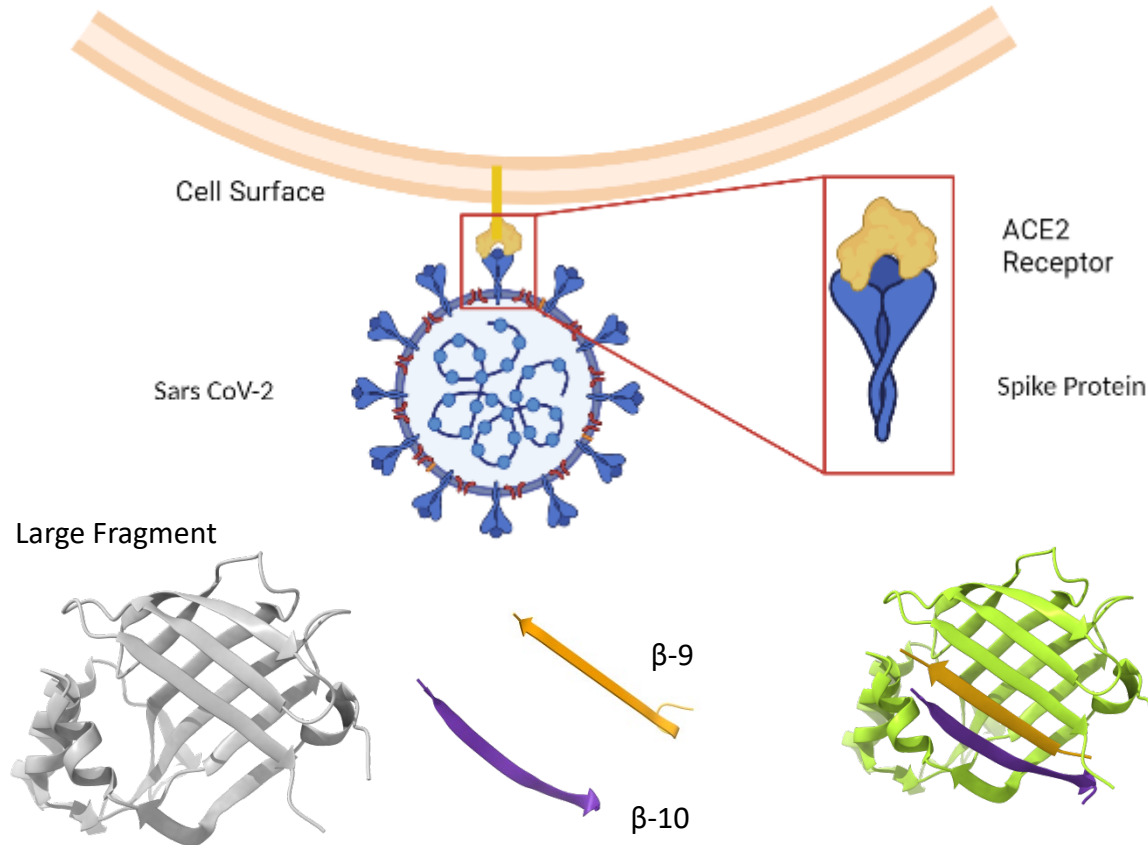


Homogeneous Surrogate Virus Neutralization Assay to Rapidly Assess Neutralization Activity of Anti-SARS-CoV-2 Antibodies

Morgan Marsh

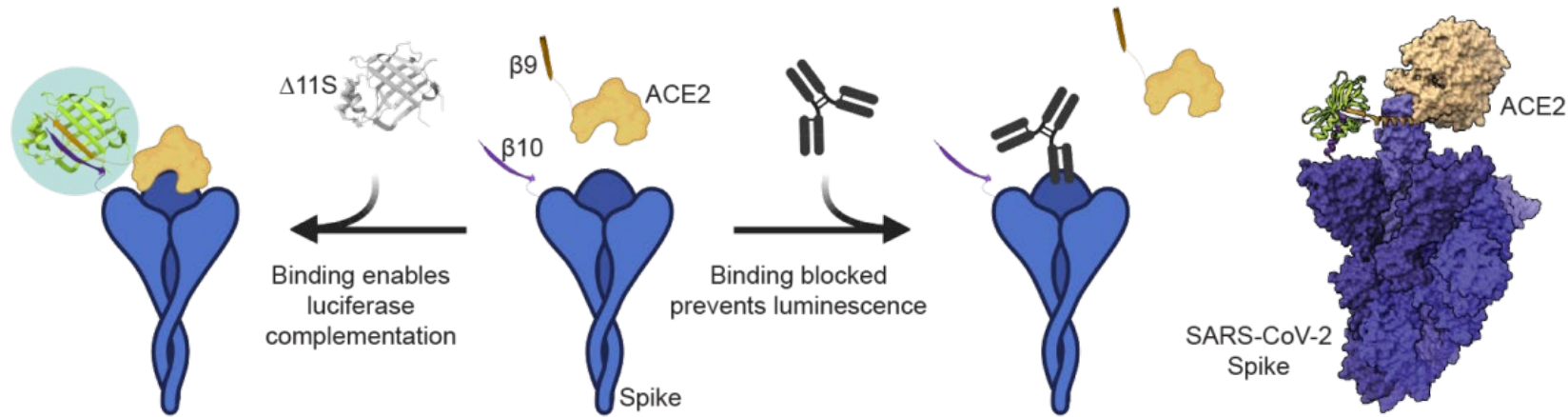
Owen Lab, University of Utah, College of Pharmacy Department of
Pharmaceutics and Pharmaceutical Chemistry

Sars-CoV-2 Infection and Tri-part NanoLuc® Systems



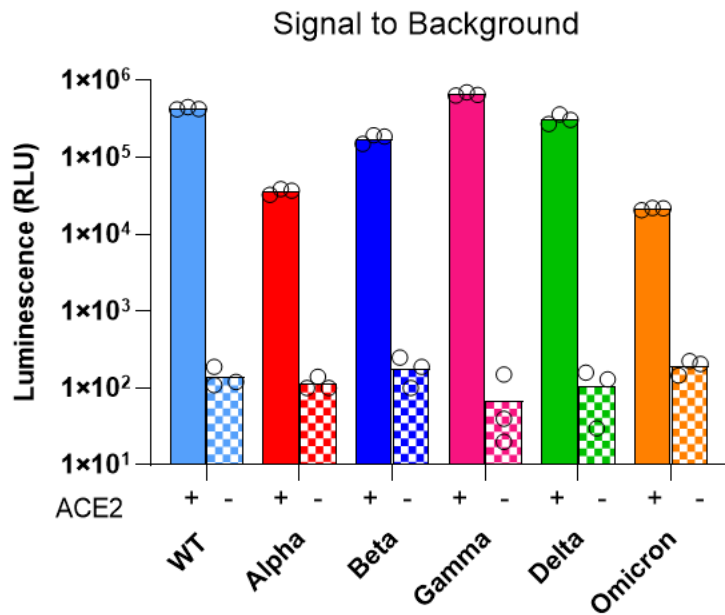
- The spike protein of Sars-CoV-2 associates with ACE2 receptor leading to viral entry into the cell
- The large fragment associates with the two beta strands to form an active enzyme

Homogenous Surrogate Virus Neutralization Assay

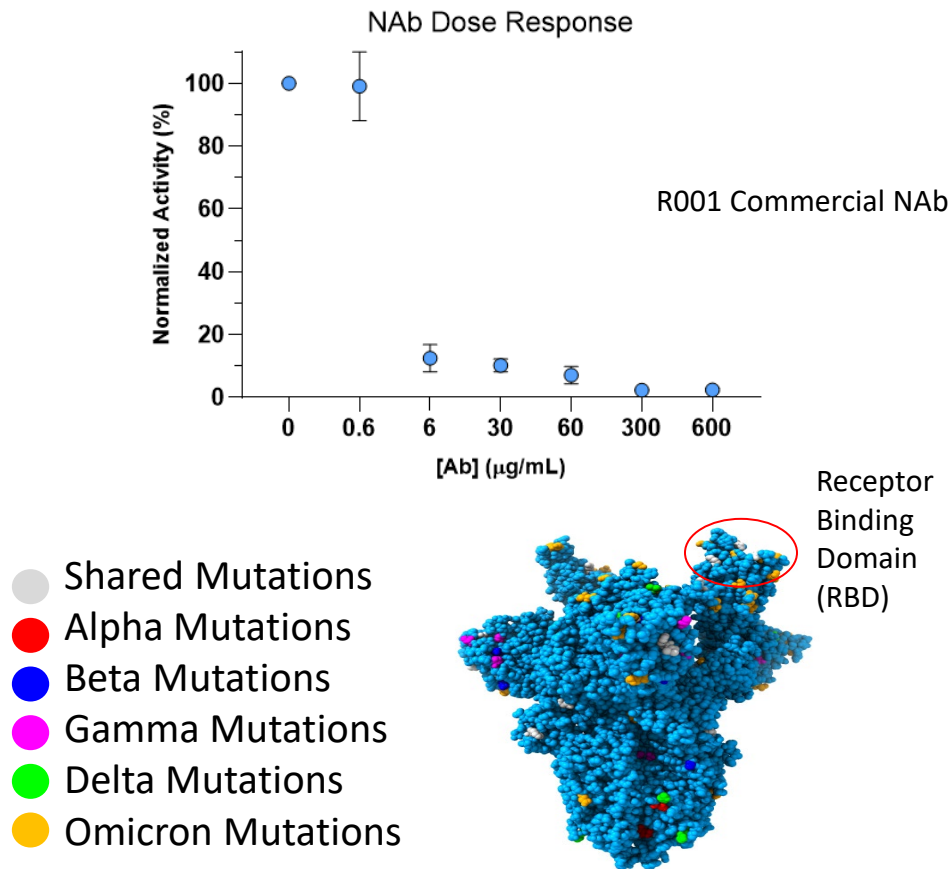


- Protein binding allows for refolding of NanoLuc® resulting in luminescence
- Neutralizing antibodies block Spike-ACE2 association resulting in a loss of signal

Validation of Variant Spike Protein Constructs

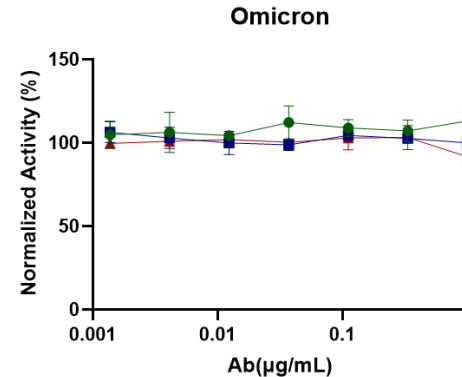
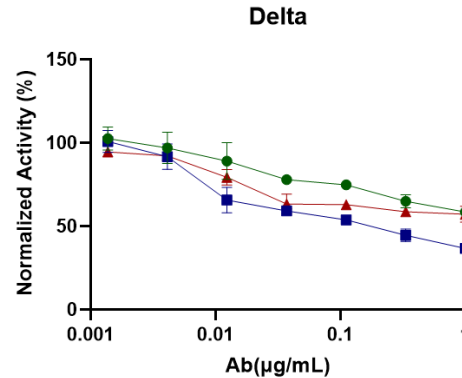
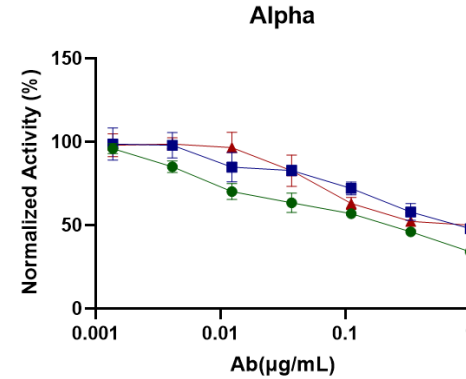
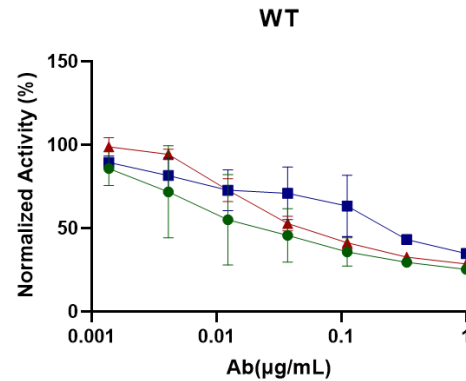
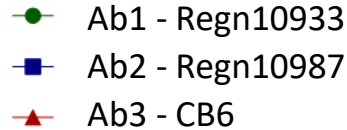


- Spike proteins complexes with ACE2 to give significant luminescence



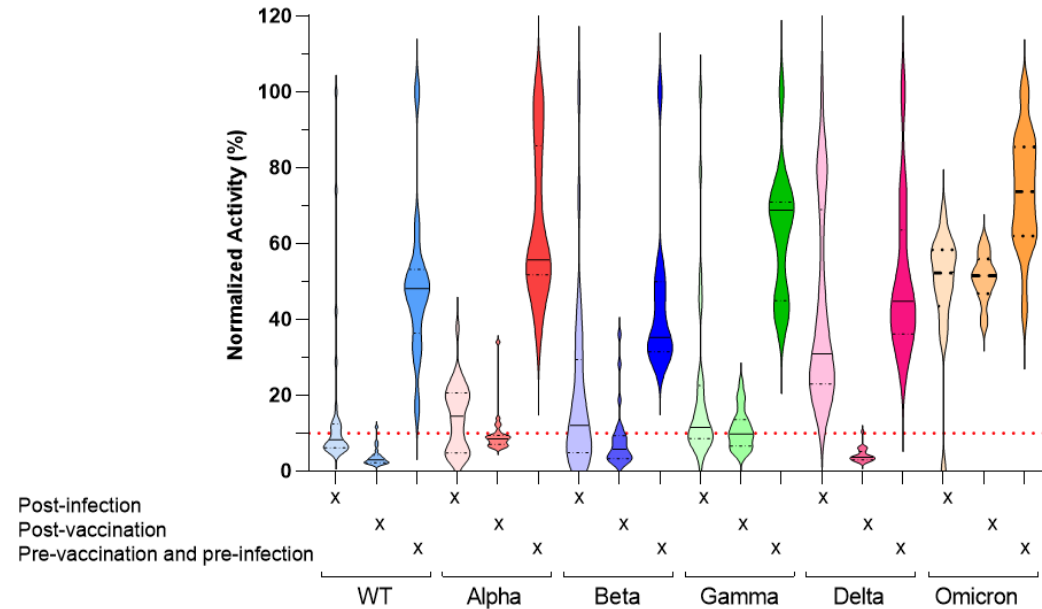
Activity of Commercial Neutralizing Antibodies

- Ab1 has the greatest activity against both WT and Alpha variants



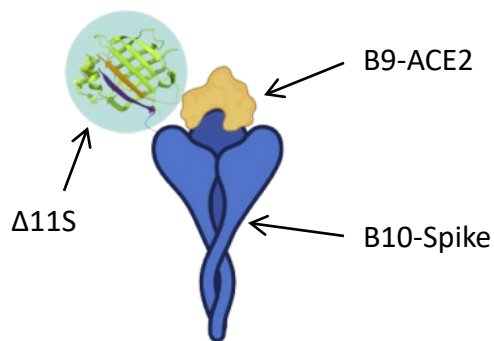
- Ab2 has the greatest activity against Delta but the no activity is seen for Omicron

Neutralizing Antibody Detection in Human Sera

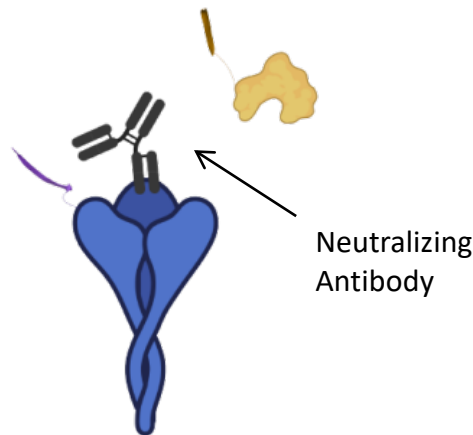


- Neutralizing antibodies are present in both vaccinated or infected samples
- Differences in neutralization are seen with different spike variants
- Virtually no neutralization is seen for Omicron variant

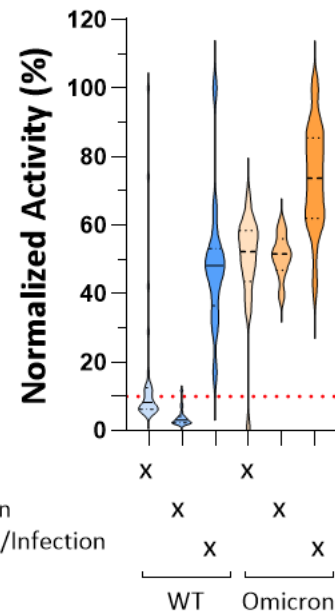
Summary



Tri-Part NanoLuc® system allows for detection of neutralizing antibodies in human serum



Commercial neutralizing antibodies have different activity against the spike proteins variants



Neutralizing antibody efficacy changes with the different variant spike proteins

Acknowledgments

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Funding and Samples



Questions??

Email

Morgan.Marsh@utah.edu

LinkedIn

