Product Specification Sheet

Product Name	**Luciferase-GFP Spike (SARS-CoV-2) Pseudotyped Lentivirus**
Description	The Spike (SARS-CoV-2) pseudotyped lentivirus was produced with SARS-CoV-2 Spike protein as the envelope glycoprotein instead of vesicular stomatitis G (VSV-G) envelope glycoprotein. These pseudo-viruses also contain Luciferase gene driven by CMV promoter and GFP-T2A-puro driven by EF1α promoter, therefore, the spike-mediated cell entry can be conveniently quantified by luciferase activity and visualized under a fluorescent microscope. The Spike (SARS-CoV-2) pseudotyped lentivirus can be used for studying basic mechanisms and drug development including measuring the activity of neutralizing antibody against SARS-CoV-2, and screening anti-CoV2 drugs in a Biosafety Level 2 facility.
Catalog No.	SV11
Size	5 x 20 µl, concentrated
IFU	~$5X10^6$ IFU/ml
Effector Cell	Cell with hACE2 expression (Cat# AL01)
Shipping Condition	Dry Ice
Storage and Stability	Store at -80°C
Restricted Use	For Research Use Only. Not for use in diagnostic or therapeutic procedures.
Safety Precaution	Biosafety Level: BSL-2 It is the responsibility of the principal investigator to seek Institutional Biosafety Safety Committee approval for recombinant DNA, transgenic animal or infectious agent use within their laboratory spaces and maintain an Institutional Biosafety Safety Committee approval during the time period these materials are used.

ALSTEM CELL ADVANCEMENTS

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Luciferase-GFP Spike (SARS-CoV-2) Pseudotyped Lentivirus

Background

The pandemic coronavirus disease 2019 (COVID-19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Infection of SARS-CoV-2 to human cells is initiated by the binding of its Spike protein to ACE2 (angiotensin converting enzyme 2), a homodimer receptor, on the surface of some human cells, particularly those in the respiratory tract. The Spike protein promotes attachment of ACE2 to the subunit S1 and its RBD (Receptor Binding Domain) region, facilitates fusion of the viral and cellular membrane releasing the virus core into the cell. Therefore, drugs targeting the interaction between the Spike protein of SARS-CoV-2 and ACE2 may offer protection against the viral infection. Due to the highly transmissible and pathogenic nature of SARS-CoV-2, handling of live virus requires a biosafety level 3 (BSL3) containment. In order to extend this capability to BSL-2, a high titer pseudotype virus is needed to meet such requirement that effectively replaces the need for the live SARS-CoV-2.

Product Description

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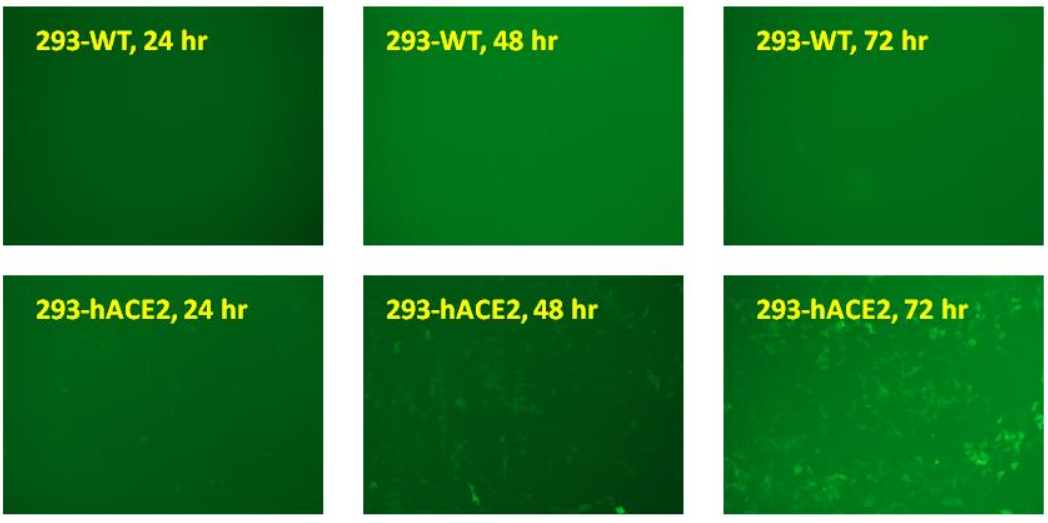

Luciferase pseudotyped lentivirus assay. GFP expression was detected in HEK293-hACE2 cells as early as 24 hours after transduction by Luciferase Spike (SARS-CoV-2) pseudotyped lentivirus while no GFP expression was detected in HEK293 WT cells. Strong GFP expression can be observed in HEK293-hACE2 cells 48-72 hours post-transduction. This infectivity of ALSTEM pseudotyped lentivirus is significantly higher than what has been reported in the literature[1].

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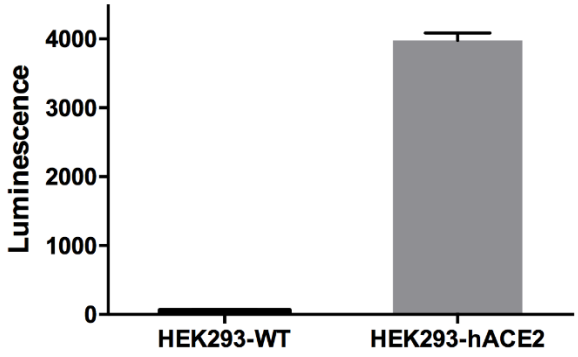
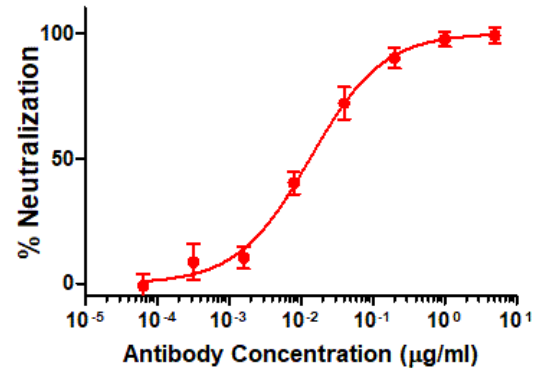


Luciferase assay. Transduction of HEK293-hACE2 cells and HEK293 wild type using Luciferase Spike (SARS-CoV-2) Pseudotyped Lentivirus.



Antibody neutralization assay. Luciferase Spike (SARS-CoV-2) Pseudotyped Lentivirus was incubated with anti-SARS-CoV-2 spike protein antibodies (ALSTEM, SAb-401.1, Cat# COV2S41) and subsequently inoculated onto HEK293-hACE2 cells (ALSTEM, Cat# AL01) to evaluate cross-neutralization potential. The antibody against SARS-CoV-2 spike protein is able to effectively inhibit the infection of pseudovirus to the target cells (IC_{50} = 16.2 ng/ml).

Applications for Spike (SARS-CoV-2) pseudotyped lentivirus:

- Vaccine development for prevention of infection by SARS-CoV-2 virus
- Studying the efficacy and mechanism of neutralizing antibodies against SARS-CoV-2 virus
- Development of anti-coronavirus therapeutic agents
- Studying the mechanism of virus-receptor interaction

A protocol for antibody neutralization assay is available online.

Other related Spike (SARS-CoV-2) pseudotyped lentivirus and cell line:

GFP Spike (SARS-CoV-2) pseudotyped lentivirus, Cat# SV01
HEK293-hACE2 cell line, Cat# AL01

Literature:

1. Crawford, K.H.D., et al., Viruses, 2020. 12(5).

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