BPS Bioscience

CRISPR-Cas9

Screening | Knock-out | Knock-in I Cell Line Development

INNOVATIVE PRODUCTS & SERVICES TO ADVANCE GENE EDITING RESEARCH

BPS Bioscience Advantages

Scientist Founded, Scientist Driven

Produced In-house

- All CRISPR products and services are produced and performed in the USA at our San Diego, California laboratory
- Get customized, personal support directly from our CRISPR experts

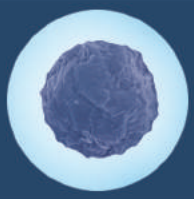
Multiple CRISPR Editing Tools and Applications

- CRISPR Knock-out
- CRISPR Knock-in
- CRISPR activation
- Cell lines, cell pools, lentiviruses, & plasmids
- CRISPR screens

Customized For Your Research Needs

- Screening & Profiling: >200 optimized cell lines and cell-based assays
- Cell Line Development: Choose from >70 cell types and >20 reporter genes
- Ready to use Lentiviruses: Integrating and non-integrating options

Knock-in Cell Lines



Introduce a specific point mutation or add a tag to your endogenous gene

Project Milestones

1 Molecular Biology

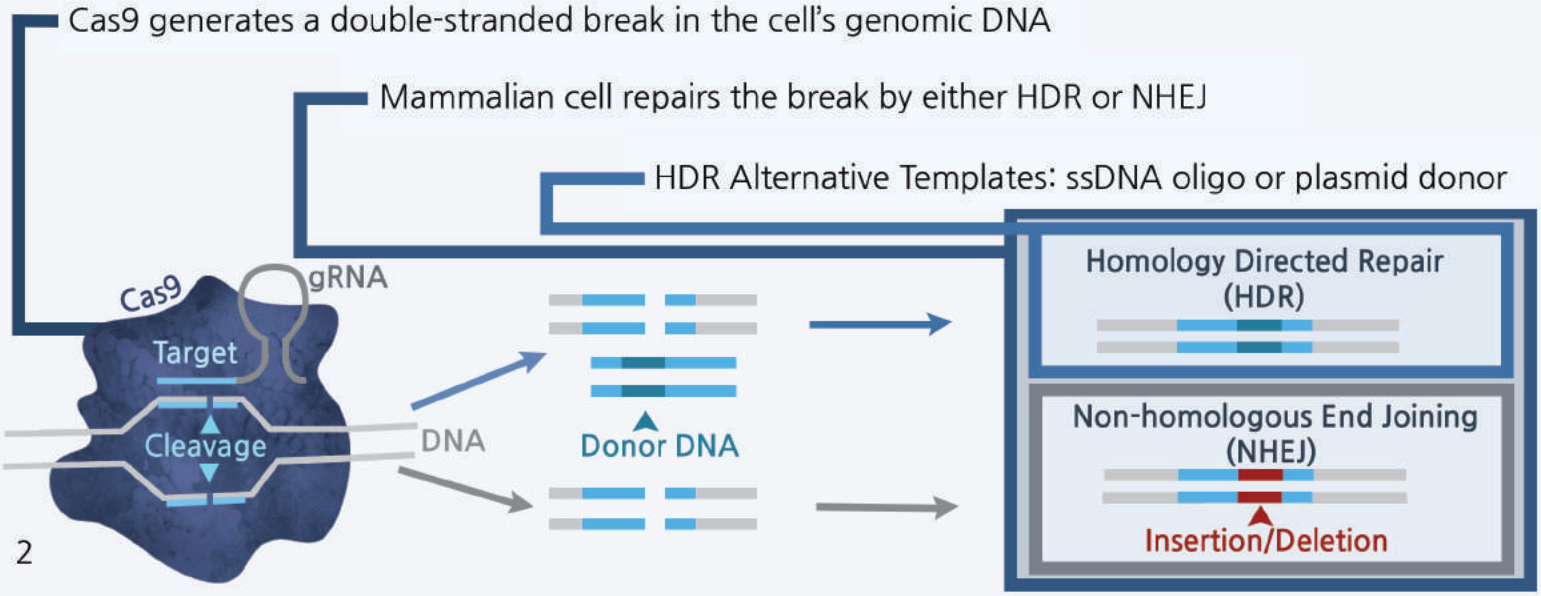
BPS will design and construct the gRNA and HDR template according to your experimental needs.

2 Stable Cell Line Generation

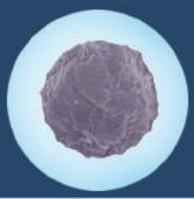
The cells will be transduced with the Cas9, gRNA, and HDR template, followed by genome editing evaluation. Single clones will be selected and expanded.

3 Genotyping & Confirmation

The knock-in mutations will be confirmed by genomic sequencing, and positive clones will be expanded for further confirmation.



Knock-out Cell Lines



- Knock-out your gene of interest for mechanistic or screening studies
- >20 available reporters
- >70 available cell types

Project Milestones

1 Molecular Biology

BPS will synthesize up to 5 sgRNA sequences and clone into a CRISPR expression vector for knock-out cell lines. BPS can also design the HDR template for knock-in cell lines.

2 CRISPR Transfection

Depending on the cell type, cells can be transduced via electroporation, liposome-based transfection, or viral infection.

3 Clonal Dilution

Based upon the results of the initial pool testing, the cell pool will be clonally diluted and the single cell-derived clones will be expanded.

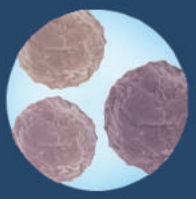
4 Confirmation of Expression

The expression level of the gene of interest will be analyzed via Western Blot or FACS.

5 Confirmation & Delivery

Knock-out of the gene of interest will be confirmed by genomic sequencing. Confirmed clones will be expanded, frozen, and tested for Mycoplasma contamination.

Knock-out Cell Pools



- Off the shelf products constitutively expressing Cas9 in variety of cell types: Jurkat, Neuro2A, A549, Raji, MDA-MB-231, HCT116, & more
- Cost-effective platform for setting up your own knock-out experiments or screens
- Custom services available for knock-out cell pool generation

Project Milestones

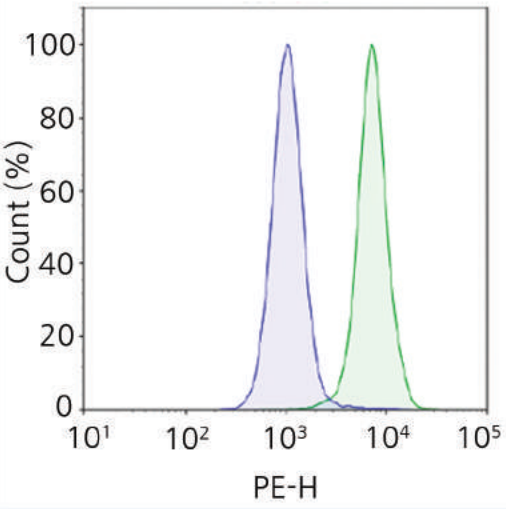
1 CRISPR Transfection

CRISPR transfection to express the Cas9

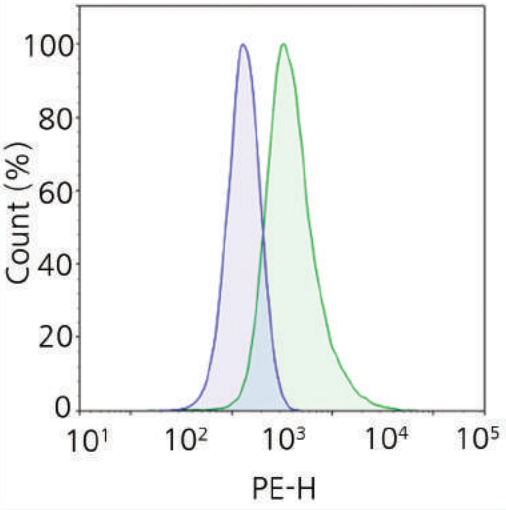
2 Cell Pool Testing

Cell pool testing to confirm presence of Cas9

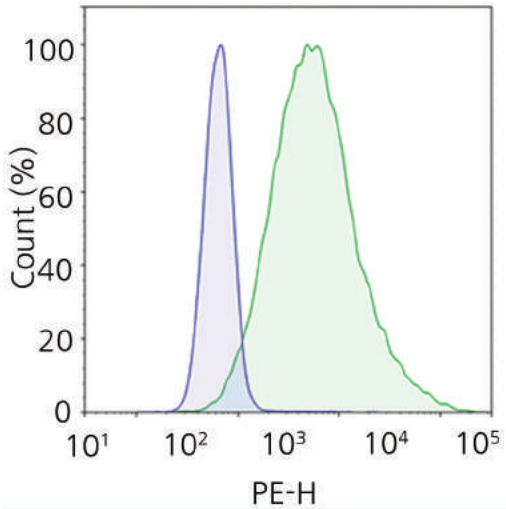
Expression of Cas9 in Neuro2A Cell Pool



Expression of Cas9 in Jurkat Cell Pool



Expression of Cas9 in A549 Cell Pool



CRISPR Activation

- Induce transcriptional activation and expression of any gene of interest
- Induction can be more than a hundred-fold, depending on the gene

Synergistic Activation Mediator System (SAM) Components

sgRNA MS2

MS2-tagged sgRNA

dCas9 VP64

Mutated dCas9, lacking any endonuclease activity, fused to VP64, a transcriptional activator

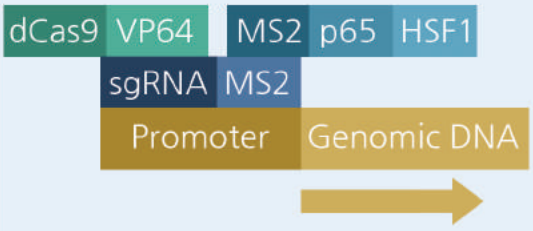
MS2 p65 HSF1

P65 (Transcription Factor p65 or Nuclear Factor NF-κB p65), and HSF1 (Heat Shock Factor 1) fused with an MS2 tag

SAM Activation Process

1 sgRNA-MS2 targets the promoter region of the gene of interest

2 dCas9-VP64 and MS2-P65-HSF1 are recruited to the site in the genomic DNA



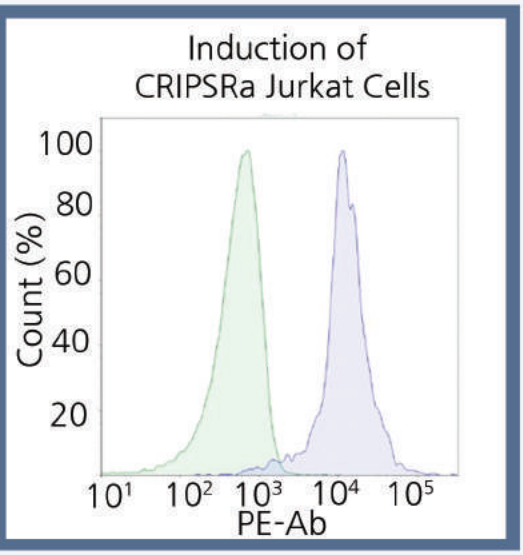
3 Transcription begins, inducing expression of the desired gene

Gene Activation with CRISPRa

CRISPRa (SAM) Jurkat cells were electroporated with sgRNA-MS2 targeting PD-1 to induce PD-1 expression. Cells were stained with PE-labeled anti-PD-1 antibody and analyzed by FACS.

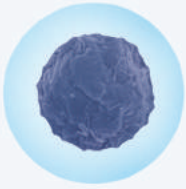
Parental CRISPRa Jurkat Cells

Transfected CRISPRa Jurkat Cells



CRISPRa Products & Services

Cell Lines



- Stably express dCas9 VP64 and MS2 P65 HSF1
- Transduce with sgRNA MS2 via lentiviral transduction or electroporation
- Convenient and cost-effective platform for setting up your own activating experiments or screens without the need to first select for single cell clones expressing dCas9-VP64 and MS2-P65-HSF1

Lentiviruses

Integrating dCas9 VP64 and MS2 P65 HSF1 Lentiviruses

- Ready to be transduced into almost all types of mammalian cells, including primary and non-dividing cells
- These particles contain the genes for dCas9-VP64 (with blasticidin resistance) and MS2-P65-HSF1 (with hygromycin resistance)

Integrating sgRNA MS2 Activating Lentivirus

- 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

Plasmids

- sgRNA MS2 plasmids can be transfected or electroporated into your cells for either transient or stable (following drug selection) activation
- Virus-free option, depending on your laboratory environment or preferences

Custom Services

- With BPS Bioscience's cell line development services, our team of highly experienced scientists generate custom CRISPR activation cell lines
- Customizable project milestones and deliverables

Lentiviruses

- Ready to transduce, no other components are required
- The surest way to quickly generate a knock-out cell line or cell pool
- Knock-out efficiencies as high as 90%

Versatile & Ready to Use

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 Lentiviruses	Non-integrating Lentiviruses
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

Cell Line Development Services

Conduct your research directly with a BPS lentivirus product, or choose to utilize our custom services to develop a cell line designed to meet your research needs. Our CRISPR experts will provide project guidance in addition to your custom lentivirus-generated knock-out cell line.

Screening Services

- CRISPR kinase knock-out library available as an array or pool
- Customized specifically for your research project

Knock-out Library

- Expansive CRISPR knockout library targeting human kinases

Knock-out Array

- Integrating Lentiviruses are shipped ready-to-transduce into almost all types of mammalian cells, including primary and non-dividing cells
- Each format includes 4 sgRNA per gene, in addition to the proper controls
- Array format comes ready-to-use, delivered as one gene-per-well, without the need for any high-throughput screening platforms or bioinformatic analysis

Knock-out Pool

- Our pooled format is delivered at high titer and customized for your screening capabilities
- Each format includes 4 sgRNA per gene, in addition to the proper controls

Custom Services

- BPS can generate CRISPR libraries targeting your genes of interest
- Data is provided after completion of each milestone
- Our scientists work closely with you to provide customized tools to meet your research objectives

CRISPR Cell Lines & Cell Pools, Proteins, Plasmids, Lentiviruses
Product Listing

CRISPR Cell Lines & Cell Pools	Catalog#	Size
Cas9 Expressing A549 Cell Pool	78072	2 vials
Cas9 Expressing Daudi Cell Pool	78089	2 vials
Cas9 Expressing HCT116 Cell Pool	78073	2 vials
Cas9 Expressing Jurkat Cell Pool	78070	2 vials
Cas9 Expressing MDA-MB-231 Cell Pool	78069	2 vials
Cas9 Expressing Raji Cell Pool	78071	2 vials
Cas9-Expressing A549 Cell Line (High Expression or Low Expression)	78134	2 vials
Cas9-Expressing Daudi Cell Line	78157	2 vials
Cas9-Expressing HCT116 Cell Line (High or Low Expression)	78135	2 vials
Cas9-Expressing HEK293 Cell Line	78166	2 vials
Cas9-Expressing HeLa Cell Pool	78161	2 vials
Cas9-Expressing Jurkat Cell Line (High or Low Expression)	78136	2 vials
Cas9-Expressing MCF7 Cell Pool	78179	2 vials
Cas9-Expressing MDA-MB-231 Cell Line (High or Low Expression)	78150	2 vials
Cas9-Expressing Neuro2A Cell Line (High or Low Expression)	78137	2 vials
Cas9-Expressing Neuro2A Cell Pool	78087	2 vials
Cas9-Expressing Raji Cell Line	78156	2 vials
CRISPRa (SAM) Jurkat Cell Line	78080	2 vials
TCR Knockout NFAT-Luciferase Reporter Jurkat Recombinant Cell Line	79887	2 vials

Proteins	Catalog#	Size
Cas9, His-tag (S. pyogenes)	100206	50 µg 100 µg 500 µg

Plasmids	Catalog#	Size
PD-1 sgRNA-MS2 for CRISPRa (Plasmid)	78091	5 µg

Lentiviruses	Catalog#	Size
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
CTLA4 CRISPR/Cas9 Lentivirus (Integrating)	78054	500 µl x 2
CTLA4 CRISPR/Cas9 Lentivirus (Non-Integrating)	78061	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
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
TCR CRISPR/Cas9 Lentivirus (Integrating)	78055	500 µl x 2
TCR CRISPR/Cas9 Lentivirus (Non-Integrating)	78062	500 µl x 2
TIGIT CRISPR/Cas9 Lentivirus (Integrating)	78058	500 µl x 2
TIGIT CRISPR/Cas9 Lentivirus (Non-Integrating)	78065	500 µl x 2

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