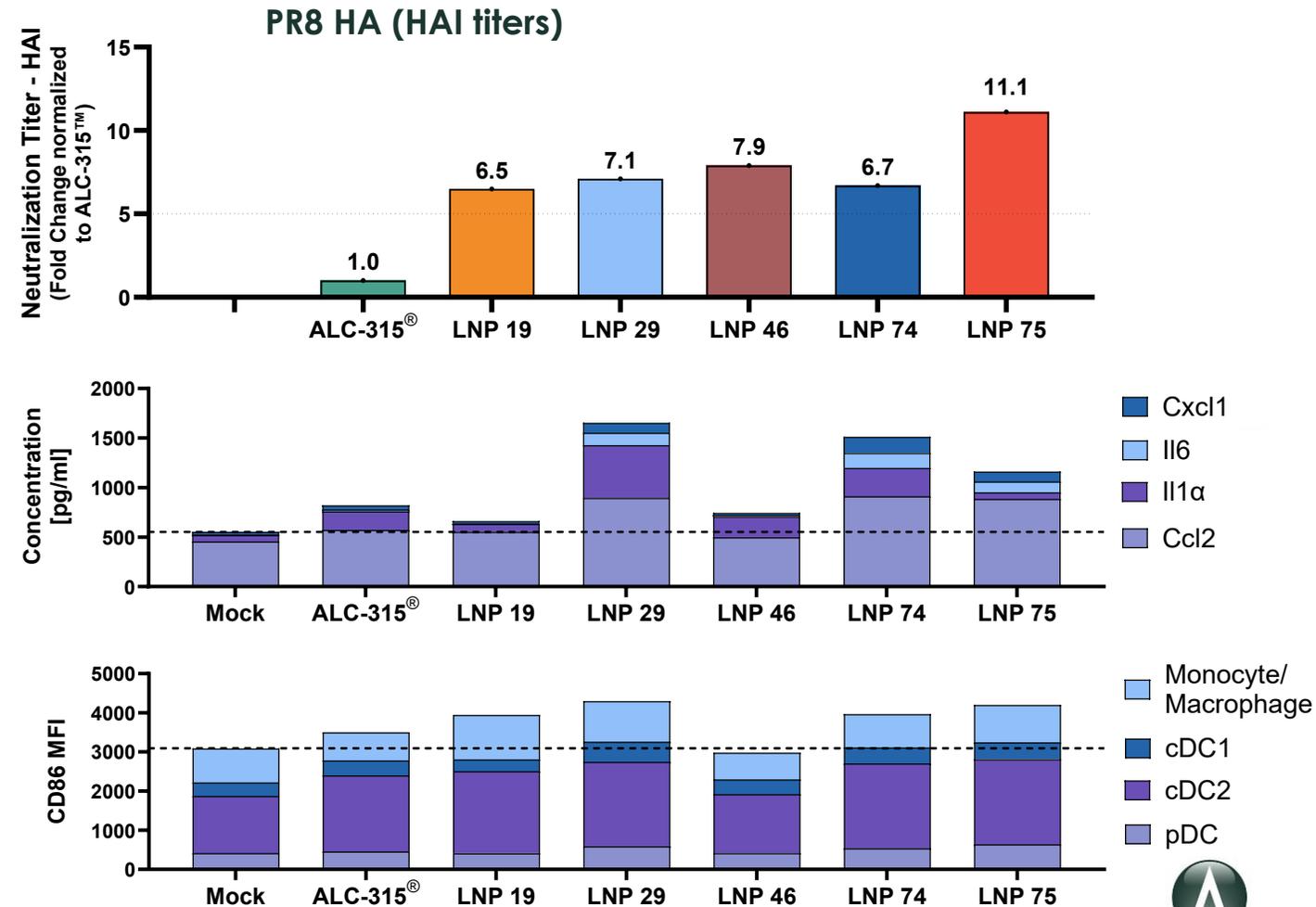
Vaccine Durability (6-months, study ongoing)

➤ Next Gen LNP maintain higher neutralization titers compared to ALC-315[®] >6 months



Next Gen Vaccine LNP: Innate Immune Stimulation

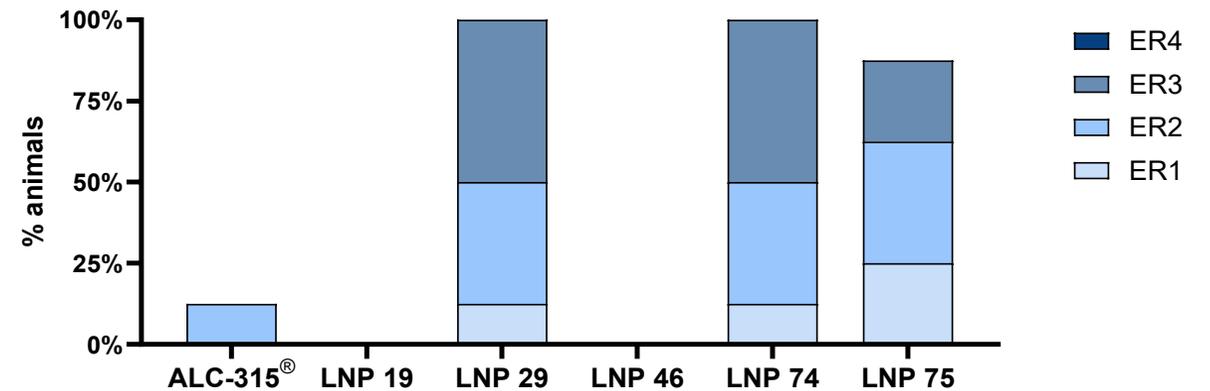
- No correlation between pro-inflammatory cytokine expression or APC activation & vaccine potency
- Several LNPs innate immune silent despite being more potent than ALC-315[®]



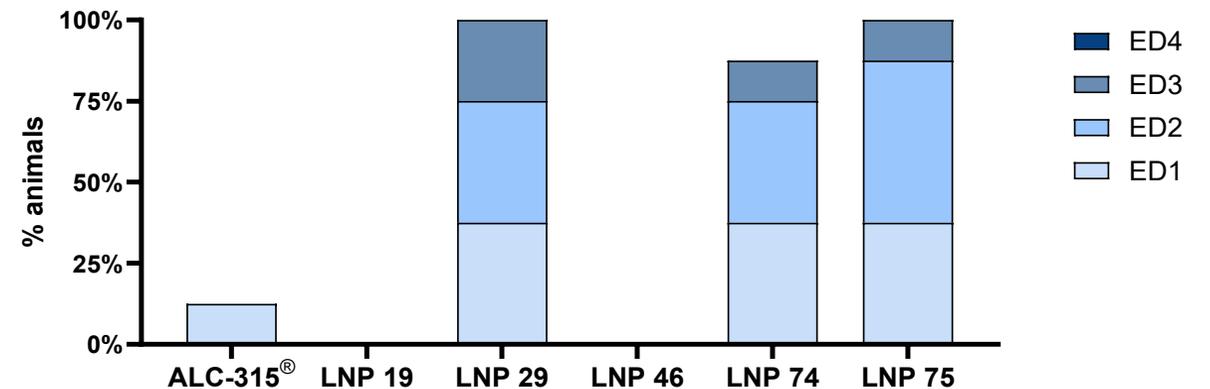
Next Generation Vaccine LNP: Reactogenicity

- Acceptable reactogenicity across all Next Gen LNP
- Minimal reactogenicity seen for select LNP

Erythema - 30 µg



Edema - 30 µg



Summary: Next Generation Vaccine LNP

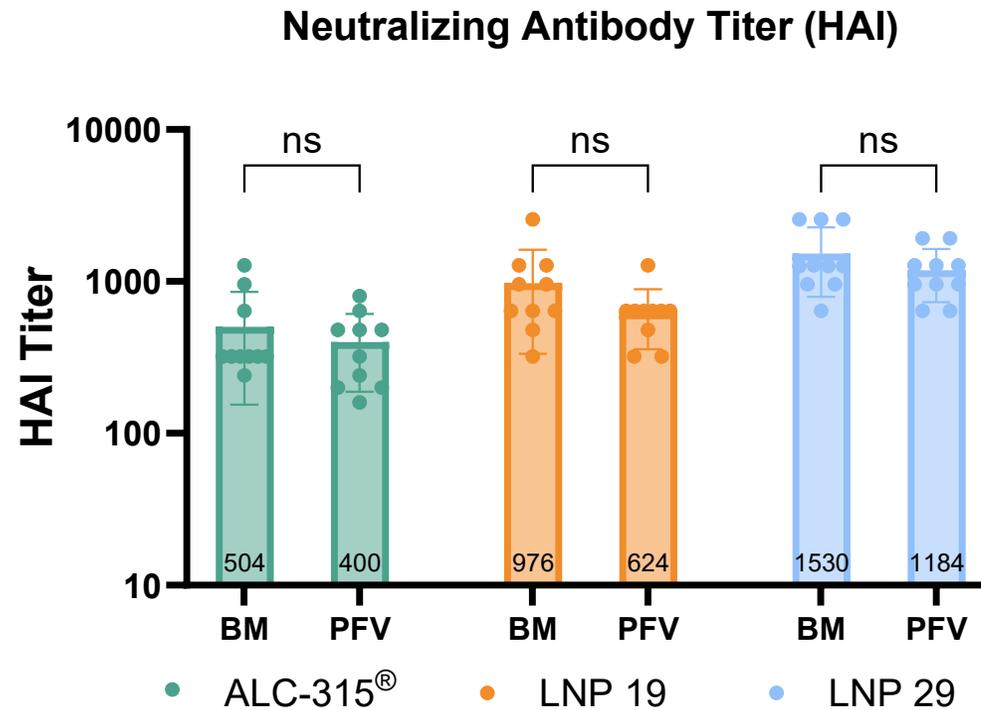
- Next Generation LNP provide greater than 5-fold increase in potency for multi-valent vaccines
 - Higher T cell responses
 - Higher memory B cell pool
- Elevated neutralizing antibody titers are maintained over 6 months (studies ongoing)
- Enhanced potency of Next Gen LNP independent of innate immune response.
- Higher antigen expression in secondary lymphoid tissues likely correlates with enhanced potency.
- Transient reactogenicity findings are acceptable & consistent with immune stimulation and inflammatory responses

Alternative mRNA LNP Vaccine Format: Preformed Vesicles (PFV)

- Kit format (2 vials)
- Messenger RNA loaded into empty LNP at point-of-care



PFV Vaccine Format: Potency



Standard Benchmark (BM) manufacturing method and PFV method produce equivalent in vivo performance across 3 leading vaccine formulations.

Summary: PFV Vaccine Format

- Provides additional flexibility for regional-specific vaccine formats
- Allows delayed selection of prevalent viral strains for seasonal vaccines
- Allows room temperature or refrigerated (2-8°C) storage & distribution
- Also ideally suited for personalized cancer vaccines and rare genetic diseases
 - Patient-specific payloads loaded into PFV prior to administration
 - No large-scale manufacture required