

## SARS-CoV-2 Pseudoviral Particles, Beta Variant (South Africa B.1.351)

CATALOG NUMBER: SCV2-PsV-SA, 5 mL

### Description

It has been known that SARS coronavirus 2 (SARS-CoV-2) uses human ACE2 as entry receptor and human proteases as entry activators. The virus surface spike protein (S) mediates SARS-CoV-2 entry into cells. To fulfill its function, SARS-CoV-2 spike binds to its human ACE2 (hACE2) receptor through its receptor-binding domain (RBD) and is proteolytically activated by human proteases.

Our **SARS-CoV-2-SA Pseudoviral Particles** are replication-deficient MLV pseudotyped with the SARS-CoV-2 spike protein of the beta variant (also known as South Africa B.1.351, 20H/501Y.V2 formerly 20C/501Y.V2) (GISAID sequence accession # EPI\_ISL\_736980). They also contain the ORF for firefly luciferase as a reporter. They establish a pseudovirus cell entry assay mediated by the SARS-CoV-2 spike protein that can be conveniently measured via luciferase reporter activity. This pseudovirus assay isolates the SARS-CoV-2 viral entry from other steps of the viral infection cycle.

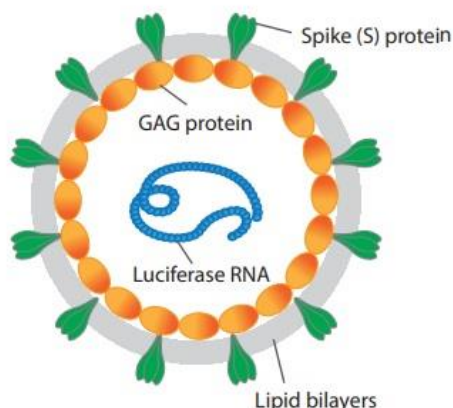


Figure 1. Illustration of the replication-deficient MLV particle pseudotyped with SARS-CoV-2 Spike protein

### Reference:

*Emergence and rapid spread of a new severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) lineage with multiple spike mutations in South Africa.*

<https://www.medrxiv.org/content/10.1101/2020.12.21.20248640v1.full>

### Applications

Our Pseudovirus Particles generate robust chemiluminescent signals in cell assays when coupled with our firefly luciferase assay kit (Catalog # [CA-L165](#)), useful for 1) screening potential inhibitor to block SARS-CoV-2 entry and viral protein translation; 2) measuring the activity of and screening for neutralizing antibody against SARS-CoV-2-SA (refer to [the Neutralization Assay Application Note](#)).

### Features

**Robust:** Excellent signal to noise (basal) ratio

**Easy to use:** Amenable to HTS format (96-well, 384-well and 1536-well format)

### Contents

5 ml, for one multi-well plate; PP per mL > 1.0E+07

### Storage

Upon receiving this item, store at -70 °C right away. Thaw\* before immediate use.

**\*Note: read the instruction for thawing in the following protocol carefully. Do not aliquot and refreeze.**

### Shelf Life:

Six months from the date of shipping when store at -70 °C

**ASSAY PROTOCOL**

**Note:** requires a luciferase assay reagent (Catalog # [CA-L165](#)).

**Cell Infection:**

1. Count HEK293-ACE2 cells (Catalog # [CL-hACE2-002](#)) to be infected and seed ~20K cells per well into 96-well plates (50 µl per well) DMEM with 10% HyClone™ FetalClone™ II Serum (no antibiotics) or 5K cells per well into 384-well plates (15 µl per well).
2. Culture cells overnight to make sure the cells stably adhere to the plates.
3. On the 2<sup>nd</sup> day, remove media, add 50 µl SARS-CoV-2-SA Pseudoviral Particles\* into each well (12.5 µl for 384-well plate). Spin at 700 rpm for 15 min at 4°C.

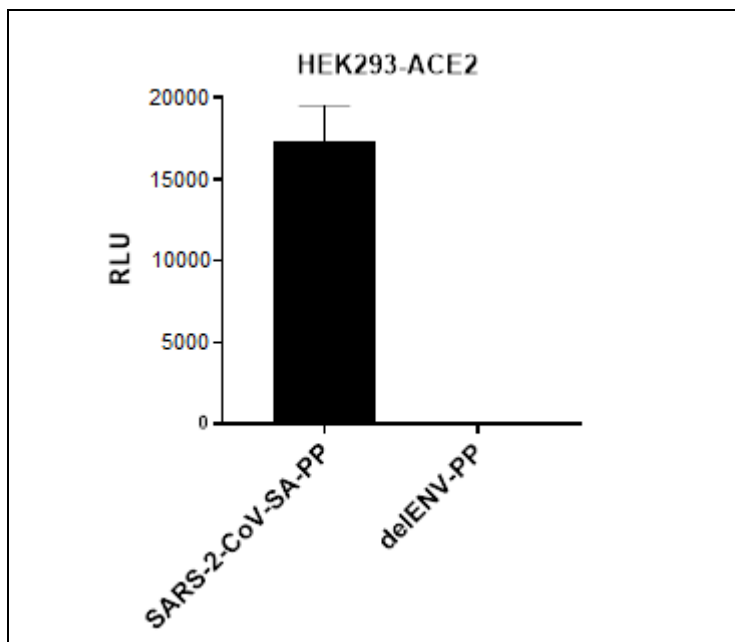
**\*Note: thaw the pseudoviral particles quickly in the room temperature water (< 30 minutes, do not shake) and use right away. Discard the unused portion (do not re-freeze or leave it on ice for later use).**

4. Incubate for 2 hrs at 37 °C.
5. Add 50 µl DMEM with 10% FC into each well (12.5 µl for 384-well plates).
6. Incubate for 42 hrs at 37 °C.

**Measurement of Luciferase Activity in Infected Cells**

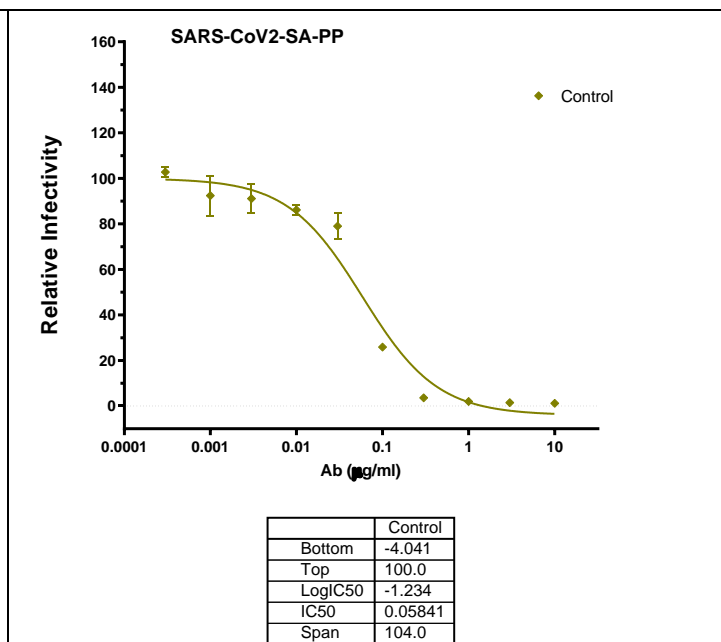
1. Do not remove medium. Add 100 µl eEnzyme’s luciferase assay WORKING SOLUTION (25 µl for 384-well plate) directly into each well. Refer to the protocol of “Firefly Luciferase Assay Kit” (eEnzyme Cat.# CA-L165).
2. Read in a luminescence plate reader and record the data.

**Data Analysis**



**Figure 2. Pseudoviral Particle (PP) Infection Assays**  
SARS-CoV-2-SA variant pseudoviral particles on HEK293-ACE2 cells in 384-well format (Luminescence plate reader: PerkinElmer WALLAC VICTOR<sup>2</sup> 1420 Multilabel Counter)

**Legends:** **SARS-2-CoV-SA-PP:** SARS-CoV-2-SA variant MLV pseudovirus particles (SCV2-PsV-SA)  
**delENV-PP:** MLV control (w/o envelope spike protein) (Catalog # [PsV-001](#))



**Figure 3. SARS-CoV-2 Viral Infection Inhibiting Test by Neutralization Antibodies.**  
HEK293-ACE2 cells incubated with SARS-CoV-2 Beta Variant Pseudoviral Particles (Catalog # SCV2-PsV-SA) under various amount of neutralizing antibody.  
**Legend:** **SARS-CoV2-SA-PP,** SARS-CoV-2 Beta variant pseudoviral particles (Catalog # SCV2-PsV-SA)  
“Control”, neutralizing antibody used in this viral infection inhibition assay, [SCV2-SA-11m](#).