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Evaluating an intranasal vaccine platform for mucosal immunity against respiratory pathogens like SARS-CoV-2

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Let's smell Immunity

Background:

1 COVID-19 has a wide distribution globally amongst humans, animals and the environment

2 Vaccination and prospective immunization currently prevent 4-5 million deaths annually

3 Respiratory-route vaccination activates mucosal immunity at the SARS-CoV-2 replication site, facilitating sterilizing immunity and decreasing the frequency of emerging variants

Hypothesis:

1 Continuous passage of vaccine in eggs and VERO cells at lower temperatures derives a cold-adapted phenotype.

2 Cold-adapted vaccine administered intranasally or through aerosol in sheep, elicits an enhanced immune response against SARS-CoV-2, compared to non-cold-adapted vaccine.

Results:

Cold-adaptation and temperature-restriction phenotype achieved after 20 passages

S-protein expression remains intact following multiple passages
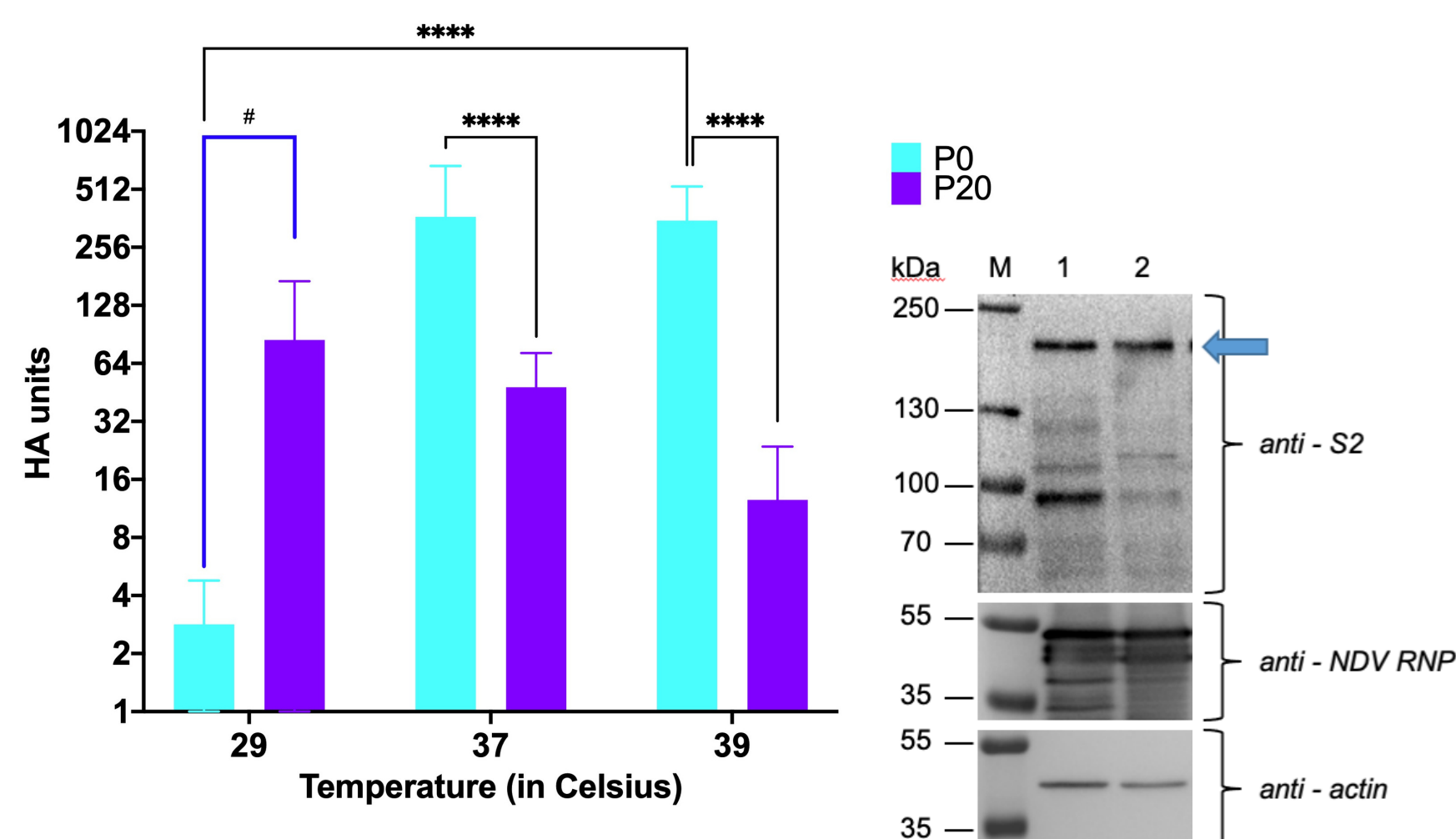
Future Work:

Complete vaccination and data analyses in sheep

Utilize next genome sequencing to correlate a cold-adapted phenotype with a genotype