PROTECT
A COVID-19 National Core Study

Asymptomatic/mild SARS-CoV-2 Skin-Skin & Bio-aerosols Transmission

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Theme 5: Experimental Infection

Investigating mechanisms of transmission:

- Generation of infectious bioaerosols
- Skin-skin touch transfers for infection initiation
- Genetic markers associated with increased virus survival or generation of airborne viral particles

PROTECT Researcher Symposium 5-6 May 2022

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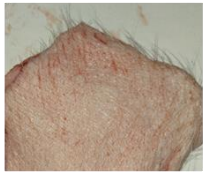
Objective 1

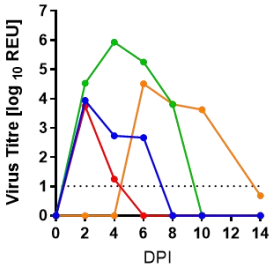
Human Forearm

Porcine Armpit



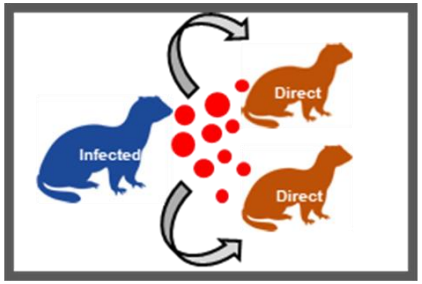
Ability of SARS-CoV-2 to remain infectious on skin & the effect of multiple skin-skin touch transfers

Objective 2



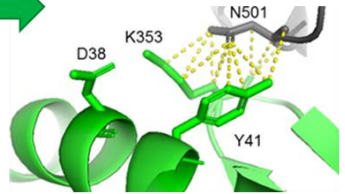
Can skin act as a viable source for SARS-CoV-2 infection in ferrets

Objective 3



Characterise bioaerosol generation during asymptomatic/ mild SARS-CoV-2 infection

Objective 4



Genetic markers associated with increased viral survival or bioaerosol generation

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Conclusions

- Porcine skin is a suitable model to compare survival properties among current and emerging SARS-CoV-2 variants.
- SARS-CoV-2 RNA detectable on skin up to 72 hours at 35.2°C and through multiple skin-to-skin contacts.
- The amount of viral RNA decreased substantially in the first few hours or after a single skin-skin contact suggesting the amount of infectious virus remaining may be relatively low.
- The amount of viral RNA detected by real-time RT-PCR was in the range observed to be expelled by patients infected with SARS-CoV-2 in respiratory samples (Sohn et al., 2020, Lee et al., 2020).

- Ferrets exposed to SARS-CoV-2 contaminated skin demonstrate productive infection.
- Combined with the skin survival/transference data this highlights the potential of skin-mediated fomite transmission.
- SARS-CoV-2 Delta variant demonstrated transmission from directly-infected animals to naive contacts.
- Low level viral RNA detected from air samples in the cages demonstrating bioaerosol environmental contamination
- Objective 4: WGS in progress to compare clinical and air samples to assess viral adaptation

Ferrets exposed to SARS-CoV-2 contaminated skin can act as a route for establishing infection, a risk pathway for human-human transmission, but also zoonotic/reverse-zoonotic transmission

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