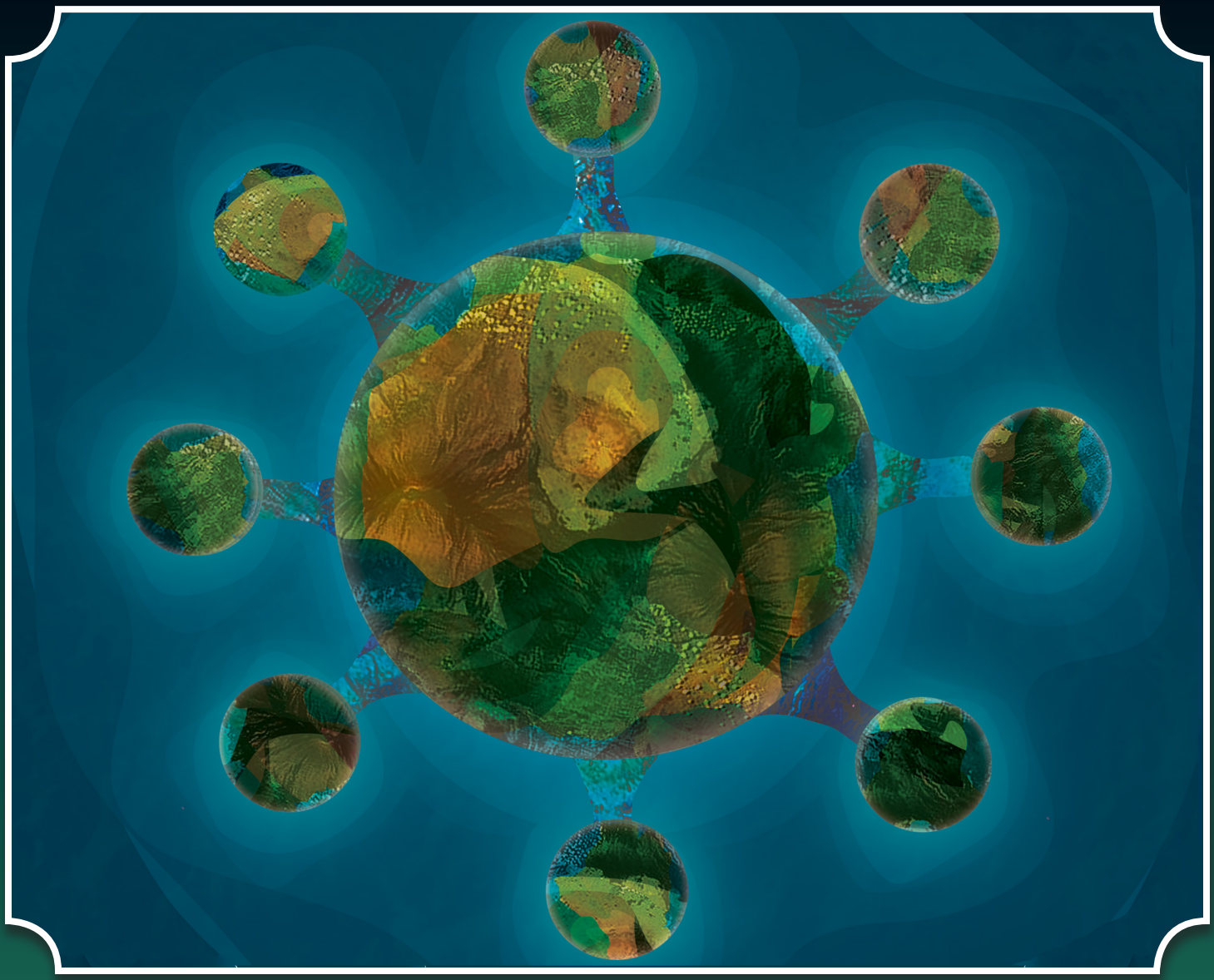
BPS Bioscience

VIRUS-BASED TOOLS

FOR DRUG DISCOVERY

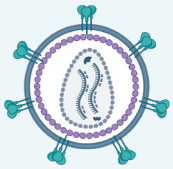
Lentivirus | Vesicular Stomatitis Virus | Adeno-Associated Virus



Optimized Viral Options

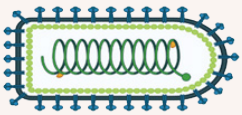
Virus-based tools such as Lentivirus, Adeno-Associated Virus (AAV), and Vesicular Stomatitis Virus (VSV) are critical for cell engineering and the study of viral infection. We have designed a suite of ready-to-use viral reagents to address a wide span of research areas including virology (particularly Coronaviruses), immunotherapy, CAR-T therapy, CRISPR, cell signaling, and more.

Lentivirus



Ideal for pseudotyping or engineering stable cell lines, lentiviruses deliver relatively large genes that can integrate into the host genome.

VSV

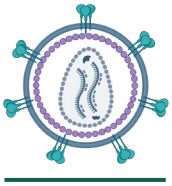


VSV is an excellent tool to model viral infection using pseudotyped viruses that replace the VSV-G protein with a desired viral protein of interest. Some cell infectivity models work best with VSV.

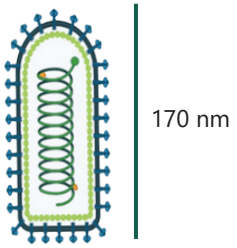
AAV

AAV is an ideal viral vector for delivery into primary cells both in vitro and in vivo. Its low immunogenicity and pathogenicity enable safe gene therapy.

Comparison of Viral Products



120 nm



80 nm

25 nm

	HIV-based lentivirus	VSV Delta G	AAV
Genome size	9.7 kb	11 kb	4.7 kb
Suggested max insert size	10 kb	4.5 kb	2.5 kb
Genome type	ssRNA	ssRNA	ssDNA
Pseudotyping	Yes	Yes	No
Integration	Yes – stable (retrovirus)	No	No
Transduce exogenous gene of interest	Yes -stable	Yes - transient	Yes >6 months
Time to peak expression	72 hours	24-48 hours	7 days (2 weeks *in vivo)*
Biosafety level	2	2	1
In vivo use (animals)	Low efficiency	-	Most suitable
Immune response	Yes, medium	-	Ultra-low
Preferred applications	Gene transfer (*in vitro*, stable)	Model viral infection	Gene transfer (*in vitro* and *in vivo)*

Our Advantages

Produced In-House

- Made in the USA at our San Diego, CA laboratory
- Customized, personal support directly from our scientists

Committed to Excellence

- ISO 9001:2015-certified Quality Management System
- Lot-specific quality control testing

Expansive Portfolio

- Choose from over 140 ready-to-use lentivirus, AAV, and VSV vectors to study CAR-T, cell signaling pathways, coronavirus, CRISPR, and immunotherapy
- Long-term stable expression of a transgene with low immunogenicity, low toxicity, and high transduction efficiencies

Custom Services

- Design a custom virus with reporters and selection markers of your choice
- Utilize our cell line development services to generate overexpression and reporter cell lines
- Generate knock-out/knock-in cell lines or integrating/non-integrating viruses

Online Resources

Lentivirus Tools Webinar
https://bpsbioscience.com/videos?topic=lentiviruses

Lentivirus FAQs
https://bpsbioscience.com/lentivirus-faq

Lentiviruses for SARS-CoV-2 Research Tech Note
https://bpsbioscience.com/pseudoviruses-sars-cov-2-research

SARS-CoV-2 Pseudoviruses eBook
https://bpsbioscience.com/ebooks?category=coronavirus

Lentivirus Products

Lentiviruses are enveloped retroviruses that fuse with the target cell membrane, delivering genetic material into the cytoplasm of the cell. Our replication-incompetent lentiviruses have been VSV-G pseudotyped, making these virus particles safe, stable and especially useful to target a wide range of cell types. For infectivity assays, we have developed lentiviral products pseudotyped with SARS-CoV-2 spike proteins, specific to variant mutations. Our suite of over 120 lentivirus products enables studies across a wide range of research areas.

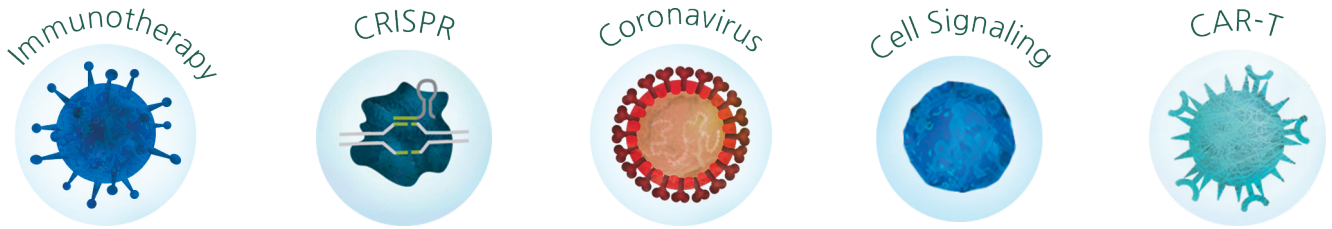
Applications

- Stable cell line generation
- Protein expression
- CRISPR/Cas9 knockout
- Generating cellular reporter assays (GFP, luciferase)
- Screen for neutralizing antibodies

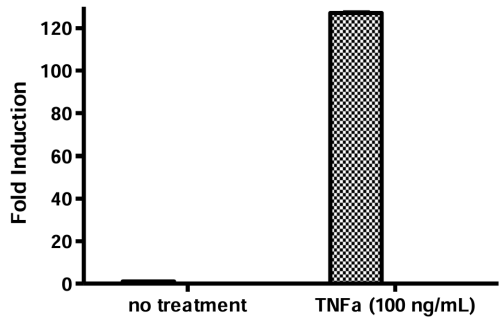
Advantages

- Can infect actively dividing and non-dividing cells
- Can infect a wide range of cell stages
- Size of inserted DNA can be up to 10 kb
- Long term stable expression of a transgene
- Low cellular toxicity
- High transduction efficiency

Research Areas

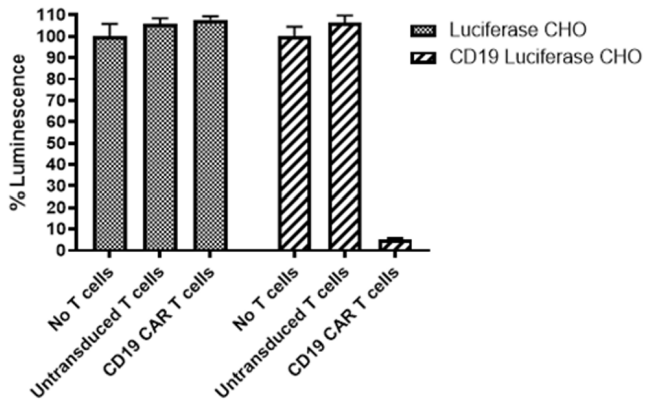


TNFα response of HEK293 cells transduced with NF-κB luciferase reporter lentivirus (#79564)



HEK293 cells transduced with NF-κB luciferase reporter lentivirus demonstrate induction of luciferase activity upon activation with TNFα. Fold induction was determined by comparing values against the control cells without TNFα treatment.

Activity of CD4/CD8 T cells transduced with anti-CD19 CAR Lentivirus (#78600)

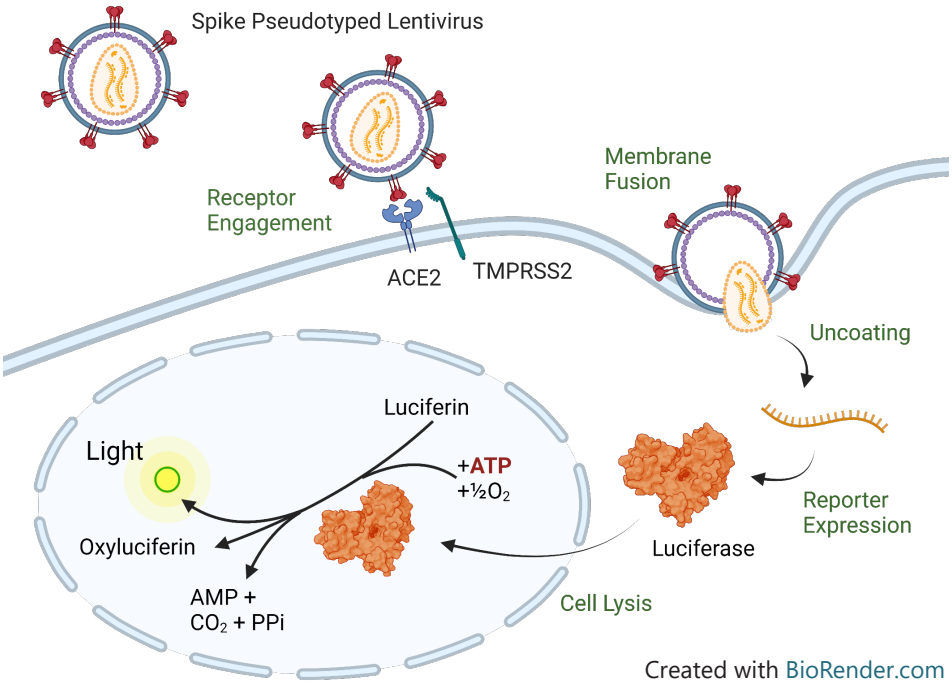


Anti-CD19 CAR Lentivirus-transduced T cells demonstrate specific killing of CD19/Luciferase CHO cells.

Pseudoviruses for Modeling Infection

Principle of the Assay

Lentivirus and VSV vectors can be pseudotyped, which involves replacing the native envelope protein with another viral protein of interest. For example, variant-specific SARS-CoV-2 Spike protein can be expressed on lentivirus or VSV delta G particles for infection of ACE2-expressing cells. The delivered genomes are engineered to express reporter genes such as luciferase or eGFP, enabling sensitive, quantitative readouts of infection. These systems serve as excellent models to screen for blocking antibodies or small molecule inhibitors of infection.



Created with BioRender.com

Options for Optimal Experimentation

Virus Type

- Lentivirus
- VSV delta G (preferred for Vero E6 infection)

Reporters

- Luciferase
- eGFP
- Dual (Luc+eGFP)

Target Cell Types

- HeLa (ACE2)
- CHO (ACE2)
- HEK293 (ACE2)
- Vero E6 (TMPRSS2)

Coronavirus Spike Variants

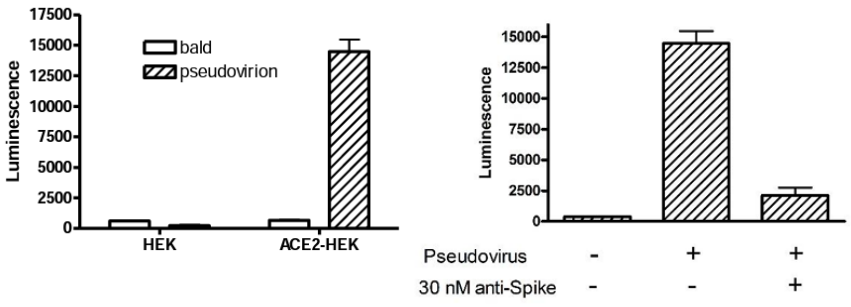
- SARS-CoV-2 emerging variants: BA.4/5, BA.2, BA.1
- Previous variants of interest: B.1.621, B.1.617.2, B.1.617.1, and many more.

Advantages

- High titer
- Simple protocols, suitable for high throughput assays
- Bald Lentivirus and VSV delta G controls
- Lentiviruses to express receptors: ACE2, TMPRSS2
- Quickly customizable to address emerging variant mutations or new viruses

Example Data

Spike (SARS-CoV-2) Pseudotyped Lentivirus (Luc-eGFP Dual Reporter) (#79982) transduction of ACE2-HEK293 cells monitored by luciferase activity



AAV Gene Delivery and Reporter Vectors

Adeno-Associated Virus (AAV) is a small dependoparvovirus which was initially discovered as a contaminant in adenovirus preparations. AAVs are non-enveloped and consist of an icosahedral capsid containing a short, single-stranded DNA genome flanked by two Inverted Terminal Repeat sequences (ITRs).

Recombinant AAV used in gene therapy has been engineered to be integration-deficient and to deliver a gene of interest (up to ≤5 kb in length) in place of the viral genome. Inside the cell, the recombinant AAV vector exists as an episome and can result in sustained expression of the gene of interest for up to 6 months in non-dividing cells. Due to its low immunogenicity and lack of insertional mutagenesis, AAVs are safe for clinical use and are the vector of choice for many gene therapies currently in development.

AAV Serotypes

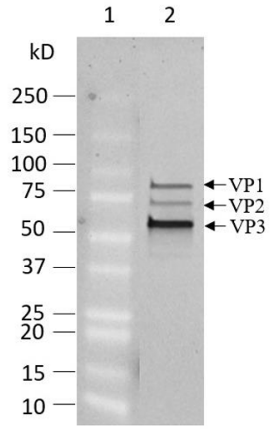
To date, 11 AAV serotypes have been characterized, each of these showing preferential binding for specific cell types and tissues. Thus, scientists can utilize this tropism to efficiently target specific cell types. In addition, several genetically engineered AAV serotypes have been developed to further increase tissue tropism and transduction efficiency for gene therapy purposes.

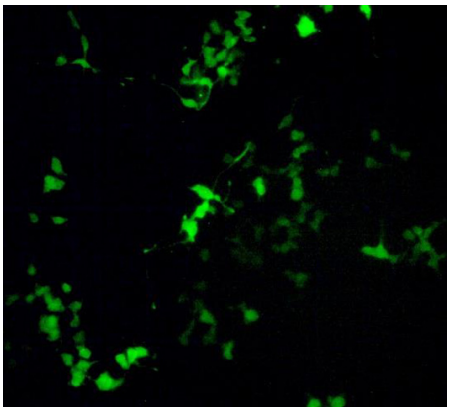
AAV1	CNS, Heart, Skeletal Muscle
AAV2	CNS, Kidney
AAV3	Liver
AAV4	CNS, Lung
AAV5	CNS, Lung
AAV6	Lung, Skeletal Muscle
AAV7	Liver, Skeletal Muscle
AAV8	CNS, Heart, Liver, Pancreas, Skeletal Muscle
AAV9	CNS, Heart, Liver, Lung, Skeletal Muscle

AAV Reporter Particles

Reporter proteins, such as luciferase or fluorescent markers, are ideal to visualize and/or quantify protein expression following AAV transduction. Luciferase, eGFP, ZsGreen, and mCherry-containing AAVs can be used to optimize transduction and experimental conditions, track transgene expression over time, or be used as internal controls.

Example data for AAV1 ZsGreen particles (#78443)





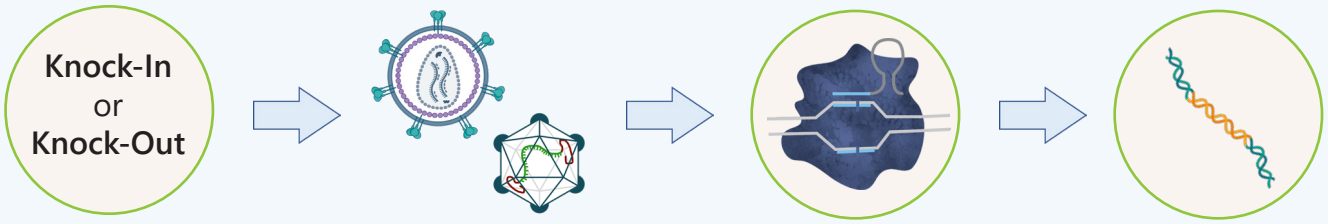
Left: Western blot of purified AAV1 ZsGreen particles display clear expression of AAV proteins: VP1, VP2, and VP3.

Right: Fluorescence microscopy of HEK293 cells 72 hours after transduction with AAV1 ZsGreen. ZsGreen expression was stable over time and still observed 30 days post transduction.

CRISPR/Cas9 Cell Engineering

Lentivirus and AAV vectors can be used for CRISPR/Cas9-based cell engineering. Our off-the-shelf CRISPR lentiviruses are replication incompetent, HIV-based, VSV-G pseudotyped lentiviral particles that can transduce almost all types of mammalian cells, including primary and non-dividing cells. AAV can also be used to tranduce primary cells, including *in vivo*, with SaCas9, derived from *Staphylococcus aureas*, which has high cutting efficiency in mammalian cells.

The Logic Flow



Decide on the experimental approach.

Decide on the viral vectors to use.

Decide to transduce Cas9+sgRNA or use Cas9-expressing cells.

For lentivirus, decide on integrating or non-integrating.

Integrating vs Non-Integrating Lentiviruses

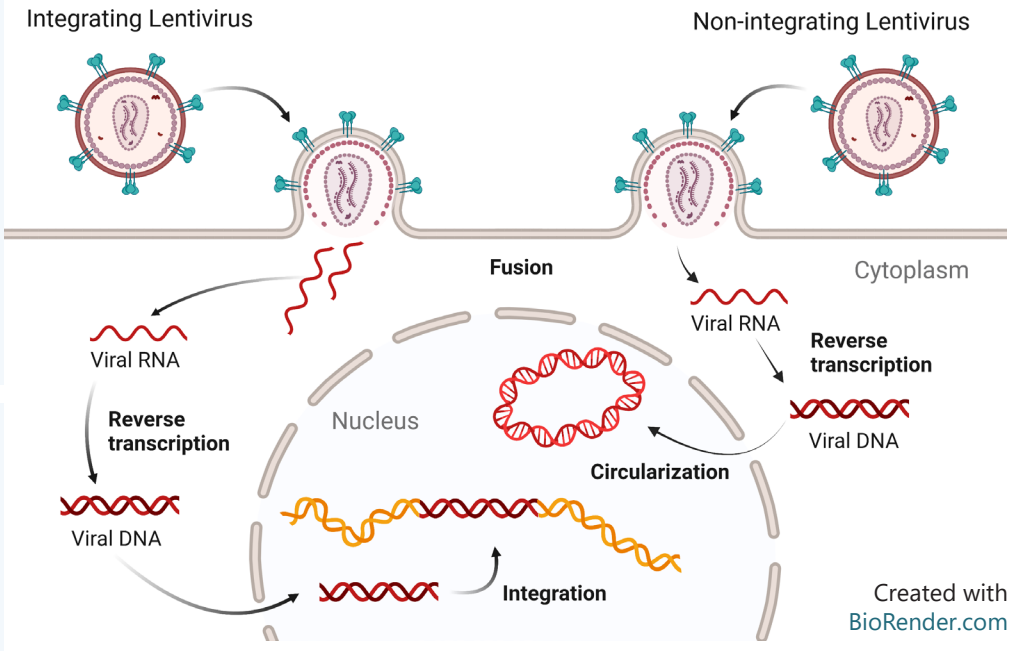
Lentiviruses are typically constructed to include the wild-type integrase enzyme that will integrate the Cas9 and sgRNA genes into the host genome. Alternatively, a non-active mutant integrase can be used, resulting in a non-integrating virus. Each has benefits and limitations which are compared below.

Integrating

- Puromycin selection increases knock-out efficiency by ensuring high expression of Cas9 and the sgRNA
- Generates higher knock-out efficiencies in a cell pool
- Increased risk of off-target gene disruptions

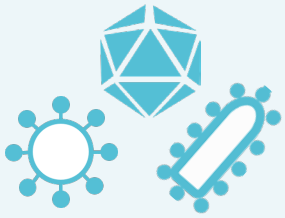
Non-Integrating

- Transient expression of Cas9 and sgRNA*
- Prolonged puromycin selection not required
- Eliminates risk of off-target effects
- Overall percentage of knockouts may be lower, so limiting dilution is required

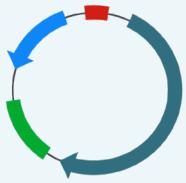


*Note that although non-integrating lentiviruses only transiently express Cas9 and sgRNA, they can still be used to generate stable cell lines because the changes in the genomic DNA from the Cas9 nuclease activity and NHEJ repair are permanent.

Custom Virus Services



We can develop custom viruses for your research needs.



We can engineer your virus and cell lines with reporters, selection markers, variants, and specific mutations.

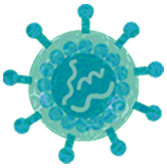
We can generate custom stable overexpression, knockout, or reporter cell lines using your virus.

Choose integrating or non-integrating lentiviruses for cellular protein knock-out or knock-in.

Our Milestone-Measured Process for Virus-Based Cell Engineering

1 Molecular Biology

Viral vectors are generated using available clones, or through the use of synthetic DNA.



2 Virus Production

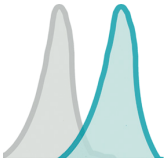
The custom virus is manufactured for development of the stable cell line.

3 Selection and Pool Generation

Parental cells are transduced with virus. The cell pool is selected for using antibiotics.

4 Limiting Dilution and Clonal Selection

Based on the results of the initial pool testing, the cell pool is diluted and single cell-derived clones are selected.

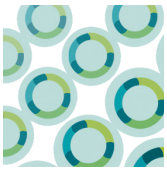


5 Confirmation of Expression

The expression level of the target protein is analyzed via Western blot or flow cytometry.

6 Functional Validation

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



7 Stability Testing

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

Why choose BPS Bioscience for your custom projects?

- We have extensive expertise and experience in developing and manufacturing custom and off-the-shelf viral products.
- We have helped accelerate projects across large pharma, vaccine developers, biotech and basic research institutions.
- Our high quality custom products have returned excellent customer satisfaction scores.

Give us a try today.

AAVs	Catalog#
AAV ONE-Extract™ Solution	78585
AAV-6 Anti-CD19 CAR (CD19 ScFv-CD8-4-1BB-CD3ζ)	82093
AAV-DJ Anti-CD19 CAR (CD19 ScFv-CD8-4-1BB-CD3ζ)	82092
AAV-DJ CD68-Luciferase	82136
AAV-DJ Luciferase	78451
AAV-DJ Luciferase-eGFP	78460
AAV-DJ Luciferase-mCherry	78469
AAV-DJ MBP eGFP	82112
AAV-DJ SaCas9	78478
AAV-DJ Scrambled shRNA Control	78871
AAV-DJ SP-B-Luciferase	82135
AAV-DJ SYN1-Luciferase	82134
AAV-DJ TERT-Luciferase	82137
AAV-DJ ZsGreen	78442
AAV-DJ-CMV-mCherry	82253
AAV1 Luciferase	78452
AAV1 Luciferase-eGFP	78461
AAV1 Luciferase-mCherry	78470
AAV1 SaCas9	78479
AAV1 ZsGreen	78443
AAV2 Luciferase	78453
AAV2 Luciferase-eGFP	78462
AAV2 Luciferase-mCherry	78471
AAV2 SaCas9	78480
AAV2 ZsGreen	78444
AAV3 Luciferase	78454
AAV3 Luciferase-eGFP	78463
AAV3 Luciferase-mCherry	78472

AAVs	Catalog#
AAV3 SaCas9	78481
AAV3 ZsGreen	78445
AAV4 ZsGreen	78446
AAV5 Luciferase	78456
AAV5 Luciferase-eGFP	78465
AAV5 Luciferase-mCherry	78474
AAV5 SaCas9	78483
AAV5 ZsGreen	78447
AAV6 Luciferase	78457
AAV6 Luciferase-eGFP	78466
AAV6 Luciferase-mCherry	78475
AAV6 SaCas9	78484
AAV6 ZsGreen	78448
AAV8 Luciferase	78458
AAV8 Luciferase-eGFP	78467
AAV8 Luciferase-mCherry	78476
AAV8 SaCas9	78485
AAV8 ZsGreen	78449
AAV9 Luciferase	78459
AAV9 Luciferase-eGFP	78468
AAV9 Luciferase-mCherry	78477
AAV9 SaCas9	78486
AAV9 ZsGreen	78450

Lentiviruses	Catalog#
ACE2 Lentivirus	79944
Androgen Receptor Luciferase Reporter Lentivirus	78763
Anti-BCMA CAR Lentivirus (Clone C11D5.3 ScFv-CD8-4-1BB-CD3ζ)	78655

Lentiviruses	Catalog#
Anti-BCMA CAR Lentivirus (VHH1/VHH2 ScFv-CD8-4-1BB-CD3ζ)	78783
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-4-1BB-CD3ζ)	78600
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-4-1BB-CD3ζ, eGFP)	78775
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-4-1BB-CD3ζ, IL-15/IL-15Ra)	82378
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-4-1BB-CD3ζ, PuroR)	78602
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-4-1BB-CD3ζ; SIN Vector)	78601
Anti-CD19 CAR Lentivirus (CD19 ScFv-CD8-CD28-CD3ζ, IL-15/IL-15Ra)	82379
Anti-CD19/CD22 Bispecific CAR Lentivirus (Clones FMC63/m971 ScFv-CD8-4-1BB-CD3ζ)	78609
Anti-CD20 CAR Lentivirus (Clone 3H7-CD8-41BB-CD3ζ)	82493
Anti-CD20 CAR Lentivirus (Clone Leu-16 ScFv-CD8-4-1BB-CD3ζ)	78606
Anti-CD22 CAR Lentivirus (Clone m971 ScFv-CD8-4-1BB-CD3ζ)	78608
Anti-GPC3 CAR Lentivirus (Clone GC33-CD28TM-41BB-CD3ζ)	82494
Anti-Mesothelin CAR Lentivirus (P4 ScFv-CD8-4-1BB-CD3ζ)	78703
AP1 eGFP Reporter Lentivirus (JNK Signaling Pathway)	78680
AP1 Luciferase Reporter Lentivirus (JNK Signaling Pathway)	79823
ARE Luciferase Reporter Lentivirus	79869
ATF6 Luciferase Reporter Lentivirus (ATF6 Pathway)	78667
B2M (Human) CRISPR/Cas9 Lentivirus (Integrating)	78340
B2M (Human) CRISPR/Cas9 Lentivirus (Non-Integrating)	78341
B2M HLA-A*01:01 Lentivirus	82423
B2M HLA-A*02:01 Lentivirus	82424
B2M HLA-A*03:01 Lentivirus	82425
B2M HLA-A*11:01 Lentivirus	82426
B2M HLA-A*24:02 Lentivirus	82427
B2M HLA-B*07:02 Lentivirus	82428
B2M HLA-B*08:01 Lentivirus	82429
B2M HLA-B*15:10 Lentivirus	82430
B2M HLA-B*35:01 Lentivirus	82431

Lentiviruses	Catalog#
B2M HLA-B*40:01 Lentivirus	82432
B2M HLA-E Lentivirus	82433
B2M HLA-G1 Lentivirus	82445
B7-H4 Lentivirus	78727
Bald Lentiviral Pseudovirion (eGFP Reporter)	79987
Bald Lentiviral Pseudovirion (Luc-eGFP Dual Reporter)	79988
Bald Lentiviral Pseudovirion (Luciferase Reporter)	79943
BCMA CRISPR/Cas9 Lentivirus (Integrating)	78893
BCMA CRISPR/Cas9 Lentivirus (Non-Integrating)	78894
BCMA Lentivirus	78714
Cas9 Lentivirus (Hygromycin Selection)	78067
Cas9 Lentivirus (Inducible Tet-On)	78794
Cas9 Lentivirus (Neomycin Selection)	78432
Cas9 Lentivirus (Puromycin Selection)	78066
CBL-B (Human) CRISPR/Cas9 Lentivirus (Integrating)	78343
CBL-B (Human) CRISPR/Cas9 Lentivirus (Non-Integrating)	78344
CD19 Lentivirus	78657
CD2 Lentivirus	82434
CD20 Lentivirus	78658
CD22 Lentivirus	78659
CD40 Ligand (CD40L) Lentivirus	78931
CD47 CRISPR/Cas9 Lentivirus (Integrating)	78056
CD47 CRISPR/Cas9 Lentivirus (Non-Integrating)	78063
CD5 (Human) CRISPR/Cas9 Lentivirus (Integrating)	78119
CD5 (Human) CRISPR/Cas9 Lentivirus (Non-Integrating)	78198
CD8a Lentivirus	78648
CD8a/CD8b Lentivirus	78650
CDH11 Lentivirus	82455

Lentiviruses	Catalog#
CDH17 Lentivirus	82346
CEACAM5 Lentivirus	78719
CEACAM6 Lentivirus	78720
CIITA (Human) CRISPR/Cas9 Lentivirus (Integrating)	78435
CIITA (Human) CRISPR/Cas9 Lentivirus (Non-integrating)	78434
Claudin-3 Lentivirus	78722
Claudin-4 Lentivirus	78723
Claudin-9 Lentivirus	78721
CRBN CRISPR/Cas9 Lentivirus (Integrating)	78517
CRBN CRISPR/Cas9 Lentivirus (Non-Integrating)	78518
CRE/CREB eGFP Reporter Lentivirus	78153
CRE/CREB Luciferase Reporter Lentivirus	79580
CRISPR/Cas9 Kinase Knockout Lentivirus Library (Array Format)	78487
CSL (CBF1/RBP-Jk) Luciferase Reporter Lentivirus (Notch Signaling Pathway)	78746
CTLA4 CRISPR/Cas9 Lentivirus (Integrating)	78054
CTLA4 CRISPR/Cas9 Lentivirus (Non-Integrating)	78061
Cyno CD8a/CD8b Lentivirus	82373
Cyno EpCAM Lentivirus	78978
DLL1 Lentivirus	82340
DLL3 Lentivirus	78909
DLL4 Lentivirus	82341
Dominant Negative TGF-β Receptor Type II (TGF-βRII) Lentivirus	78928
eGFP Lentivirus (Inducible TET On)	78629
EGR1 Promoter Luciferase Reporter Lentivirus	78664
Endoplasmic Reticulum (ER) eGFP Lentivirus	82326
Enhanced GFP Lentivirus (G418, Hygromycin and Puromycin)	78639
EpCAM Lentivirus	78718
Estrogen Response Element (ERE) Luciferase Reporter Lentivirus	78764

Lentiviruses	Catalog#
Expression Negative Control Lentivirus (EF1A Promoter/Hygromycin, Puromycin, or G418)	82212
Expression Negative Control Lentivirus (G418 or Hygromycin or Puromycin)	79902
Expression Negative Control Lentivirus (Inducible TET On™)	82290
FcER1G Lentivirus	79878
FCGR2A CRISPR/Cas9 Lentivirus (Integrating)	78537
FCGR2A CRISPR/Cas9 Lentivirus (Non-Integrating)	78538
FcGRIIB (CD32B) Lentivirus	79877
FcGRIIIA (CD16a) Lentivirus	79876
FcRL5 Lentivirus	78715
FcRL5 Lentivirus (Macaca fascicularis/Cynomolgus)	78781
Firefly Luciferase Lentivirus (EF1A Promoter/Geneticin, Hygromycin, Puromycin, or Blasticidin)	78740
Firefly Luciferase Lentivirus (G418, Hygromycin and Puromycin)	79692
Firefly Luciferase Lentivirus (UbC Promoter)	79880
Firefly Luciferase-eGFP Lentivirus (EF1A Promoter/Geneticin, Hygromycin, Puromycin, or Blasticidin)	78741
Firefly Luciferase-eGFP Lentivirus (G418) or (Puromycin)	79980
Firefly Luciferase-Nuclear eGFP Lentivirus	82335
FOLR1 Lentivirus (Macaca fascicularis/Cynomolgus)	78778
GAL4 DBD-GR Lentivirus	78632
GAS Luciferase Reporter Lentivirus (IFN-γ/JAK/STAT1 Pathway)	78653
GPC3 Lentivirus	78711
GPRC5D Lentivirus	78716
GPRC5D Lentivirus (Macaca fascicularis/Cynomolgus)	78780
HLA-C*08:02 Lentivirus	78930
HLA-E Lentivirus	78929
HRE Luciferase Reporter Lentivirus	78668
HSE Luciferase Reporter Lentivirus (Heat Shock Response)	78669
Human CD4 Lentivirus (Hygromycin)	78987
IL-2 Promoter Luciferase Reporter Lentivirus	79825

Lentiviruses	Catalog#
IL-8 Promoter Luciferase Reporter Lentivirus	79827
IL15/IL15Ra Lentivirus	78938
ISRE Luciferase Reporter Lentivirus (JAK/STAT Signaling Pathway)	79824
ISRE mCherry Reporter Lentivirus (JAK/STAT Signaling Pathway)	82385
Kinase (Human) CRISPR/Cas9 Lentivirus (Integrating)	78488
KRAS G12D-Specific TCR Lentivirus (Clone 10)	78937
KRAS G12D-Specific TCR Lentivirus (Clone 9c)	78936
LAG3 CRISPR/Cas9 Lentivirus (Integrating)	78053
LAG3 CRISPR/Cas9 Lentivirus (Non-Integrating)	78060
LAG3 Lentivirus	82388
LAIR1 Lentivirus	78903
LILRB1 Lentivirus	82450
LILRB2 Lentivirus	82451
LILRB4 Lentivirus	82452
LYPD1 Lentivirus	78724
MAGE-A1-Specific TCR Lentivirus (Clone 1367)	78934
MAGE-A4 (p230-239) B2M HLA-A*02:01 Lentivirus	82441
MAGE-A4 Specific TCR Lentivirus	78935
MART-1-Specific TCR Lentivirus (Clone DMF4)	78678
MART-1-Specific TCR Lentivirus (Clone DMF5)	78679
mCherry Lentivirus (Hygromycin or Puromycin)	78932
Membrane eGFP Lentivirus	82324
Membrane-Bound TNFα (mTNFα) Lentivirus	78955
Mitochondrial eGFP Lentivirus	82325
Myc Luciferase Reporter Lentivirus	78628
Nectin-4 Lentivirus	78712
Negative Control eGFP Reporter Lentivirus	79927
Negative Control Luciferase Lentivirus	79578

Lentiviruses	Catalog#
NF-κB mCherry Reporter Lentivirus	82457
NF-κB eGFP Reporter Lentivirus	79926
NF-κB Luciferase Reporter Lentivirus	79564
NFAT eGFP Reporter Lentivirus	79922
NFAT Luciferase Reporter Lentivirus	79579
NFAT Luciferase-eGFP Reporter Lentivirus	78656
NFAT Luciferase-RFP Reporter Lentivirus	78617
NFκB Luciferase-eGFP Reporter Lentivirus	82336
NKp46 Lentivirus	78717
NKp46 Lentivirus (Macaca fascicularis/Cynomolgus)	78779
NLRP3 CRISPR/Cas9 Lentivirus (Integrating)	78545
NLRP3 CRISPR/Cas9 Lentivirus (Non-Integrating)	78546
NLRP3 Human shRNA Lentivirus	82122
Non-secreted Gaussia Luciferase Lentivirus (CMV Promoter)	79893-C
Notch1dE Lentivirus	78747
Nuclear eGFP Lentivirus (Puromycin)	78976
Nuclear mCherry Lentivirus	82334
NY-ESO-1 (p157-165) B2M HLA-A*02:01 Lentivirus	82440
NY-ESO-1-Specific TCR Lentivirus (Clone 1G4)	78675
NY-ESO-1-Specific TCR Lentivirus (Clone c259)	78676
p53 Luciferase Reporter Lentivirus	78666
PD-1 (Human) sgRNA-MS2 Lentivirus (Integrating)	78190
PD-1 CRISPR/Cas9 Lentivirus (Integrating)	78052
PD-1 CRISPR/Cas9 Lentivirus (Non-Integrating)	78059
PD-1 Lentivirus	82348
PD-L1 CRISPR/Cas9 Lentivirus (Integrating)	78057
PD-L1 CRISPR/Cas9 Lentivirus (Non-Integrating)	78064
PD-L1 Lentivirus	78925

Lentiviruses	Catalog#
PRAME-Specific TCR Lentivirus	78959
PSMA Lentivirus	78726
PTK7 Lentivirus	82347
Renilla Luciferase Lentivirus (G418 or Puromycin)	79565
Renilla Luciferase-eGFP Lentivirus (Hygromycin or Puromycin)	78958
RFP Lentivirus	78347-P
SBE Luciferase Reporter Lentivirus (TGFβ/SMAD Pathway)	79806
Secreted Gaussia Luciferase Lentivirus CMV Promoter or EF1A Promoter	79892
Spike (B.1.1.529 BA.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78349
Spike (B.1.1.529 BA.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78348
Spike (B.1.1.7, Alpha Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78158
Spike (B.1.1.7, Alpha Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78112
Spike (B.1.351, Beta Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78160
Spike (B.1.351, Beta Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78142
Spike (B.1.429, Epsilon Variant) Pseudotyped Lentivirus (Luc Reporter)	78172
Spike (B.1.617 Variant) Pseudotyped Lentivirus (Luc Reporter)	78204
Spike (B.1.617.1, Kappa Variant) Pseudotyped Lentivirus (Luc Reporter)	78205
Spike (B.1.617.2.1; Delta Plus Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78219
Spike (B.1.617.2.1; Delta Plus Variant) Pseudotyped Lentivirus (Luc Reporter)	78218
Spike (B.1.617.2; Delta Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78216
Spike (B.1.617.2; Delta Variant) Pseudotyped Lentivirus (Luc Reporter)	78215
Spike (B.1.618 Variant) Pseudotyped Lentivirus (Luc Reporter)	78206
Spike (B.1.621, Mu Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78618
Spike (BA.1.1, Omicron Variant R346K) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78624
Spike (BA.1.1, Omicron Variant R346K) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78623
Spike (BA.2, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78626
Spike (BA.2, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78625
Spike (BA.2.12.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78646
Spike (BA.2.12.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78645
Spike (BA.2.86, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78982
Spike (BA.2.86, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78980
Spike (BA.4/5, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78652
Spike (BA.4/5, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78651
Spike (BF.7, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78702
Spike (BF.7, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78699
Spike (BQ.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78700
Spike (BQ.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78697
Spike (BQ.1.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78701
Spike (BQ.1.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78698
Spike (D614G) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78035
Spike (D614G) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78028
Spike (JN.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78983
Spike (JN.1, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78981
Spike (K417T, E484K, N501Y) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78143
Spike (P.1, Gamma Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78159
Spike (P.1, Gamma Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luc Reporter)	78144
Spike (SARS-CoV-1) Pseudotyped Lentivirus (eGFP Reporter)	78633
Spike (SARS-CoV-1) Pseudotyped Lentivirus (Luc Reporter)	78614
Spike (SARS-CoV-2) Lentivirus	78010
Spike (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	79981
Spike (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	79942
Spike (XBB.1.16, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78785
Spike (XBB.1.16, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78784
Spike (XBB.1.5, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (eGFP Reporter)	78737
Spike (XBB.1.5, Omicron Variant) (SARS-CoV-2) Pseudotyped Lentivirus (Luciferase Reporter)	78736
Spike Variants (SARS-CoV-2) Pseudotyped Lentivirus Pack (Luciferase Reporter)	78616

Lentiviruses	Catalog#
Spike(SARS-CoV-2) Pseudotyped Lentivirus (Luc-eGFP Dual Reporter)	79982
SRE Luciferase Reporter Lentivirus	78627
SRE TurboRFP Reporter Lentivirus (Hygromycin)	82310
STAT3 eGFP Reporter Lentivirus	78197
STAT3 Luciferase Reporter Lentivirus	79744
STAT3 mCherry Reporter Lentivirus	82375
STAT4 Luciferase Reporter Lentivirus (GAS-IRF-1)	78654
STAT5 Luciferase Reporter Lentivirus	79745
STAT6 Luciferase Reporter Lentivirus (STAT6 Signaling Pathway)	78799
TCF/LEF Luciferase Reporter Lentivirus (Wnt/β-catenin Signaling Pathway)	79787
TCR Activator Lentivirus (CMV Promoter/Puromycin) or (EF1A Promoter/Puromycin) or (EF1A Promoter/Hygromycin)	79894
TCR CRISPR/Cas9 Lentivirus (Integrating)	78055
TCR CRISPR/Cas9 Lentivirus (Non-Integrating)	78062
TEAD Luciferase Reporter Lentivirus	79833
TGFBR2 CRISPR/Cas9 Lentivirus (Integrating)	78535
TGFBR2 CRISPR/Cas9 Lentivirus (Non-Integrating)	78536
TIGIT CRISPR/Cas9 Lentivirus (Integrating)	78058
TIGIT CRISPR/Cas9 Lentivirus (Non-Integrating)	78065
TMPRSS2 Lentivirus	78011
TNFR2 Lentivirus	78765
Trop2 Lentivirus	78710
Trop2 Lentivirus (Macaca fascicularis/Cynomolgus)	78776
UAS Luciferase Reporter Lentivirus	78631
ULBP2 Lentivirus	78744
ULBP2 Lentivirus (Macaca fascicularis/Cynomolgus)	78777
VSIG4 Lentivirus	78902
Vγ4Vδ1 TCR Lentivirus	78986
Vγ9Vδ2 TCR Lentivirus	78985

Lentiviruses	Catalog#
XRE Luciferase Reporter Lentivirus (AhR Signaling)	78672
YFP (Topaz) Lentivirus	79989

VSVs	Catalog#
Bald VSV Delta G (Luciferase Reporter)	78636
Spike (B.1.617.2, Delta Variant) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78640
Spike (BA.1.1, Omicron Variant) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78641
Spike (BA.2, Omicron Variant) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78635
Spike (BA.2.12.1, Omicron Variant) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78643
Spike (BA.4/5, Omicron Variant) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78644
Spike (D614G) (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78642
Spike (SARS-CoV-2) Pseudotyped VSV Delta G (Luciferase Reporter)	78637
VSV-G Pseudotyped VSV Delta G (Luciferase Reporter)	78634

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Ordering Information
orders@bpsbioscience.com

Technical Support
support@bpsbioscience.com

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BPS Bioscience, Inc.
6405 Mira Mesa Blvd, Suite 100
San Diego, CA 92121
Tel: 858-202-1401

bpsbioscience.com