



# Coronavirus Research Made Accessible

## Spike-Pseudotyped Lentivirus and More for Coronavirus Binding and Neutralization Studies

The public health crisis resulting from the COVID-19 pandemic has made clear the critical need to improve understanding of pathogenic coronaviruses such as SARS-CoV-2 and MERS-CoV. Currently, most research on these viruses can only be carried out in Biosafety Level 3 (BSL-3) labs. To provide more researchers the ability to study these viruses, Cellalecta has developed a line of products based on pseudotyping lentivirus with coronavirus Spike proteins which makes possible their use in BSL-2 facilities.

## Spike-Protein Pseudotyped Lentiviral Particles

The Spike protein (S-protein) mediates coronavirus binding and infection. Lentiviral particles carrying a reporter, such as GFP or luciferase, and pseudotyped with a coronavirus Spike protein (S-protein), will bind to the same cellular receptor as the native coronavirus and introduce the reporter into the target cell. (Figure 1).

As a result, Spike-protein pseudotyped lentivirus enables researchers in typical BSL-2 laboratories to conveniently investigate how antibodies, compounds, or other factors might neutralize binding and infectivity of the virus.

## Coronavirus Binding Assay Products

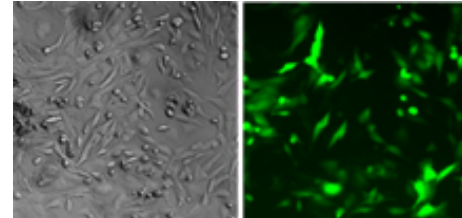
Cellalecta offers a range of products for developing and running Spike-protein neutralization assays with pseudotyped lentiviral particles (Figure 2).

- **Spike-protein-pseudotyped lentiviral particles** with fluorescent protein or luciferase reporters.
- **Vectors and systems to package** your own reporters or other genes as Spike-pseudotyped lentivirus.
- **Cell lines** engineered to express the receptor protein binding target (i.e., ACE2 for SARS and DPP4 for MERS).
- **Packaged lentivirus** expressing the Spike-receptor protein to make responsive cell lines for the binding assay.
- **Antibodies** to Spike and related coronavirus proteins.

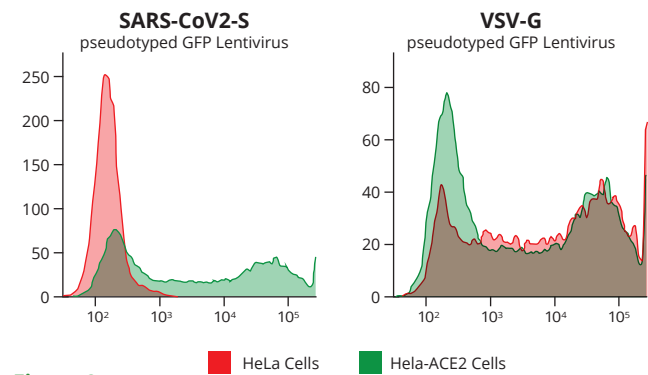
## Applications

Binding and neutralization assays with Spike-pseudotyped lentivirus provide a scalable, BSL-2 compatible method to test compounds, antibodies, and other factors that may affect coronavirus binding and infection. Access to pseudotyped lentiviral reagents and responsive cells enables the following types of studies: (Figure 3):

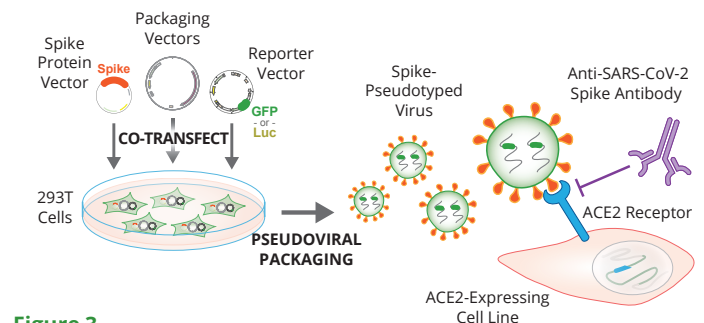
- **Screens** of compound, antibodies, or other factors for inhibition or agonistic effects on Spike protein binding.



**Figure 1**  
ACE2-HeLa cells transduced with SARS-CoV2-S pseudotyped lentivirus.



**Figure 2**  
**Left:** Shift shows increase in fluorescent ACE2-HeLa cells transduced with Spike-protein pseudotyped lentiviral particles as compared with unmodified HeLa cells. **Right:** Both ACE2-expressing and standard HeLa cells transduce with the broadly tropic VSV-G pseudotyped lentivirus.



**Figure 3**

- **Tests** of how mutational variants of the Spike protein or receptor affect viral binding efficacy.
- **Quantification** of how binding and infection rates change with a change of the ratio of virus to cells, cellular receptor levels, or other parameters.

## Ordering Information

Catalog #	Description	Quantity			
RSCOV-SG-2	SARS-CoV-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RMCOV-SL-50	MERS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Dpp4 Cells)	50 mls (10 <sup>5</sup> TU/ml)
RSCOV-SG-10	SARS-CoV-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RVSV-GL-2	VSV-G Pseudotyped Luc Lentivirus (titered in HeLa Cells)	2mls (10 <sup>5</sup> TU/ml)
RSCOV-SG-50	SARS-CoV-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RVSV-GL-10	VSV-G Pseudotyped Luc Lentivirus (titered in HeLa Cells)	10 mls (10 <sup>5</sup> TU/ml)
RSCOV2-SG-2	SARS-CoV2-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RVSV-GL-50	VSV-G Pseudotyped Luc Lentivirus (titered in HeLa Cells)	50 mls (10 <sup>5</sup> TU/ml)
RSCOV2-SG-10	SARS-CoV2-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RSCOV-SPACK	SARS-CoV-S Pseudotyped Lentiviral Packaging Mix (enough for ~12 10-cm2 plates to make ~1-2 x 10 <sup>7</sup> TU)	250 ug
RSCOV2-SG-50	SARS-CoV2-S Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSCOV2-SPACK	SARS-CoV2-S Pseudotyped Lentiviral Packaging Mix (enough for ~12 10-cm2 plates to make ~1-2 x 10 <sup>7</sup> TU)	250 ug
RSCOV2-SDGG-2	SARS-CoV2-S-D614G Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RSCOV2-SDGPACK	SARS-CoV2-S-D614G Pseudotyped Lentiviral Packaging Mix (enough for ~12 10-cm2 plates to make ~1-2 x 10 <sup>7</sup> TU)	250 ug
RSCOV2-SDGG-10	SARS-CoV2-S-D614G Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RMCOV-SPACK	MERS-CoV-S Pseudotyped Lentiviral Packaging Mix (enough for ~12 10-cm2 plates to make ~1-2 x 10 <sup>7</sup> TU)	250 ug
RSCOV2-SDGG-50	SARS-CoV2-S-D614G Pseudotyped GFP Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSCOV-CACE2HE	HeLa-ACE2 Cells (for SARS-CoV-S, SARS-CoV2-S, SARS-CoV2-S-D614G assays)	10 <sup>6</sup> cells
RMCOV-SG-2	MERS-CoV-S Pseudotyped GFP Lentivirus (titered in HeLa-Dpp4 Cells)	2mls (10 <sup>5</sup> TU/ml)	RSCOV-CACE2U2	U2OS-ACE2 (for SARS-CoV-S and SARS-CoV2-S, SARS-CoV2-S-D614G assays)	10 <sup>6</sup> cells
RMCOV-SG-10	MERS-CoV-S Pseudotyped GFP Lentivirus (titered in HeLa-Dpp4 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RMCOV-CDPP4HE	HeLa-DPP4 (for MERS-CoV-S assays)	10 <sup>6</sup> cells
RMCOV-SG-50	MERS-CoV-S Pseudotyped GFP Lentivirus (titered in HeLa-Dpp4 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RMCOV-CDPP4U2	U2OS-DPP4 (for MERS-CoV-S assays)	10 <sup>6</sup> cells
RVSV-GG-2	VSV-G Pseudotyped GFP Lentivirus (titered in HeLa Cells)	2mls (10 <sup>5</sup> TU/ml)	RSVACE2-P	Lentivirus Expressing human ACE2 Gene with BlastR (plasmid)	25 ug
RVSV-GG-10	VSV-G Pseudotyped GFP Lentivirus (titered in HeLa Cells)	10 mls (10 <sup>5</sup> TU/ml)	RSVACE2-V	Lentivirus Expressing human ACE2 Gene with BlastR (virus)	10 <sup>7</sup> TU
RVSV-GG-50	VSV-G Pseudotyped GFP Lentivirus (titered in HeLa Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSVDPP4-P	Lentivirus Expressing human DPP4 Gene with BlastR (plasmid)	25 ug
RSCOV-SL-2	SARS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RSVDPP4-V	Lentivirus Expressing human DPP4 Gene with BlastR (virus)	10 <sup>7</sup> TU
RSCOV-SL-10	SARS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RSCOV-ABHS-C10005	Human anti-SARS-CoV and CoV2 Spike antibody [CR3022]	100 ug
RSCOV-SL-50	SARS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSCOV-ABMS-C10006	Mouse anti-SARS-CoV-2 Spike mAb, Clone LGSV201	100 ug
RSCOV2-SL-2	SARS-CoV2-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RSCOV-AB-GHN-C10004	Human anti-SARS-CoV and CoV2 NP Antibody (IgG)	100 ug
RSCOV2-SL-10	SARS-CoV2-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RSCOV-ABAHN-C10007	Human anti-SARS-CoV and CoV2 NP Antibody (IgA)	50 ug
RSCOV2-SL-50	SARS-CoV2-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSCOV-AB-MHN-C10008	Human anti-SARS-CoV and CoV2 NP Antibody (IgM)	50 ug
RSCOV2-SDGL-2	SARS-CoV2-S-D614G Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	2mls (10 <sup>5</sup> TU/ml)	RCOV-NP-C11002	MERS-CoV Nucleocapsid Protein, His-SUMO-tag, HEK293	100 ug
RSCOV2-SDGL-10	SARS-CoV2-S-D614G Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	10 mls (10 <sup>5</sup> TU/ml)	RSCOV-NP-C11003	SARS-CoV Nucleocapsid Protein, His-SUMO-tag, HEK293	100 ug
RSCOV2-SDGL-50	SARS-CoV2-S-D614G Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Ace2 Cells)	50 mls (10 <sup>5</sup> TU/ml)	RSCOV2-NP-C11004	SARS-CoV2 Nucleocapsid Protein, His-SUMO-tag, HEK293	100 ug
RMCOV-SL-2	MERS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Dpp4 Cells)	2mls (10 <sup>5</sup> TU/ml)	RSCOV2-NPC-C11005	SARS-CoV2 Nucleocapsid Protein, E. coli	100 ug
RMCOV-SL-10	MERS-CoV-S Pseudotyped Luc Lentivirus (titered in Collecta HeLa-Dpp4 Cells)	10 mls (10 <sup>5</sup> TU/ml)			