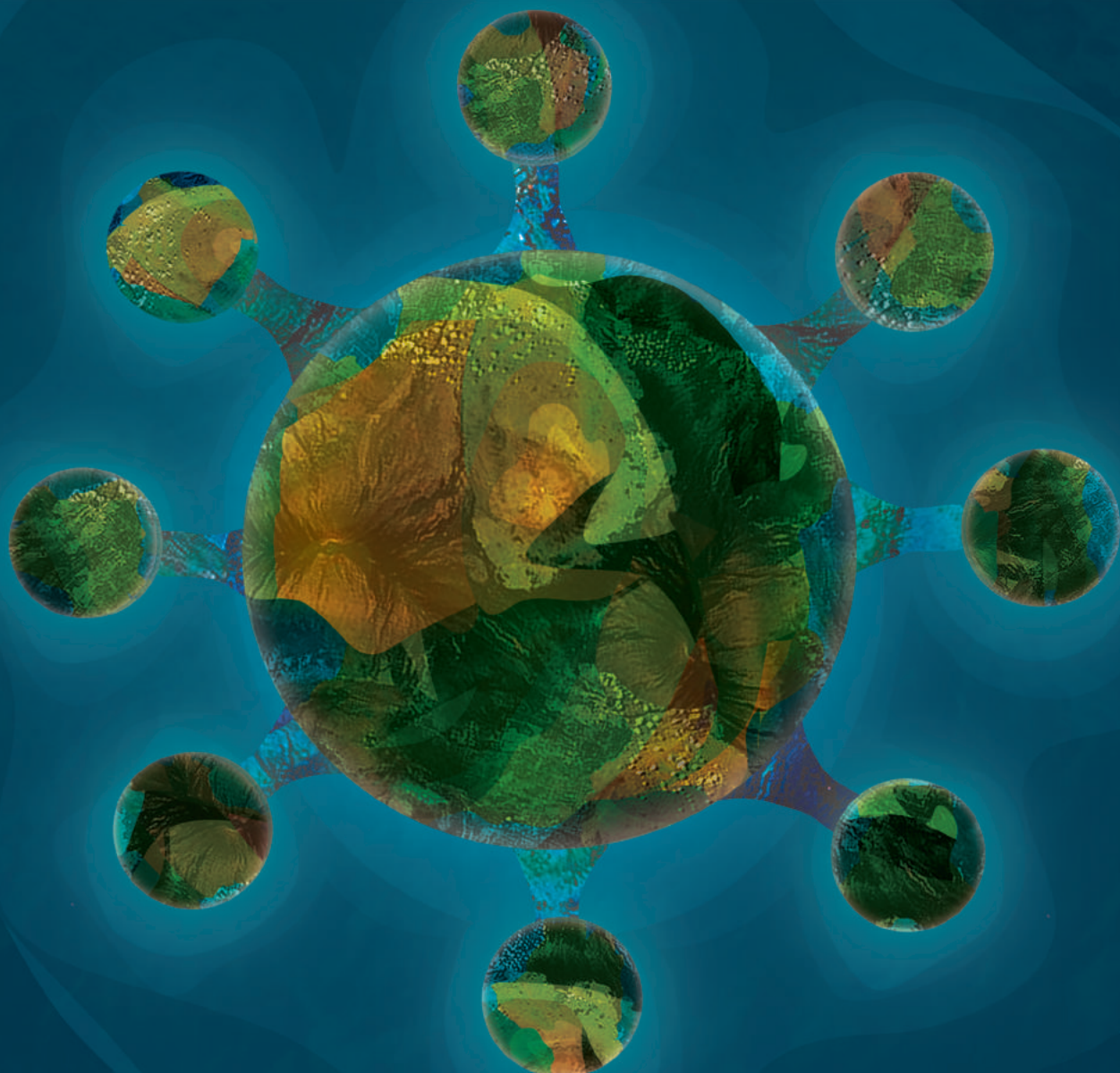
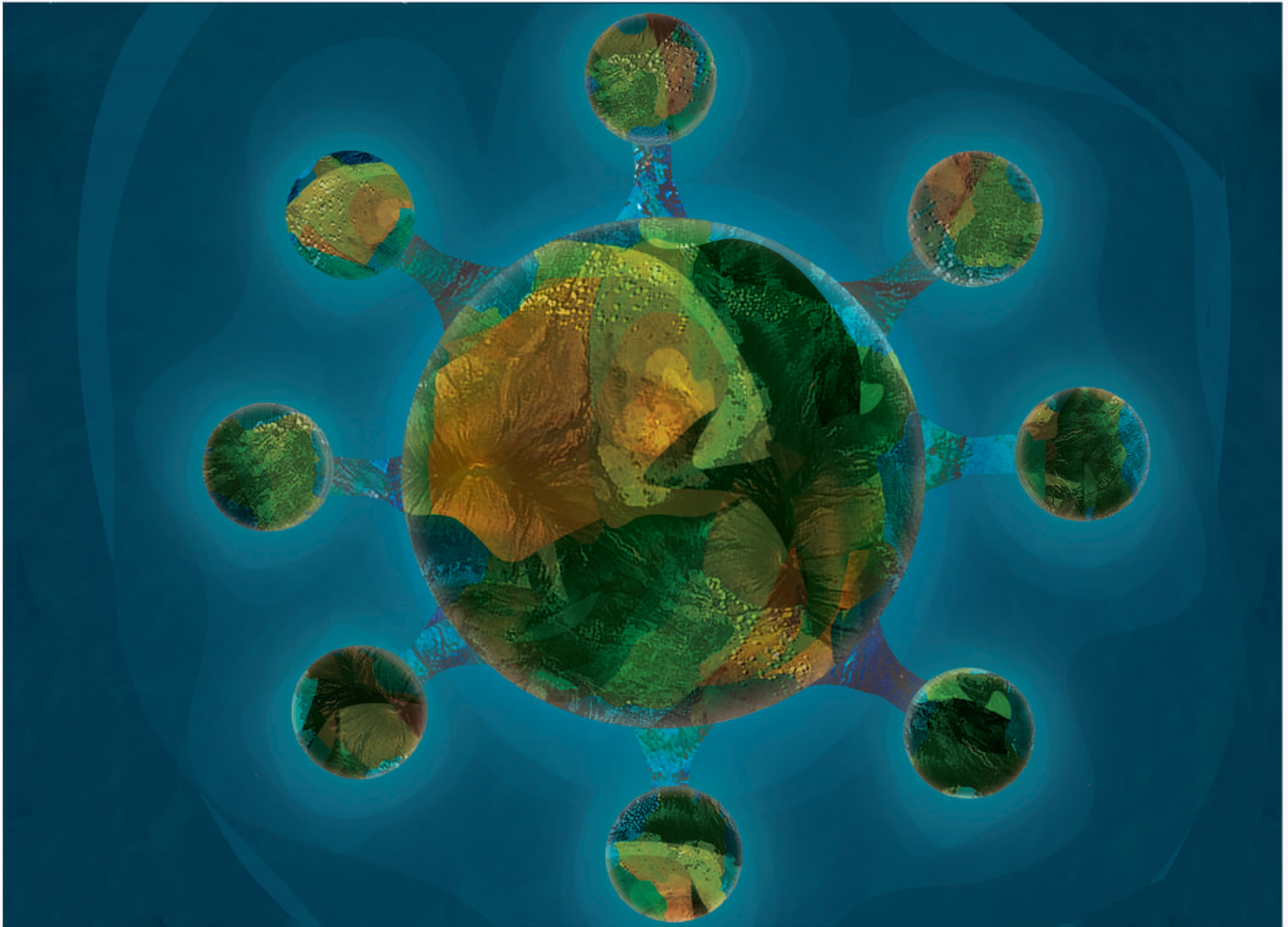


LENTIVIRUSES

CAR-T | Coronavirus | Immunotherapy | CRISPR | Custom Services

GENE KNOCKDOWN,
PROTEIN EXPRESSION,
CELL LINE GENERATION





Ready-to-use Viral Particles

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BPS Bioscience Advantages

Scientist Founded, Scientist Driven



Produced In-house



- Made in the USA at our San Diego, California laboratory
- Get customized, personal support directly from the source

Expansive Portfolio



- Choose from ready to use lentiviruses to study CAR-T, cell signaling pathways, coronavirus, CRISPR, and immunotherapy
- Long-term stable expression of a transgene with low immunogenicity, low toxicity, and transduction efficiencies can be extremely high (up to 100%)

Custom Services

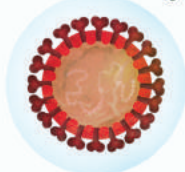


- Design a custom lentivirus with reporters and selection markers of your choice
- Utilize BPS's cell line development services to generate overexpression and reporter cell lines
- Generate knock-out/knock-in cell lines or integrating/non-integrating lentiviruses

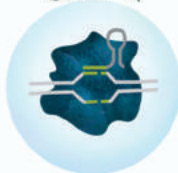
Lentivirus Products

Research Areas

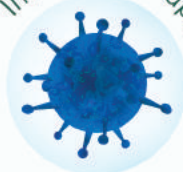
Coronavirus



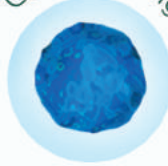
CRISPR



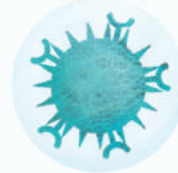
Immunotherapy



Cell Signaling



CAR-T



Advantages

- Can infect both actively-dividing and non-dividing cells
- Can infect a wide range of cell stages
- Ideal for transducing primary cells or stem cells
- Size of inserted DNA can be up to 10 kb
- Long-term stable expression of a transgene
- Low immunogenicity, low toxicity
- Transduction efficiencies can be extremely high (up to 100%)

Applications

- Stable cell line generation
- Protein expression or protein knockout
- Detection method for biochemical assays and reporter assays (GFP, luciferase)
- Screen for neutralizing antibodies
- Study the mechanism of viral transduction

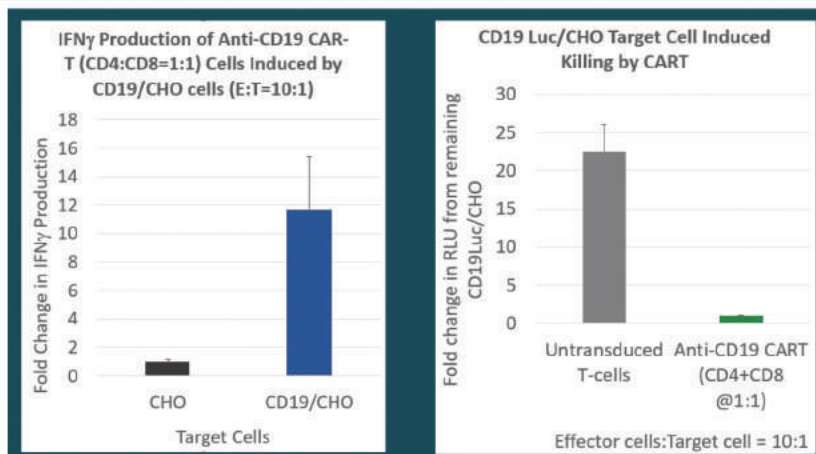
Example Data

Anti-CD19 CAR Lentivirus

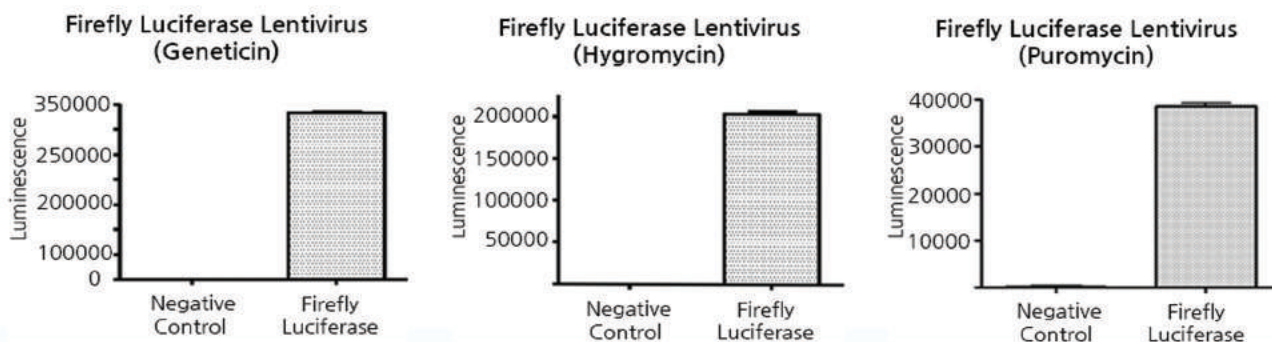
Transfection of primary T cells or Jurkat reporter cell line for engineering or validation (specificity, efficacy, potency)

Evaluate CAR-T therapeutic potential

BPS Bioscience #79851



Firefly Luciferase Lentivirus (G418, Hygromycin and Puromycin) - BPS Bioscience #79692



Lentivirus Products - Coronavirus

Options



Reporters
eGFP
Luciferase
Dual (Luc & eGFP)

Cell Types
Hela
CHO
HEK293
Vero E6

Variants & Mutants
D614G
B.1.1.7
B.1.351
P.1
B.1.427
& more

Advantages
Off-the-shelf
BSL2 safety level
Multiple Mutants
Use with reporter cell lines

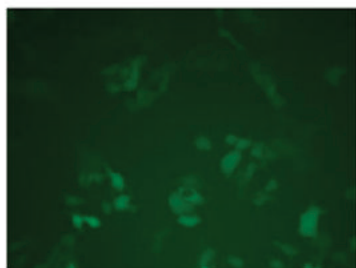
Uses and Advantages

- Study the mechanism of viral transduction
- Screen for neutralizing antibodies for SARS-CoV-2 Spike and ACE2
- ACE2, Spike, TMRPSS2, and Bald lentiviruses available with different reporters
- Mutated Lentiviruses: D614G, K417T, E484K, N501Y, & more
- SARS-CoV-2 Variant Lentiviruses: B.1.1.7, B.1.351, P.1, & more
- Wild-type and variant Spike protein used as ENV for lentivirus infection
- Reporter eGFP and/or Luciferase under the control of a CMV promoter (constitutive expression)
- Bald virus available (control: no VSV-G or Spike)
- High Titer

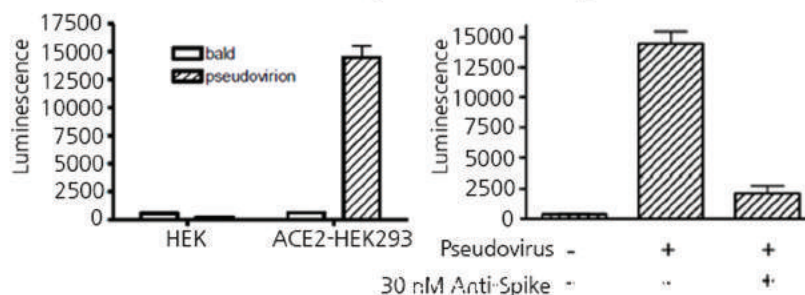
Example Data

Spike (SARS-CoV-2) Pseudotyped Lentivirus (Luc-eGFP Dual Reporter) - BPS Bioscience #79982

Transduction of ACE2-HEK293 Cells Monitored by eGFP Expression



Transduction of ACE2-HEK293 Monitored by Luciferase Activity



Lentivirus Products - CRISPR



The CRISPR Lentiviruses are replication incompetent, HIV-based VSV-G pseudotyped lentiviral particles that are ready to be transduced into almost all types of mammalian cells, including primary and non-dividing cells. These particles contain a CRISPR/Cas9 gene driven by an EF1a promoter, along with 4 validated sgRNA (single guide RNA) targeting your gene of interest, driven by a U6 promoter.

Integrating dCas9-VP64 and MS2-P65-HSF1 Lentiviruses

- Transduce into almost all types of mammalian cells, including primary and non-dividing cells
- Particles contain the genes for dCas9-VP64 (with blasticidin resistance) and MS2-P65-HSF1 (with hygromycin resistance)

Integrating sgRNA MS2 Activating Lentiviruses

- Contain 4 validated sgRNA (single guide RNA) targeting the promoter region of your gene of interest, fused to MS2 and driven by a U6 promoter
- Ready-to-transduce into your dCas9-VP64 and P65-HSF1-MS2 expressing cell lines to stably activate expression of your gene of interest

| Integrating | Non-Integrating |
|--|--|
| Contains the wild-type integrase | Integrase-deficient |
| Integrates randomly into the cell's genome to stably express both the Cas9 and sgRNA | Generates only transient expression of the Cas9 and sgRNA |
| Puromycin selection increases the knock-out efficiency by ensuring high expression levels of both Cas9 and the sgRNA | Prolonged puromycin selection is not required |
| Generates higher knock-out efficiencies in a cell pool | Limited dilution is required because the overall percentage of knock-outs may be lower |
| Has a potentially higher risk of off-targeting due to random integrations into other genes | Eliminates risk of off-targeting due to random viral integrations |

Custom Lentivirus & Cell Line Services

- Utilize BPS's services for a custom lentivirus generated for your research needs
- Customize your lentivirus and cell line with reporters, selection markers, variants, and mutations
- Generate custom overexpression and reporter cell lines using your lentivirus
- Choose knock-out/knock-in cell lines or integrating/non-integrating lentiviruses

Project Milestones



1

Molecular Biology

BPS will generate lentiviral vectors using available image clones, or through the use of synthetic DNA



2

Lentivirus

The custom lentivirus is manufactured for the development of the stable cell line



3

Selection and Pool Generation

Parental cells will be transduced with lentivirus. The cell pool will be selected for using antibiotics.



4

Clonal Selection

Based on the results of the initial pool testing, the cell pool will be diluted and the single cell derived clone will be selected.



5

Confirmation of Expression

The expression level of the target protein will be analyzed via Western Blot or FACS.



6

Functional Validation

Cells will be treated with a reference control compound to obtain dose-response titration data.



7

Stability Testing

The desired number of clones will be selected for passage stability testing. Mycoplasma testing and cell banking services are also available.

Lentiviruses

Product Listing

| Lentiviruses | Catalog# | Size |
|--|----------|------------|
| ACE2 Lentivirus | 79944 | 500 µl x 2 |
| AP1 Luciferase Reporter Lentivirus (JNK Signaling Pathway) | 79823 | 500 µl x 2 |
| ARE Luciferase Reporter Lentivirus | 79869 | 500 µl x 2 |
| Bald Lentiviral Pseudovirion (eGFP Reporter) | 79987 | 500 µl x 2 |
| Bald Lentiviral Pseudovirion (Luc-eGFP Dual Reporter) | 79988 | 500 µl x 2 |
| Bald Lentiviral Pseudovirion (Luciferase Reporter) | 79943 | 500 µl x 2 |
| Cas9 Lentivirus (Hygromycin Selection) | 78067 | 500 µl x 2 |
| Cas9 Lentivirus (Puromycin Selection) | 78066 | 500 µl x 2 |
| CD47 CRISPR/Cas9 Lentivirus (Integrating) | 78056 | 500 µl x 2 |
| CD47 CRISPR/Cas9 Lentivirus (Non-Integrating) | 78063 | 500 µl x 2 |
| CRE/CREB Luciferase Reporter Lentivirus | 79580 | 500 µl x 2 |
| CTLA4 CRISPR/Cas9 Lentivirus (Integrating) | 78054 | 500 µl x 2 |
| CTLA4 CRISPR/Cas9 Lentivirus (Non-Integrating) | 78061 | 500 µl x 2 |
| Enhanced GFP Lentivirus (Puromycin) | 79979 | 500 µl x 2 |
| Expression Negative Control Lentivirus (G418 or Hygromycin or Puromycin) | 79902 | 500 µl x 2 |
| FcER1G Lentivirus | 79878 | 500 µl x 2 |
| FcGRIIB (CD32B) Lentivirus | 79877 | 500 µl x 2 |
| FcGRIIIA (CD16a) Lentivirus | 79876 | 500 µl x 2 |
| Firefly Luciferase Lentivirus (G418, Hygromycin and Puromycin) | 79692 | 500 µl x 2 |
| Firefly Luciferase Lentivirus (UbC Promoter) | 79880 | 500 µl x 2 |
| Firefly Luciferase-eGFP Lentivirus (G418) or (Puromycin) | 79980 | 500 µl x 2 |
| IL-2 Promoter Luciferase Reporter Lentivirus | 79825 | 500 µl x 2 |
| IL-8 Promoter Luciferase Reporter Lentivirus | 79827 | 500 µl x 2 |
| ISRE Luciferase Reporter Lentivirus (JAK/STAT Signaling Pathway) | 79824 | 500 µl x 2 |
| LAG3 CRISPR/Cas9 Lentivirus (Integrating) | 78053 | 500 µl x 2 |
| LAG3 CRISPR/Cas9 Lentivirus (Non-Integrating) | 78060 | 500 µl x 2 |
| Negative Control eGFP Reporter Lentivirus | 79927 | 500 µl x 2 |
| Negative Control Luciferase Lentivirus | 79578 | 500 µl x 2 |

| Lentiviruses | Catalog# | Size |
|--|----------|--------------------------------|
| NF-κB eGFP Reporter Lentivirus | 79926 | 500 µl x 2 |
| NF-κB Luciferase Reporter Lentivirus | 79564 | 500 µl x 2 |
| NFAT eGFP Reporter Lentivirus | 79922 | 500 µl x 2 |
| NFAT Luciferase Reporter Lentivirus | 79579 | 500 µl x 2 |
| Non-secreted Gaussia Luciferase Lentivirus (CMV Promoter) | 79893-C | 500 µl x 2 |
| PD-1 CRISPR/Cas9 Lentivirus (Integrating) | 78052 | 500 µl x 2 |
| PD-1 CRISPR/Cas9 Lentivirus (Non-Integrating) | 78059 | 500 µl x 2 |
| PD-L1 CRISPR/Cas9 Lentivirus (Integrating) | 78057 | 500 µl x 2 |
| PD-L1 CRISPR/Cas9 Lentivirus (Non-Integrating) | 78064 | 500 µl x 2 |
| Renilla Luciferase Lentivirus (G418 or Puromycin) | 79565 | 500 µl x 2 |
| SBE Luciferase Reporter Lentivirus (TGFβ/SMAD Pathway) | 79806 | 500 µl x 2 |
| Secreted Gaussia Luciferase Lentivirus CMV Promoter or EF1a Promoter | 79892 | 500 µl x 2 |
| Spike (B.1.1.7 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter) | 78158 | 100 µl 500 µl x 2 |
| Spike (B.1.1.7 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter) | 78112 | 100 µl 500 µl x 2 |
| Spike (B.1.351 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter) | 78160 | 100 µl 500 µl x 2 |
| Spike (B.1.351 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter) | 78142 | 100 µl 500 µl x 2 |
| Spike (B.1.429 Variant) Pseudotyped Lentivirus (Luc Reporter) | 78172 | 100 µl 500 µl x 2 |
| Spike (D614G) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter) | 78035 | 100 µl 500 µl x 2 |
| Spike (D614G) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter) | 78028 | 100 µl, 500 µl x 2 |
| Spike (K417T, E484K, N501Y) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter) | 78143 | 100 µl 500 µl x 2 |
| Spike (P.1 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter) | 78159 | 100 µl 500 µl x 2 |
| Spike (P.1 Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter) | 78144 | 100 µl 500 µl 500 µl x 2 |
| Spike (SARS-CoV-2) Lentivirus | 78010 | 100 µl 500 µl x 2 |
| Spike (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter) | 79981 | 100 µl 500 µl x 2 |
| Spike (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter) | 79942 | 100 µl 500 µl x 2 |
| Spike(SARS-CoV-2) Pseudotyped Lentivirus (Luc-eGFP Dual Reporter) | 79982 | 100 µl 500 µl x 2 |
| STAT3 Luciferase Reporter Lentivirus | 79744 | 500 µl x 2 |
| STAT5 Luciferase Reporter Lentivirus | 79745 | 500 µl x 2 |

Lentiviruses

Product Listing

| Lentiviruses | Catalog# | Size |
|--|----------|---|
| TCF/LEF Luciferase Reporter Lentivirus (Wnt/ β -catenin Signaling Pathway) | 79787 | 500 μ l x 2 |
| TCR Activator Lentivirus (CMV Promoter/Puromycin) or (EF1a Promoter/Puromycin) or (EF1a Promoter/Hygromycin) | 79894 | 500 μ l x 2 |
| TCR CRISPR/Cas9 Lentivirus (Integrating) | 78055 | 500 μ l x 2 |
| TCR CRISPR/Cas9 Lentivirus (Non-Integrating) | 78062 | 500 μ l x 2 |
| TEAD Luciferase Reporter Lentivirus | 79833 | 500 μ l x 2 |
| TIGIT CRISPR/Cas9 Lentivirus (Integrating) | 78058 | 500 μ l x 2 |
| TIGIT CRISPR/Cas9 Lentivirus (Non-Integrating) | 78065 | 500 μ l x 2 |
| TMPRSS2 Lentivirus | 78011 | 100 μ l 500 μ l 500 μ l x 2 |
| YFP (Topaz) Lentivirus | 79989 | 500 μ l x 2 |



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