

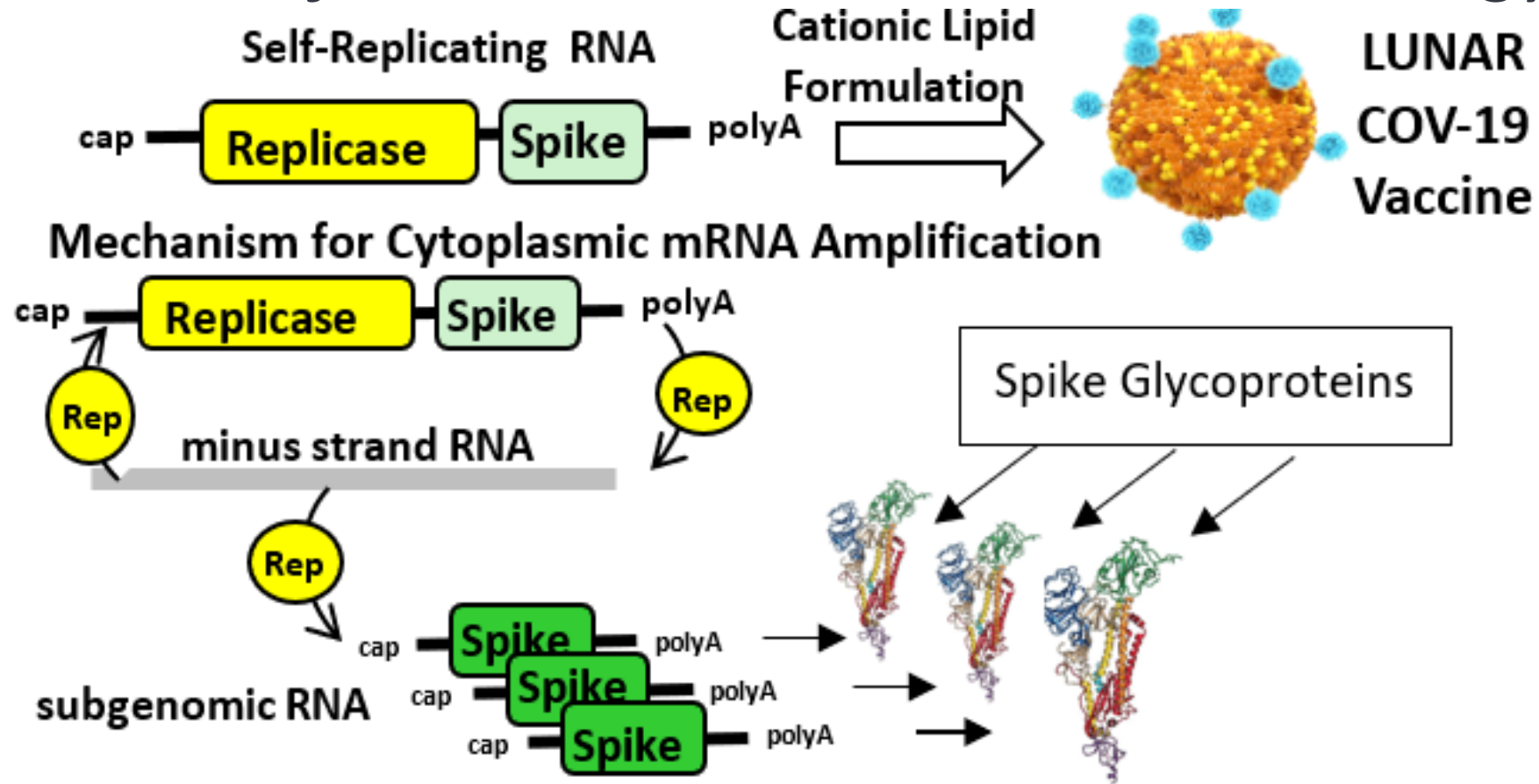
LUNAR-COV19 Vaccine

Arcturus Therapeutics: Building the Next Generation of RNA Medicines

Sean Sullivan, Executive Director, Process Development, Frontier Sciences

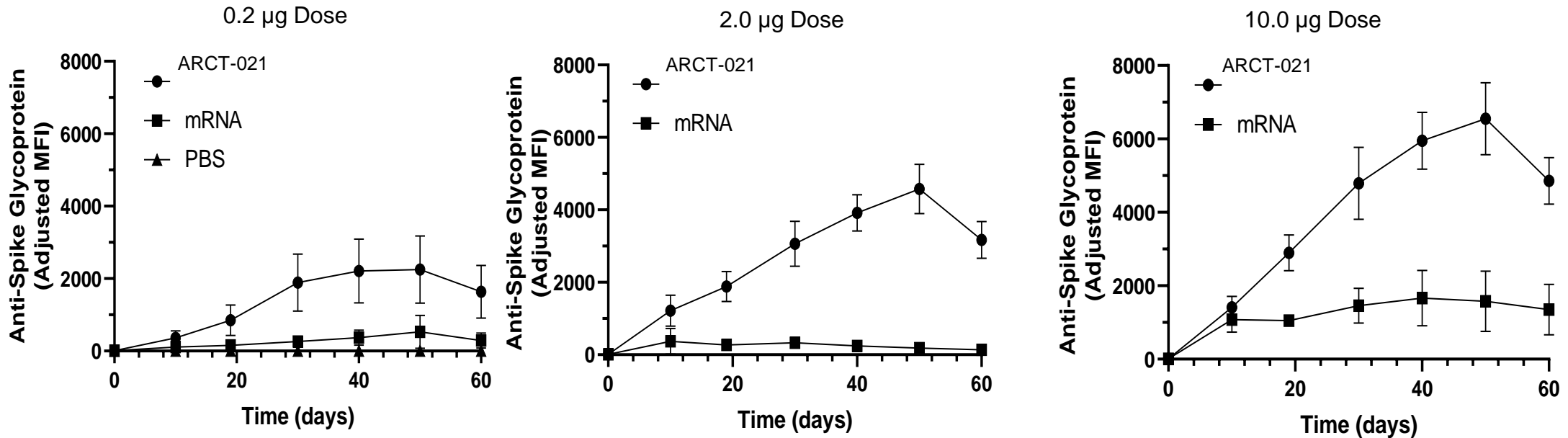
LUNAR COV-19 Vaccine

Combination of LUNAR[®] and STARR[™] Technology



STARR[™] technology can be used to generate a protective immune response or drive therapeutic protein expression

Anti-Spike Glycoprotein IgG Antibody Titters

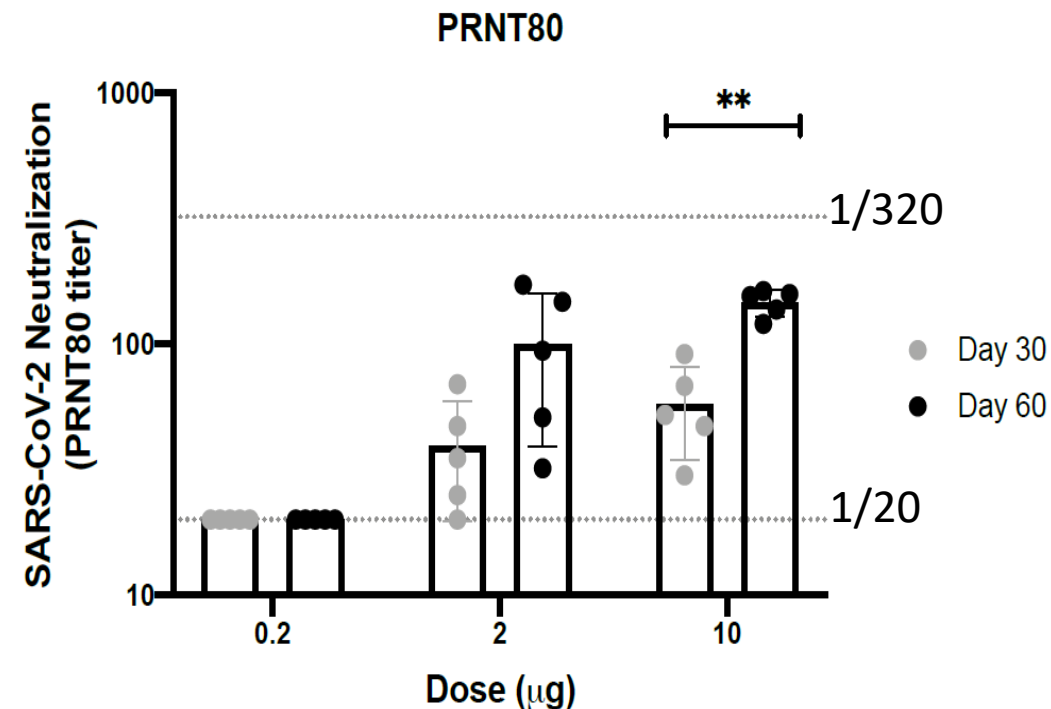
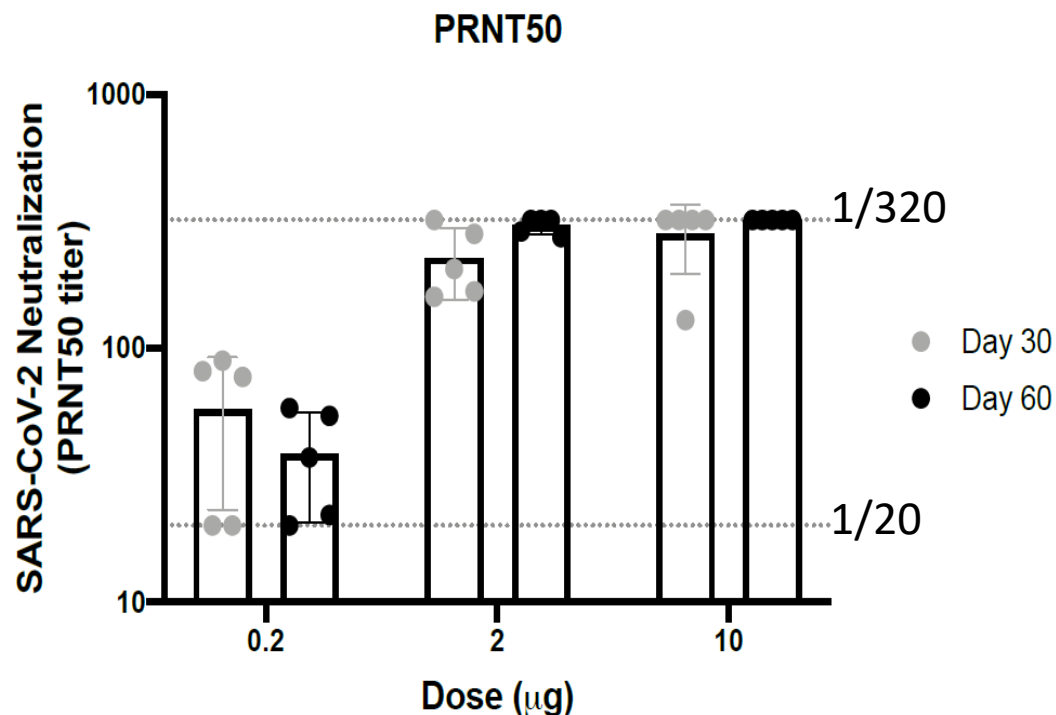


Summary of Results

- Higher anti-SARS-CoV-2 Spike Glycoprotein IgG elicited by STARR™ RNA compared to mRNA after single vaccination
- IgG produced by STARR™ vaccination continues to increase up to day 40 for the 0.2 µg and day 50 for the 2.0 µg and 10 µg RNA doses, whereas the IgG levels produced by the mRNA plateaued at day 10



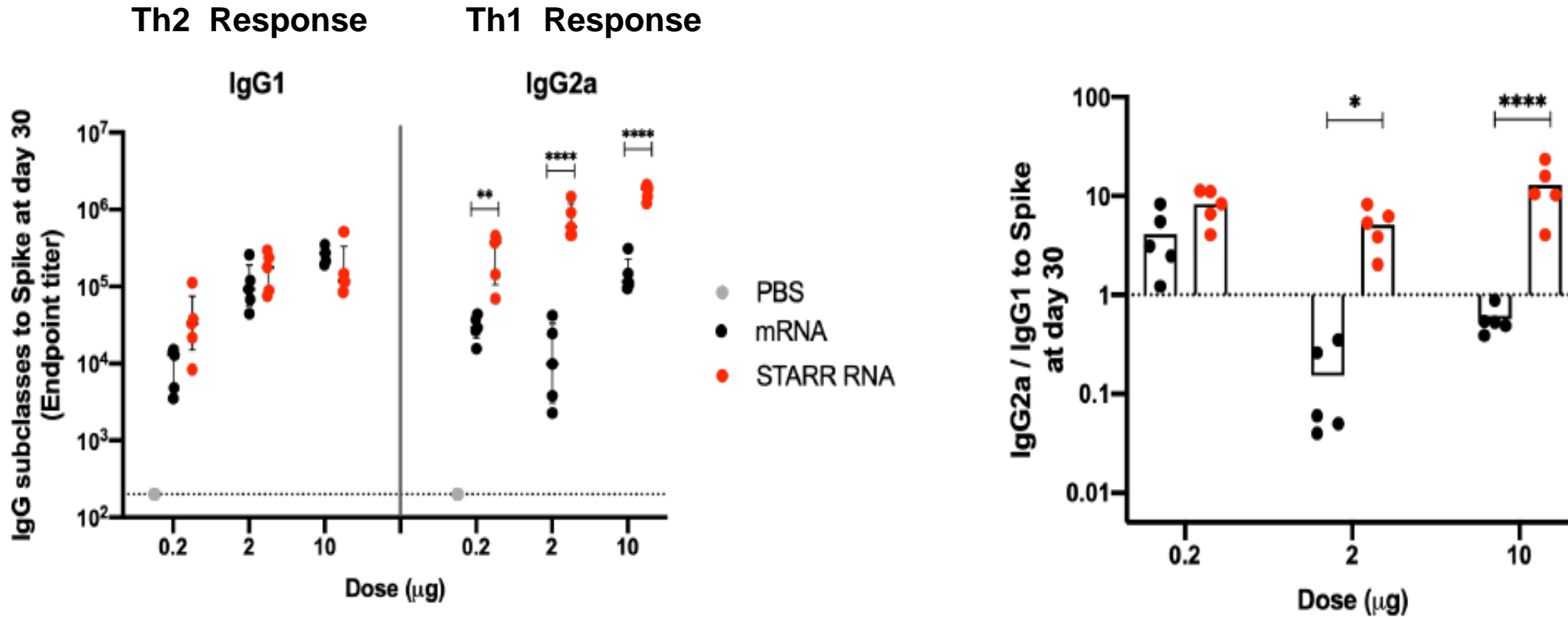
Day 30 and Day 60 Mouse Neutralizing Antibody Titers



- 0.2 µg RNA dose showed 80% seroconversion by day 30 and 100% seroconversion by day 60 post vaccination
- 2.0 µg and 10 µg RNA doses yielded 100% seroconversion by day 30 and maintained 100% seroconversion by day 60 post vaccination
- PRNT 80 neutralizing antibody increased ~2-fold from day 30 to day 60 for the 2.0 µg and 10 µg RNA doses

STARR vs mRNA SARS-CoV-2 Vaccine

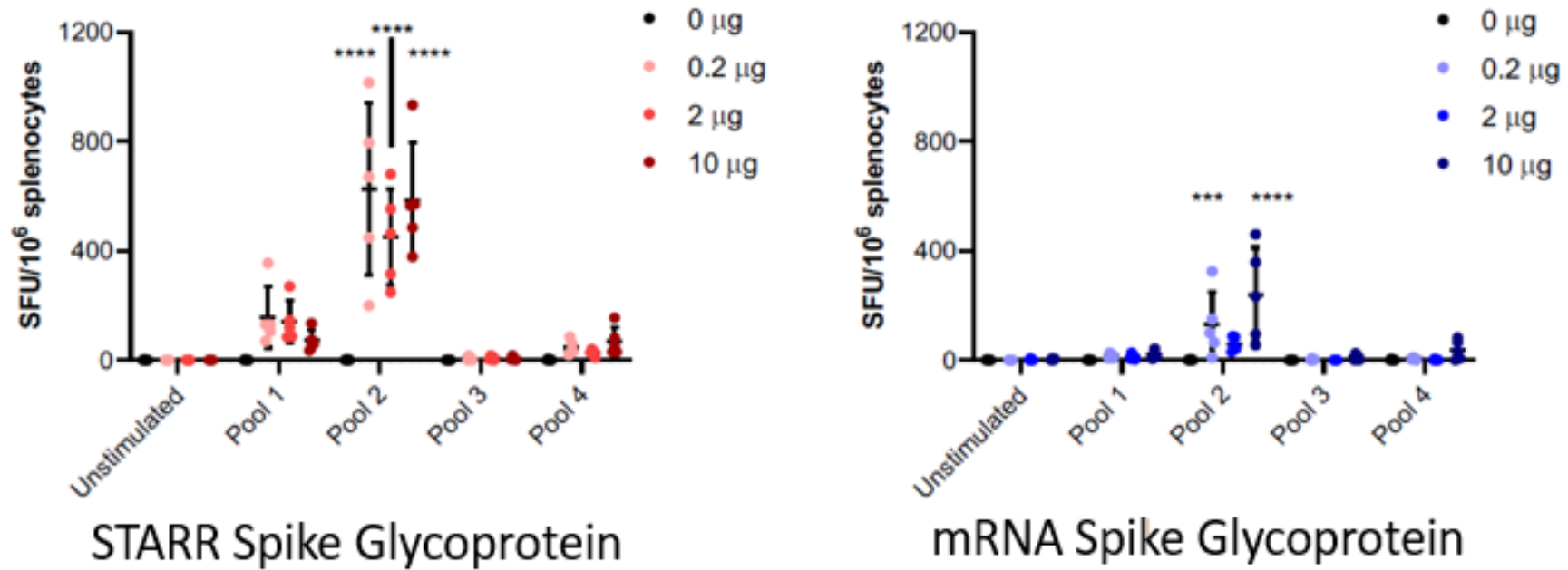
Th1 response vs. Th2 Response in Balb/c Mice



- STARR and mRNA-based vaccines have a Th1 response at the 0.2 μg RNA Dose (IgG2a/IgG1 >1)
- 2.0 μg and 10 μg RNA doses show STARR based vaccine maintain a Th1 response whereas mRNA-based vaccine has a Th2 response (IgG2a/IgG1 <1)

STARR vs mRNA SARS-CoV-2 Vaccine

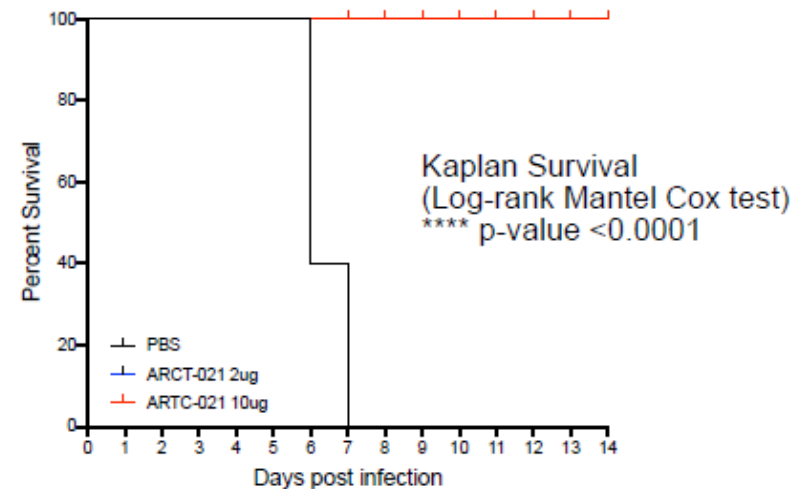
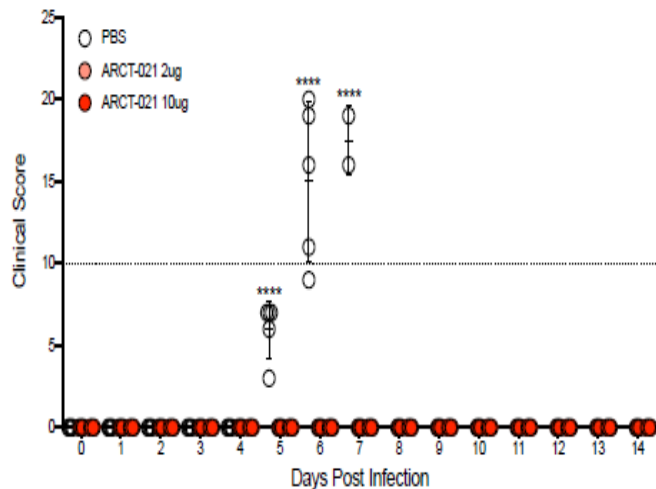
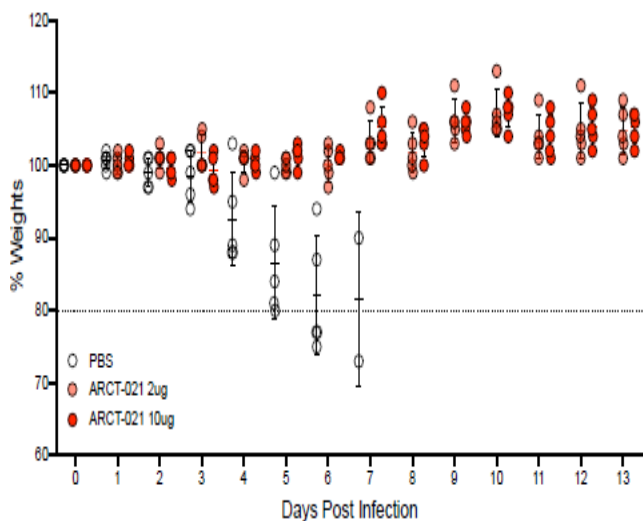
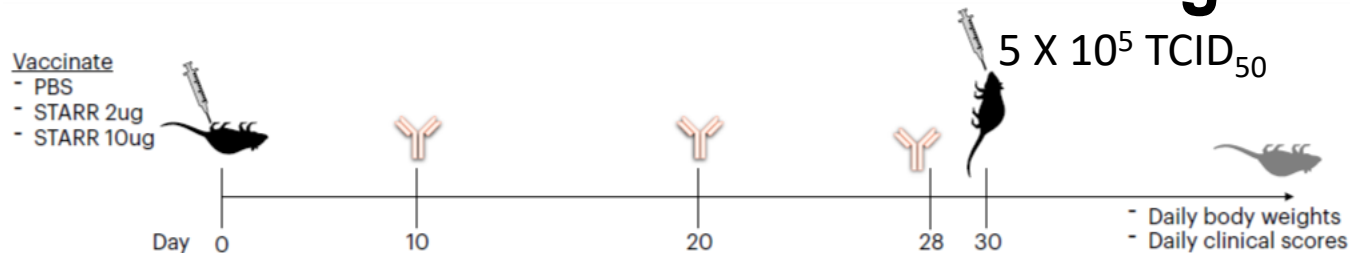
Spike Glycoprotein Specific T Cell Immune Response



ELISPOT Results

- STARR based vaccine produced higher number of spike glycoprotein specific T cells than mRNA-based vaccine
- The highest response was observed for Pool 2 and to a lesser extent to Pool 1

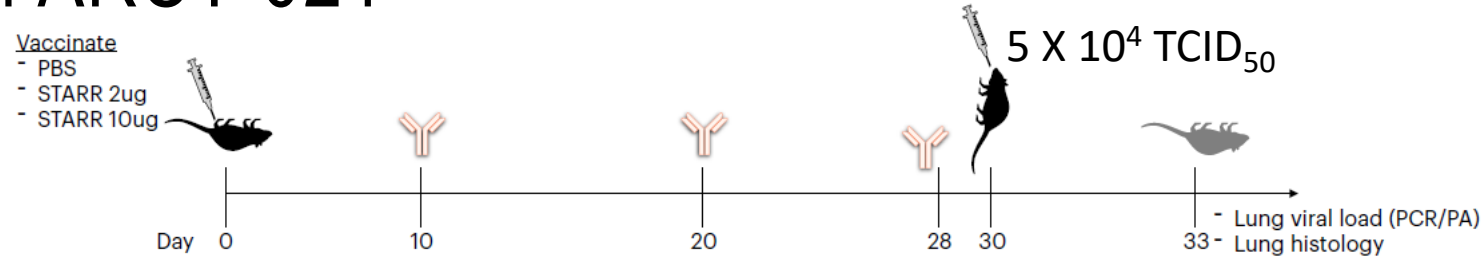
Single Vaccination of ARCT-021 Completely Protects Transgenic Mice from Viral Lethal Challenge



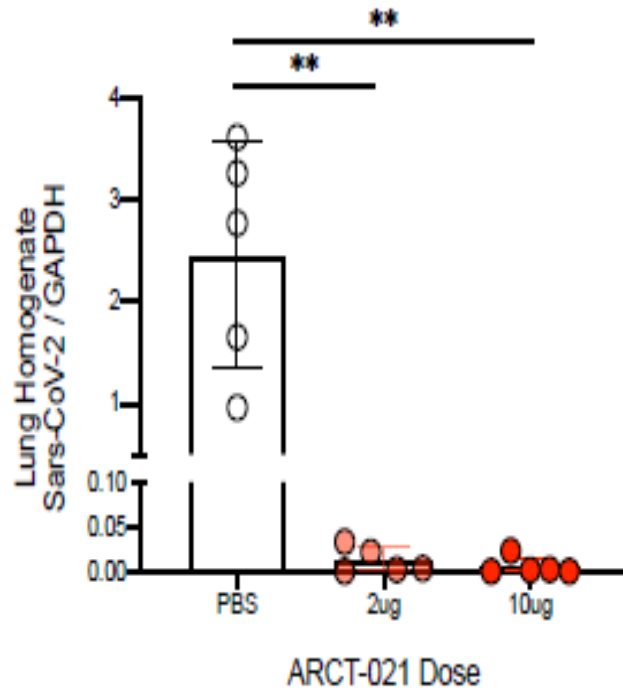
SARS-CoV-2 Virus Challenge Results

- Transgenic mice vaccinated with a single dose of either 2 μg or 10 μg RNA dose of ARCT-021 were completely protected from SARS-CoV-2 infection for 14 days post viral lethal challenge and showed no sign of infection based on body weight, clinical scores and behavior

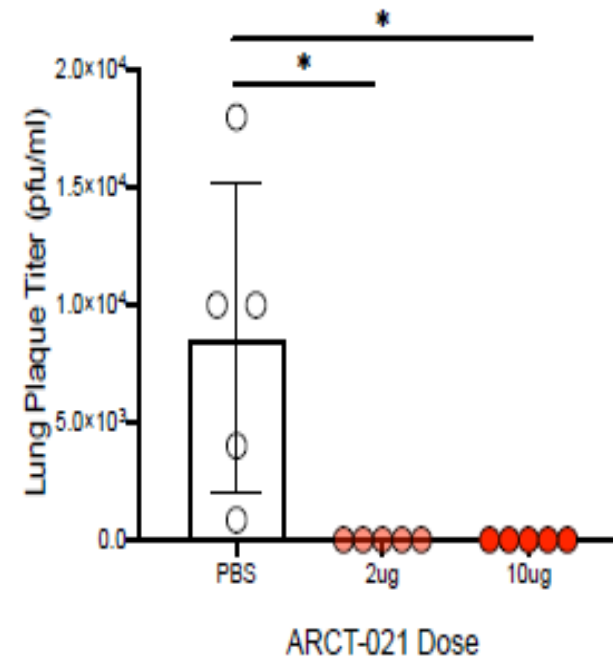
No Viral Infection Detected in Transgenic Mouse Lungs Vaccinated with ARCT-021



Lung Virus Copy Number



Lung Infectious Virus



No RT-PCR detectable viral RNA and no infectious virus detected in transgenic mouse lungs 5 days post sublethal viral challenge



LUNAR-COV19 Data Summary

- **Very low dose:** Strong neutralizing antibody response with just a single dose of 0.2 – 10 µg STARR™ RNA
- **Strong humoral response:** continuous increase in neutralizing antibodies beyond Day 60
- **Strong T-cell response:** dose response increase in IFN-g positive CD8⁺ T-cells
- **Complete protection** against viral lethal challenge 30 days post single vaccination
- **Balanced cellular immune response** – minimizes potential for enhanced respiratory disease (ERD) and lower dose may yield lower local and systemic reactogenic events suggesting a promising safety profile
- **Superior** immunogenic profile of STARR™ compared to conventional mRNA
- **No virus material, adjuvants, preservatives or antibiotics:** reduces public concerns

Arcturus LUNAR-COV19 is a most promising COVID-19 vaccine