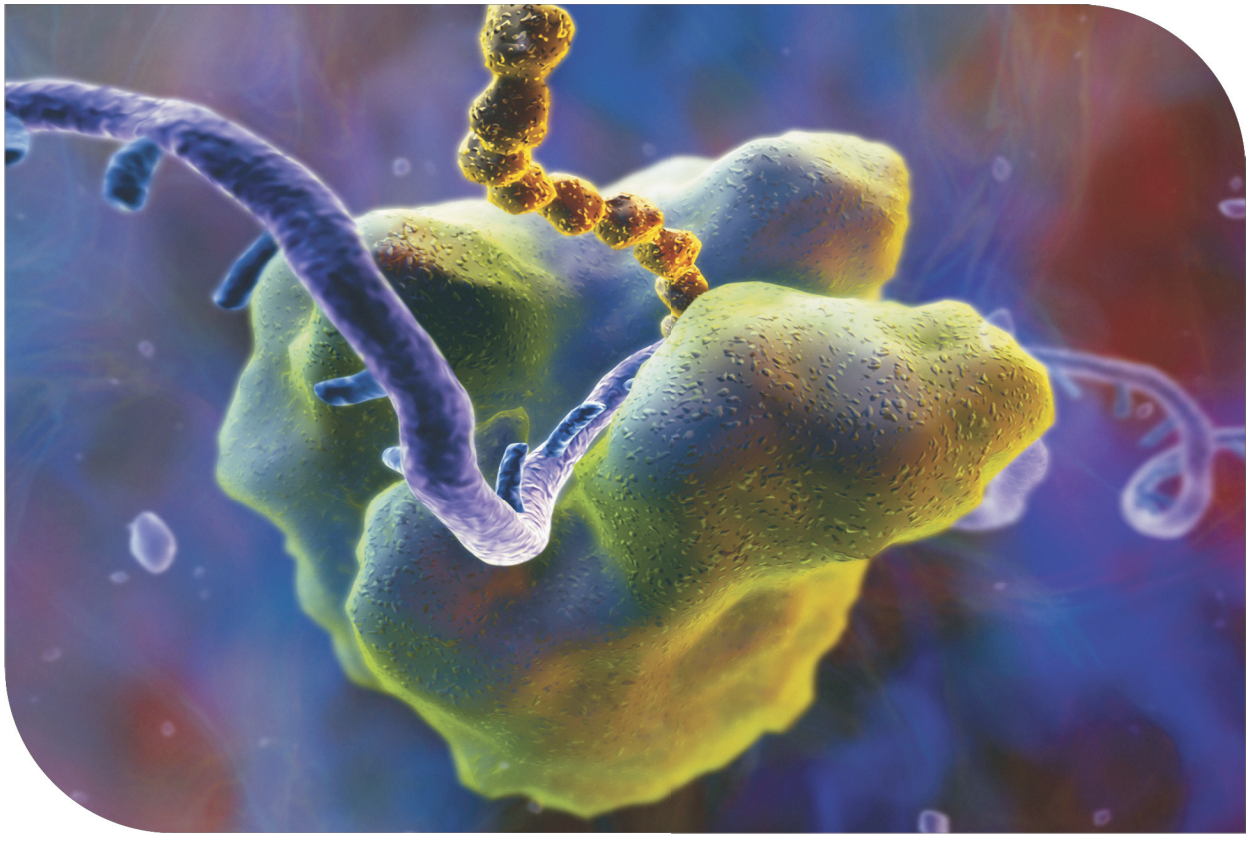
ORF cDNA Expression Clones



Expression-Ready ORF cDNA Clones
OmicsLink™ ORF cDNA Clones

Tag Technologies
Fusion Tags: Singular and Tandem
OmicsLink™ Anti-Tag Antibodies

Expression Systems
Mammalian, Lentiviral, Bacterial, Yeast, Insect,
Wheat Germ Cell Free

ORF cDNA Shuttle Clones
ORF*EXPRESS*™ Gateway® PLUS Shuttle Clones

GeneCopoeia™
Expressway to Discovery

Free from Cloning

Save time and resources

Over-expression of genes and proteins is widely used in functional genomics, proteomics and system biology studies. However, generation of expression clones frequently requires multi-step cloning processes as well as lengthy verification and sequence analysis. Also, when proteins of interest are hard to produce in heterologous systems or cannot be purified by standard methods, or need to be visualized for subcellular localization, etc., custom vectors and codon optimization are often needed. Therefore, it can easily take you weeks or even months to build the final constructs that meet your needs.

Let GeneCopoeia do the work for you so you can focus on other challenging tasks. GeneCopoeia provides wide choices of expression systems, promoters, fusion tags and selection markers. Researchers can either request to have their gene of interest cloned into a chosen vector, or simply order from GeneCopoeia premade expression-ready ORF cDNA clone collection. All constructs are fully sequence-verified and ready-for-expression.

Approach 1
Start protein expression right away using expression-ready ORF cDNA clones

Approach 2
Start cloning using ORF cDNA shuttle clones

Approach 3
Start cloning using full-length cDNA template clones

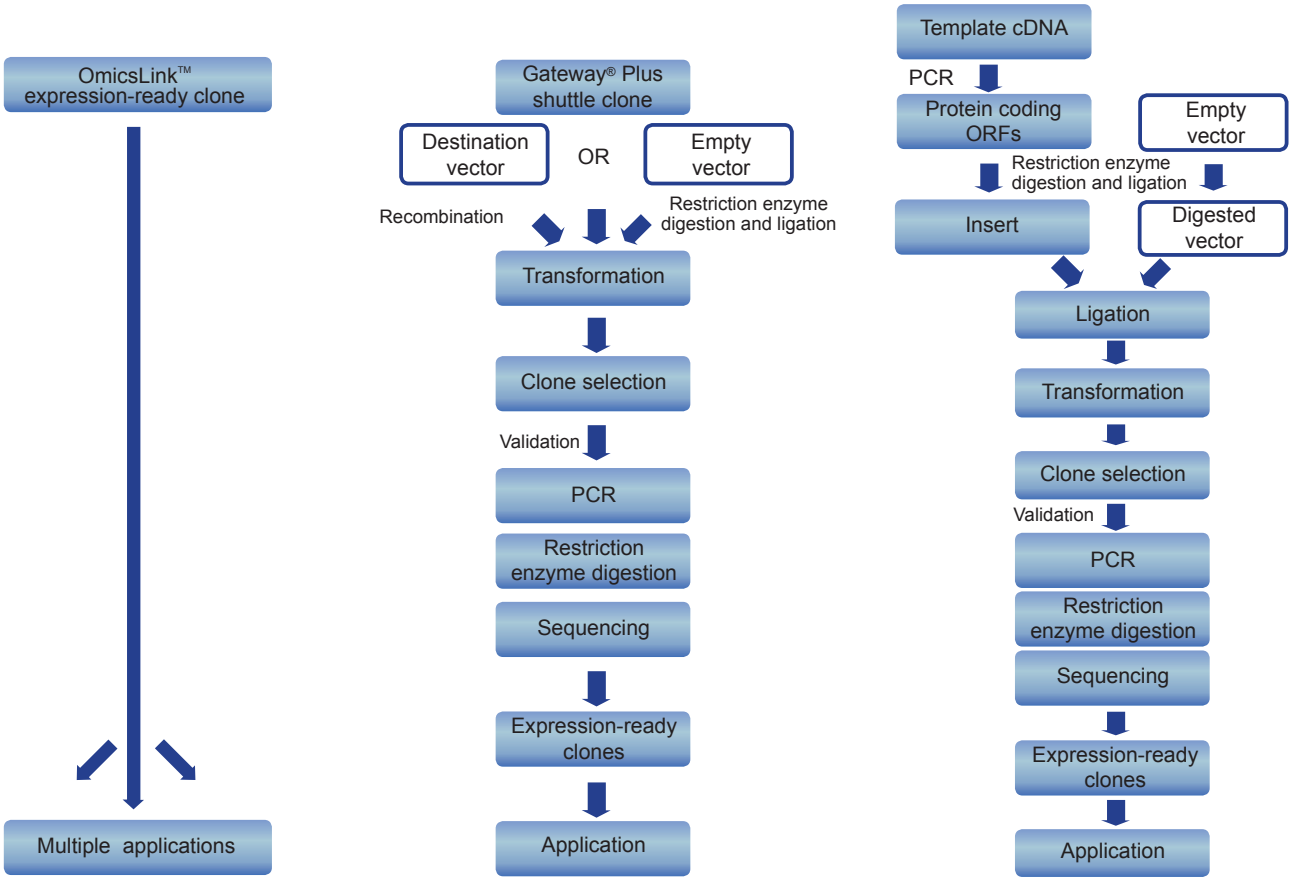
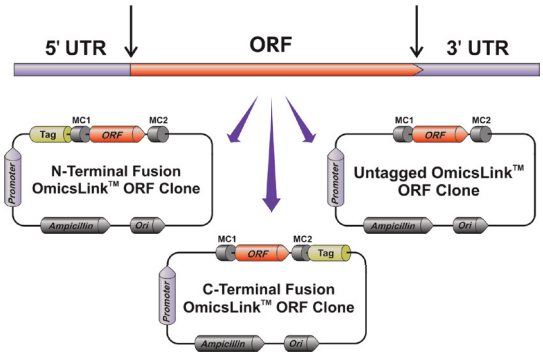


Figure 1. Clone selection guide: Expression-ready vs. other types

OmicsLink™ Expression-Ready ORF cDNA Clones

OmicsLink expression-ready ORF cDNA clones represent the largest collections (over 45,000) of human and mouse full-length protein-coding ORF cDNA clones. They are optimized for protein expression, easy purification and functional assays in a variety of cell systems .



OmicsLink™ expression-ready ORF cDNA clones vs. other clone types

Feature	Expression-Ready ORF cDNA Clone	ORF cDNA Shuttle Clone	Whole Transcript cDNA Template Clone
Product	OmicsLink™ expression-ready ORF cDNA clones	ORFEXPRESS™ Gateway® PLUS shuttle ORF cDNA clones	GeneCopoeia full-length cDNA clones
Protein expression-ready	Yes	No, need several subcloning steps	No, need many subcloning steps (labor intensive)
cDNA insert	ORF only, no 5' and 3' UTRs	ORF only, no 5' and 3' UTRs	Full-length cDNA with 5' and 3' UTRs
Promoter	Numerous promoter choices	No promoter	No promoter
Tag	50+ tag choices	No tag	No tag
Selection marker	Various choices	No selection marker	No selection marker
Ribosomal binding site	Yes (optimized)	Yes (optimized)	Yes (original)
Coding region fully sequenced	Yes	Yes	Yes
Vector type	100+ vector choices for mammalian, bacterial, yeast, insect, lentiviral, cell free systems	ORFEXPRESS - Gateway® PLUS vector (with additional MCS) for recombination or traditional cloning	Non-expression, non-shuttle vector Traditional cloning only, no recombination cloning
Need for destination vector	Not required, expression-ready	Need destination expression vector	Need empty expression vector

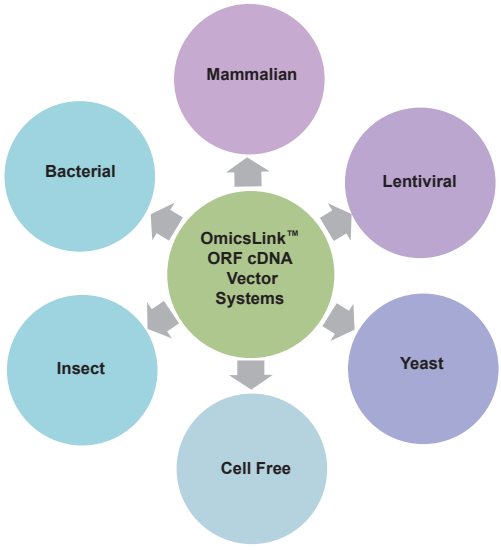
Widest Choices

Source

OmicsLink expression-ready ORF cDNA clones are generated from sequence validated full-length cDNA clones or high quality cDNA libraries. They are constructed in expression vectors using GeneCopoeia's proprietary RecJoin™ cloning technology. With widest choices of over 100 expression vectors and 50 singular or combinational tandem fusion tags, researchers have the flexibility to find the most suitable constructs for their tasks in functional genomics, proteomics, and system biology research. They can either request to have their gene-of-interest cloned into a chosen vector with unique features or simply order from the large collection of GeneCopoeia premade human and mouse expression-ready ORF cDNA clones.

Widest choices of expression systems

- Bacterial (14 vector types)
- Mammalian (35 vector types)
- Lentiviral (48 vector types)
- Yeast (3 vector types)
- Insect (1 vector type)
- Wheat germ cell free (8 vector types)



Full genome coverage

- Human
- Mouse
- Zebra fish

100+ vectors with choices of promoters, fusion tags and selection markers

Promoter	CMV, T7, Tac, EF1α, GAL1, pADH, AcMNPV polyhedrin, custom promoter
Selection marker	Neomycin, puromycin, hygromycin, blasticidin, zeocin
Fusion tag	• Fluorescent tags: eGFP, eYFP, eCFP, mCherry • Multifunctional tags: HaloTag®, AviTag™ • Solubility and purification tags: His6, SUMO, Flag, GST, MBP, 3xFlag • Antibody immunoprecipitation tags: 3xHA, Myc, Flag, 3xFlag • IRES- coexpressed proteins: Avi+IRES-Biotin ligase, Myc+IRES-eGFP, IRES-eGFP, IRES-Neomycin, IRES-Luciferase, etc. • And more
Vector type	Lentiviral and non-viral vectors

Applications

- In vivo and in vitro gene over-expression
- Functional studies using model cell lines or whole model organisms
- Cellular imaging for protein trafficking, localization, immobilization (Fig. 2)
- Transduction into stem, primary and other difficult -to-transfect cells (Fig. 3)
- Functional rescue in shRNA and miRNA studies
- High-throughput screening assays
- Protein-DNA and protein-protein interaction studies
- Protein expression and production

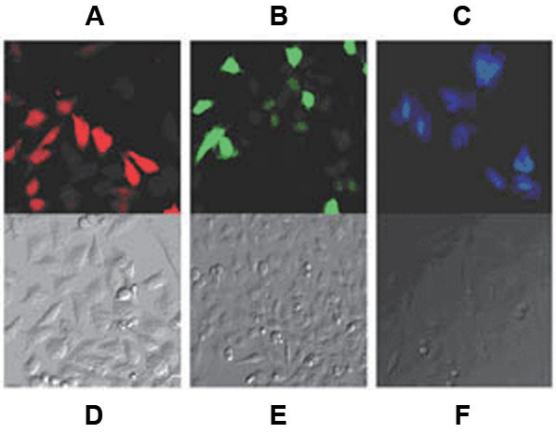


Figure 2. Live cells expressing HaloTag® fusion protein labeled with three different ligands. HeLa cells transiently transfected with HaloTag® pHT2 expression clones were labeled with 5 µM HaloTag® TMR Ligand (Panel A); 10µM HaloTag® diAcFAM Ligand (Panel B); or 25 µM HaloTag® Coumarin Ligand (Panel C).

Guarantee

GeneCopoeia guarantees that all full-length OmicsLink expression clones are free of artificially generated point mutations and frame-shifting mutations including deletions and insertions as well as translation termination mutations (point mutations that result in a premature stop codon).

- All ORFs are fully sequenced
- PCR amplification and size validation
- Enzyme digestion check of the integrity of whole plasmid

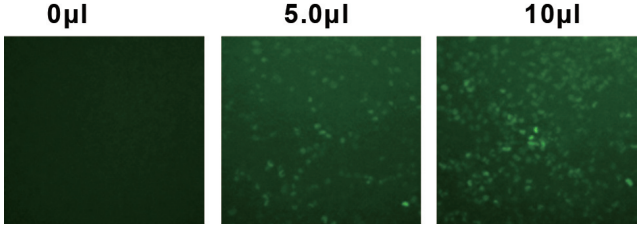


Figure 3. Transduction of H1299 cells with GeneCopoeia lentiviral particles expressing a large gene.
H1299 cells (in 24-well plate) were transduced with indicated amounts of LP-Y3533-Lv122 in the presence of 5 µg/ml of polybrene. The expression of C-terminal eGFP SMARCA4 fusion protein was checked with a fluorescence microscope 72 hours post-transduction.
ID of Y3533: SMARCA4
Length of SMARCA4 coding region: 4944 bp
Length of SMARCA4 eGFP fusion: > 5.6Kp

Advantages

- Ready-to-transfect and ready-to-express
- Test multiple expression systems to achieve the best protein expression at affordable price
  - Up to 80% discount on additional expression constructs in different vectors for the same gene accession number*
  - Overcome difficulties in expression, production and purification with choice of 100+ expression vectors
- Fully sequence-verified

*Contact us for details

Powerful Tags

Fusion tags

GeneCopoeia offers more than 50 singular and tandem tags to meet your expression, purification, visualization, detection and localization needs.

Fusion tag	Purification	Increase solubility	Ab-IP	Cellular labeling	Fluorescent
His	+	+/-	+		
Sumo/His-Sumo	++	++	+		
GST	+	+	+		
MBP	+	++	+		
Flag/3xFlag	+	+/-	+	+	
3xHA				+	++
eGFP/eCFP/eYFP/mCherry				+++	+++
cMyc			+	+	
AviTag™	+		++	++	
His-AviTag™	++		++	++	
HaloTag®	++	++	++	+++	

AviTag™ Technology

The AviTag technology is based on the highly specific biotinylation of the 15 amino acid AviTag by biotin ligase in vitro or in vivo and on the specific and reverse binding of avidin or streptavidin to biotin for immobilizing, purifying and visualizing proteins.

Applications

- Purify AviTag-fusion proteins using monomeric avidin
- Use immobilized AviTag-fusion proteins for high-throughput screening and protein-protein interaction studies using surface plasmon resonance
- Visualize Avi-Tag-fusion proteins using avidin or streptavidin conjugates with western blots and MHC-tetramers for staining and sorting T cells

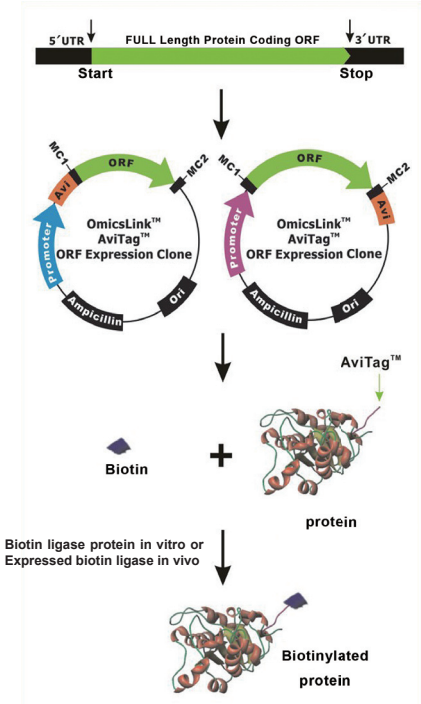


Figure 4. Expression and biotinylation of proteins with AviTag

HaloTag® Technology

The HaloTag® protein is a geneteically engineered derivative of a dehalogenase. It efficiently forms a covalent bond with various synthetic HaloTag® ligands. The 34 kDa monomeric protein can be fused at either the N- or C-terminus to proteins of interest and enables tagged proteins to be labeled with fluorophores for both in vitro and in vivo imaging or with affinity agents for purification.

Applications

- Multicolor cell imaging with either live or fixed cells
- Facilitating protein purification
- Enhancing protein expression and solubility

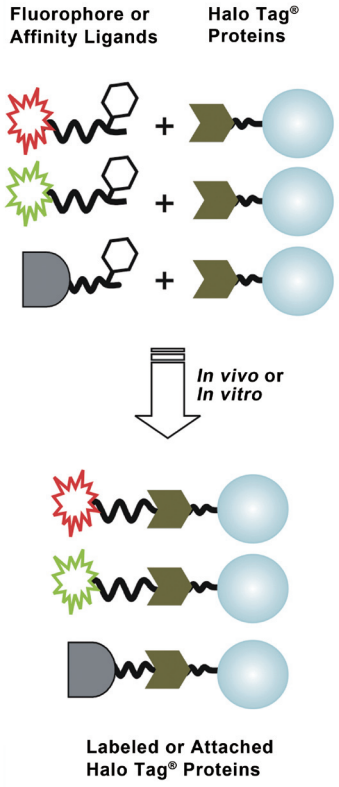


Figure 5. Covalent and specific binding of a variety of synthetic reporter and affinity ligands to HaloTag® proteins allows detection, affinity-binding or solid-phase fixation of proteins of interest.

Internal Ribosome Entry Site (IRES)

The IRES technology allows the coordinated co-expression of two genes using the same promoter in a single vector. Virtually any combination of genes is possible. For example, you can monitor the delivery of one gene by using a fluorescent reporter of a second gene or express a protein of interest and simultaneously biotinylate it with biotin ligase expressed on the same vector.

Applications

- Monitor gene delivery efficiency
- Monitor protein modification
- In vivo biotinylation
- Stable transfection

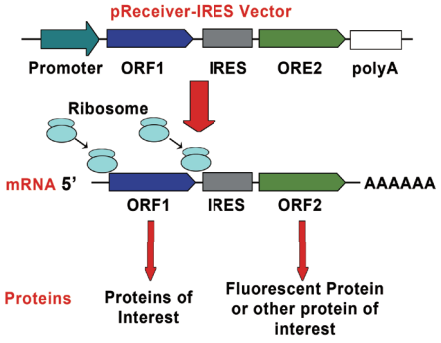


Figure 6. Biocistronic expression of two genes with IRES.

OmicsLink™ Anti-Tag Antibodies

GeneCopoeia offers OmicsLink anti-tag antibodies to meet customers' needs of working with tagged fusion proteins expressed using the OmicsLink ORF cDNA clones.

- Anti-GFP antibody
- Anti-mCherry antibody
- Anti-GST antibody
- Anti-D* antibody
- Anti-Myc antibody
- Anti-HA antibody
- Anti-His antibody

*Also known as flag tag

Shuttle Clones

Depending on the application and budget, GeneCopoeia offers cDNA clones that meet every researcher's protein expression needs.

ORF*EXPRESS* Gateway® PLUS ORF cDNA Shuttle Clones

ORF*EXPRESS* Gateway® PLUS shuttle clones offer both recombination cloning and multiple cloning sites (MCS) for traditional cloning.

- The presence of attL1 and attL2 sites allow rapid and simple transfer of ORF inserts into any Invitrogen Gateway® destination expression vector
- Flanking the ORFs, MCS make these clones compatible with traditional cloning systems that utilize classical restriction enzyme digestion and ligation cloning methods
- 25,000 human and 20,000 mouse genes are covered
- Available with or without stop codons
- Ribosomal binding sites (Shine Dalgarno and Kozak Sequence) for optimal translational context

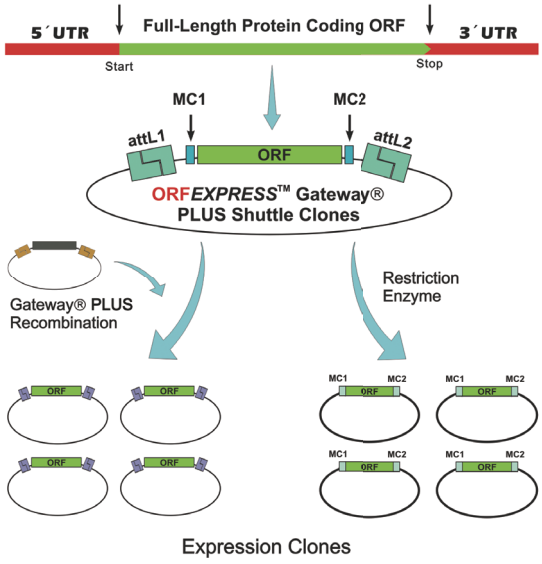


Figure 7. Gateway® PLUS shuttle ORF cDNA clones can be used for both recombination as well as traditional restriction digestion ligation cloning.

ORFeome Collaboration ORF cDNA Clones

As an official member of the ORFeome Collaboration, GeneCopoeia carries and sells ORFeome ORF cDNA clones. These ORF clones have been generated by the contribution from various research institutes including Dana Farber Cancer Institute-Center for Cancer Systems Biology, NCBI, WISI/HAVANA group and IMAGE Consortium.

- 8000 human ORFeome collaboration clones
- Gateway® entry vectors for transferring into any type of Gateway® compatible destination expression vector
- No multiple cloning sites for traditional cloning

Full-length whole transcript cDNA template clone collection

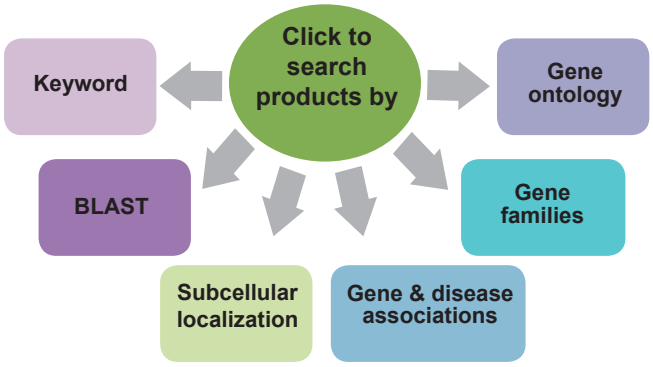
GeneCopoeia offers 16,000 human full-length whole transcript cDNA template clones. These clones include the 5' and 3' UTRs and involve tedious multiple cloning steps for obtaining an expression-ready construct.

To save time and publish faster, GeneCopoeia recommends using OmicsLink Expression-Ready ORF cDNA clones.

- Ready-to-transfect and ready-to-express
- Overcome difficulties in expression, production and purification with choice of 100+ expression vectors
- Fully sequence-verified

Simple and multiple search options

- Keywords
- BLAST
- Gene or protein families and groups
- Gene and disease associations
- Gene ontology classification
- Subcellular localization



Browse gene families and disease associations

Based on GeneCopoeia's proprietary literature mining algorithm, over 10,000 genes have been associated with major disease categories. Browsing these associations using the browsing function on the GeneCopoeia website search page makes finding genes of interest straightforward and convenient.

Gene Families	ORF cDNAs
Cytokines	315
Cytokine receptors	152
Druggable target genes	6245
G protein-coupled receptors	718
Histone modification enzymes	38
Histone proteins	66
Ion channels	463
Membrane-bound proteins	2138
Nuclear hormone receptors	105
Proteases	625
Protein kinases	933
Protein phosphatases	293
Surface antigens (CD)	263
Transcription factors	1096
Organelle markers	77
Other kinases	201

Disease Families	ORF cDNAs
Cardiovascular diseases	1596
Congenital anomalies and genetic diseases	3978
Digestive system diseases	864
Diseases of the blood and blood-forming organs	1886
Endocrine, metabolic and nutrition diseases	1784
Immunologic diseases	3644
Infectious diseases	3536
Mental disorders	1805
Musculoskeletal system diseases	946
Neoplasms	8950
Nervous system and sense organs	2404
Respiratory system diseases	565
Urologic and genital diseases	1304
Skin and connective tissue diseases	866
Symptoms and general pathology	2022

Custom Services

Custom gene synthesis, mutagenesis, cloning

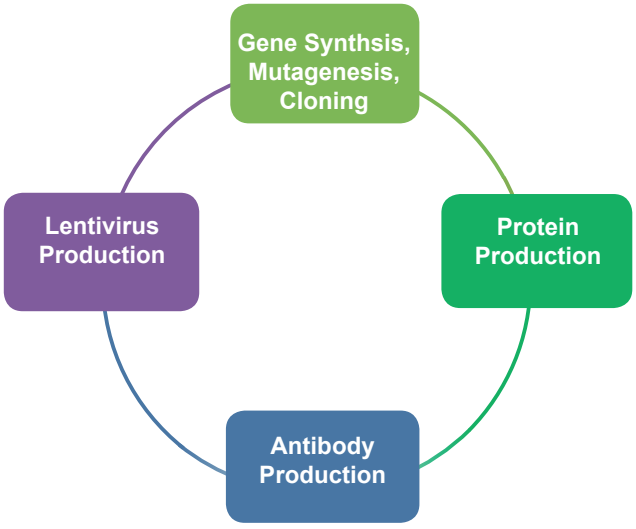
GeneCopoeia offers de novo gene synthesis services for any gene that is not currently available. GeneCopoeia can also customize sequence composition, splicing variants and functional domains or fragments.

Guaranteeing 100% sequence accuracy, GeneCopoeia scientists use codon optimization techniques to ensure high levels of expression in host cells. Synthesized genes can be delivered in any of more than 100 different vector types at no additional custom service fee.

Custom lentiviral particle production

Lentiviral vectors are potent vehicles for delivering genes into a wide range of cell types including difficult-to-transfect and non-dividing cells. However, producing, concentrating and titrating lentiviral particles are time consuming and require experience to achieve high titers and consistent results.

GeneCopoeia's experienced scientific expertise consistently produces high quality and high-titer crude or purified viral particles to meet your research need in an efficient and cost-effective way.



Protein production

GeneCopoeia's protein production facility uses a range of host-cell and cell-free expression systems including E. coli, insect, yeast, CHO and mammalian cells as well as wheat germ cell-free systems. Protein expression, solubility and yield are significantly increased by using a variety of unique fusion tags that are not available in the market.

Antibody production

GeneCopoeia custom services for poly- and monoclonal antibody production specializes in using recombinant proteins and different animal species for unmatched low costs and short delivery times.

Each case is unique. Contact us today to discuss how GeneCopoeia can help you with your specific research needs.

Related Products

Coupled with GeneCopoeia cDNA clone collections, supporting and related products are also available to meet the protein expression and functional genomics research needs.

Category	Product	Description
Lentiviral System	Lentifect™ Lentivirus Production Services	High-titer crude or purified lentiviral particles produced by experts and ready-for-transduction
	Lenti-Pac™ Lentiviral Packaging Kits	• Optimized lentiviral packaging plasmid mix • eGFP control clone • EndoFectin™ Lenti, a new transfection reagent developed to work with lentiviral-based constructs • TiterBoost™, a reagent that further increases titers by 5-10 fold
	Lenti-Pac™ 293Ta Lentiviral Packaging Cell Line	For high-titer lentiviral production using Lenti-Pac™ lentiviral packaging kits
qPCR Kits and Primers	All-in-One™ qPCR Kits and Primers	• Universal reaction conditions for all qPCR primers • Validated gene-specific primers for human, mouse and rat
Transfection Reagents	EndoFectin™ Lenti EndoFectin™ CHO EndoFectin™ Plus EndoFectin™ MAX	Fully optimized and validated for specific cell types
Anti-Tag Antibodies	OmicsLink™ Antitag Antibodies	Monoclonal mouse IgG anti-tag antibodies that bind to 6xHis-, GFP-, mCherry-, GST-, D*-, HA-, or Myc-tagged fusion protein
shRNA Expression Clones	OmicsLink™ shRNA Expression Clones	• Genome-wide coverage of human, mouse and rat • Four shRNA constructs per target gene • Guaranteed knockdown effect of 70% determined by qRT-PCR
Pre-miRNA Expression Clones	miExpress™ Precursor miRNA Expression Clones	• Fully sequenced and optimized for high expression and maturation of miRNA inside cells • Full coverage of human, mouse and rat miRNA in miRBase database
miRNA Inhibitor Expression Clones	miArrest™ miRNA Inhibitor Expression Clones	• Superior potency, long-lasting inhibition and extremely low cell toxicity • Full coverage of human, mouse and rat miRNA in miRBase database
miRNA 3'UTR Target Expression Clones	miTarget™ miRNA 3'UTR Target Expression Clones	• Genome-wide coverage of human, mouse and rat miRNA 3'UTR target sequences • Dual luciferase reporters or dual reporters in a single vector

*Also known as flag tag

Selected Expression Vectors

Mammalian Expression Vectors with CMV Promoter and Neomycin Selection

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-M01	CMV	Mammalian	Neomycin	N-His	N/A
pReceiver-M51	CMV	Mammalian	Neomycin	C-His+IRES-eGFP	N/A
pReceiver-M77	CMV	Mammalian	Neomycin	C-His	N/A
pReceiver-M67	CMV	Mammalian	Hygromycin	N/A	N/A
pReceiver-M02	CMV	Mammalian	Neomycin	N/A	N/A
pReceiver-M68	CMV	Mammalian	Puromycin	N/A	N/A
pReceiver-M29	CMV	Mammalian	Neomycin	N-eGFP	N/A
pReceiver-M03	CMV	Mammalian	Neomycin	C-eGFP	N/A
pReceiver-M15	CMV	Mammalian	Neomycin	N-eYFP	N/A
pReceiver-M16	CMV	Mammalian	Neomycin	C-eYFP	N/A
pReceiver-M32	CMV	Mammalian	Neomycin	N-eCFP	N/A
pReceiver-M33	CMV	Mammalian	Neomycin	C-eCFP	N/A
pReceiver-M04	CMV	Mammalian	Neomycin	N-GST	EK
pReceiver-M05	CMV	Mammalian	Neomycin	N-Avi	N/A
pReceiver-M48	CMV	Mammalian	Neomycin	N-Avi+IRES-Biotin ligase	N/A
pReceiver-M62	CMV	Mammalian	Neomycin	C-Avi+IRES-Biotin ligase	N/A
pReceiver-M17	CMV	Mammalian	Neomycin	C-Avi	N/A
pReceiver-M06	CMV	Mammalian	Neomycin	N-3xHA	N/A
pReceiver-M07	CMV	Mammalian	Neomycin	C-3xHA	N/A
pReceiver-M08	CMV	Mammalian	Neomycin	C-3xHA-His	N/A
pReceiver-M43	CMV	Mammalian	Neomycin	N-Myc	N/A
pReceiver-M45	CMV	Mammalian	Neomycin	C-3xHA+IRES2-eGFP	N/A
pReceiver-M09	CMV	Mammalian	Neomycin	C-Myc	N/A
pReceiver-M10	CMV	Mammalian	Neomycin	C-Myc-His	N/A
pReceiver-M72	CMV	Mammalian	Neomycin	C-Myc+IRES-eGFP	N/A
pReceiver-M11	CMV	Mammalian	Neomycin	N-Flag	N/A
pReceiver-M12	CMV	Mammalian	Neomycin	N-3XFlag	N/A
pReceiver-M13	CMV	Mammalian	Neomycin	C-Flag	N/A
pReceiver-M46	CMV	Mammalian	Neomycin	C-Flag+IRES-eGFP	N/A
pReceiver-M14	CMV	Mammalian	Neomycin	C-3XFlag	N/A
pReceiver-M49	CMV	Mammalian	Neomycin	N-HaloTag	Tev proteasa
pReceiver-M50	CMV	Mammalian	Neomycin	C-HaloTag	Tev proteasa
pReceiver-M55	CMV	Mammalian	Neomycin	N-mCherry	N/A
pReceiver-M56	CMV	Mammalian	Neomycin	C-mCherry	N/A
pReceiver-M61	CMV	Mammalian	Neomycin	IRES2-eGFP	N/A

Insect Expression Vector

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-I01	AcMNPV polyhedrin	Insect cell	N/A	N-His	Tev

Lentiviral Expression Vectors with CMV Promoter for Stem,Primary and OtherDifficult-to-Transfect Cells

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-Lv01	CMV	Stem/primary cell	No	N/A	N/A
pReceiver-Lv105	CMV	Stem/primary cell	Puromycin	N/A	N/A
pReceiver-Lv81	CMV	Stem/primary cell	N/A	IRES2-eGFP	N/A
pReceiver-Lv36	CMV	Stem/primary cell	No	+IRES-luciferase	N/A
pReceiver-Lv80	CMV	Stem/primary cell	N/A	IRES2-mCherry	N/A
pReceiver-Lv76	PGK	Stem/primary cell	N/A	IRES2-eGFP	N/A
pReceiver-Lv78	CMV	Stem/primary cell	N/A	IRES2-eCFP	N/A
pReceiver-Lv79	CMV	Stem/primary cell	N/A	IRES2-eYFP	N/A
pReceiver-Lv40	CMV	Stem/primary cell	Neomycin	IRES-Neomycin	N/A
pReceiver-Lv21	CMV	Stem/primary cell	Neomycin	N/A	N/A
pReceiver-Lv02	CMV	Stem/primary cell	No	C-3xHA	N/A
pReceiver-Lv52	CMV	Stem/primary cell	N/A	C-3xHA+IRES2-eGFP	N/A
pReceiver-Lv06	CMV	Stem/primary cell	Neomycin	C-3xHA	N/A
pReceiver-Lv23	CMV	Stem/primary cell	Neomycin	N-Flag	N/A
pReceiver-Lv03	CMV	Stem/primary cell	No	C-Flag	N/A
pReceiver-Lv53	CMV	Stem/primary cell	N/A	C-Flag+IRES2-eGFP	N/A
pReceiver-Lv07	CMV	Stem/primary cell	Neomycin	C-Flag	N/A
pReceiver-Lv19	CMV	Stem/primary cell	Neomycin	N-eGFP	N/A
pReceiver-Lv04	CMV	Stem/primary cell	No	C-eGFP	N/A
pReceiver-Lv08	CMV	Stem/primary cell	Neomycin	C-eGFP	N/A
pReceiver-Lv20	CMV	Stem/primary cell	Neomycin	N-eYFP	N/A
pReceiver-Lv05	CMV	Stem/primary cell	No	C-eYFP	N/A
pReceiver-Lv09	CMV	Stem/primary cell	Neomycin	C-eYFP	N/A
pReceiver-Lv34	CMV	Stem/primary cell	Neomycin	N-eCFP	N/A
pReceiver-Lv61	CMV	Stem/primary cell	No	C-eCFP	N/A
pReceiver-Lv62	CMV	Stem/primary cell	Neomycin	C-eCFP	N/A
pReceiver-Lv68	CMV	Stem/primary cell	N/A	C-Avi + IRES-Biotin ligase	N/A
pReceiver-Lv35	CMV	Stem/primary cell	No	N-Avi + IRES-Biotin ligase	N/A
pReceiver-Lv26	CMV	Stem/primary cell	Neomycin	N-Avi	N/A
pReceiver-Lv10	CMV	Stem/primary cell	Neomycin	C-Avi	N/A
pReceiver-Lv25	CMV	Stem/primary cell	Neomycin	N-Myc	N/A
pReceiver-Lv17	CMV	Stem/primary cell	Neomycin	C-Myc	N/A
pReceiver-Lv18	CMV	Stem/primary cell	Neomycin	C-Myc-His	N/A
pReceiver-Lv46	CMV	Stem/primary cell	N/A	C-Myc+IRES-luciferase	N/A
pReceiver-Lv77	PGK	Stem/primary cell	N/A	C-Myc+ IRES2-eGFP	N/A
pReceiver-Lv48	CMV	Stem/primary cell	N/A	C-Myc+ IRES2-eYFP	N/A
pReceiver-Lv75	CMV	Stem/primary cell	N/A	C-Myc+ IRES2-mCherry	N/A
pReceiver-Lv45	CMV	Stem/primary cell	N/A	C-Myc+ IRES2-eCFP	N/A
pReceiver-Lv47	CMV	Stem/primary cell	Neomycin	C-Myc+IRES-Neomycin	N/A
pReceiver-Lv70	CMV	Stem/primary cell	N/A	C-Myc+ IRES2-eGFP	N/A
pReceiver-Lv64	CMV	Stem/primary cell	Neomycin	N-HaloTag	Tev protease*
pReceiver-Lv65	CMV	Stem/primary cell	Neomycin	C-HaloTag	Tev protease*
pReceiver-Lv71	CMV	Stem/primary cell	Puromycin	N-mCherry	N/A
pReceiver-Lv72	CMV	Stem/primary cell	Neomycin	C-mCherry	N/A
pReceiver-Lv73	CMV	Stem/primary cell	N/A	C-His+ IRES-eGFP	N/A
pReceiver-Lv41	EF1α†	Stem/primary cell	Neomycin	N/A	N/A
pReceiver-Lv67	CMV	Stem/primary cell	Puromycin	N/A	N/A
pReceiver-Lv66	CMV	Stem/primary cell	Hygromycin	N/A	N/A

*Tev protease site
†EF1α promoter

Selected Expression Vectors

Yeast Expression Vectors

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-Y01	GAL1	S. cerevisiae	N/A	C-His	N/A
pReceiver-YAD	pADH	Yeast	N/A	GAL4AD	N/A
pReceiver-YBD	pADH	Yeast	N/A	GAL4DB	N/A

Bacterial Expression Vectors

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-B01	T7	*E. Coli*	N/A	N-His	N/A
pReceiver-B31	T7	*E. Coli*	N/A	C-His	N/A
pReceiver-B02	T7	*E. Coli*	N/A	N/A	N/A
pReceiver-B03	T7	*E. Coli*	N/A	N-GST	Tev
pReceiver-B04	T7	*E. Coli*	N/A	N-GST	EK
pReceiver-B05	Tac	*E. Coli*	N/A	N-GST	Tev
pReceiver-B06	Tac	*E. Coli*	N/A	N-GST	EK
pReceiver-B07	Tac	*E. Coli*	N/A	N-MBP	Tev
pReceiver-B08	Tac	*E. Coli*	N/A	N-MBP	EK
pReceiver-B09	T7	*E. Coli*	N/A	N-Avi	N/A
pReceiver-B10	Tac	*E. Coli*	N/A	N-Flag	N/A
pReceiver-B11	Tac	*E. Coli*	N/A	N-His	N/A
pReceiver-B12	Tac	*E. Coli*	N/A	HisSUMO	SUMO protease
pReceiver-B13	T7	*E. Coli*	N/A	HisSUMO	SUMO protease

Wheat Germ Cell-Free Expression Vectors

Vector	Promoter	Host Cell	Selection Marker	Tag	Protease Site
pReceiver-WG02	T7	cell free	N/A	N-His	Factor Xa
pReceiver-WG03	T7	cell free	N/A	N-HisSUMO	CoolCutter™
pReceiver-WG04	T7	cell free	N/A	N-AviSUMO	CoolCutter™
pReceiver-WG05	T7	cell free	N/A	N-HisAviSUMO	CoolCutter™
pReceiver-WG09	T7	cell free	N/A	HisGST	TEV
pReceiver-WG16	T7	cell free	N/A	N/A	N/A
pReceiver-WG31	T7	cell free	N/A	N-HisSUMOAvi	CoolCutter™
pReceiver-WG33	T7	cell free	N/A	N-TrxHisSUMO	CoolCutter™

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GLuc-ON™ Promoter Reporter Clones

Overview

Using a secreted and robust Gaussia Luciferase (GLuc) as the reporter, GeneCopoeia GLuc-ON™ promoter clones are designed to detect the real-time activities of over 20,000 human promoters using live cell assays.

Each transfection-ready promoter clone contains 1.0-1.3 kb insert, corresponding to the 5'-flanking sequence located approximately 1.3 kb upstream and up to 200bp downstream of the transcription initiation site of a specific human gene. This insert is placed upstream of the GLuc reporter gene. Since the putative cis-acting enhancer elements are expected to exist in the cloned promoter region, the luciferase activity observed during the reporter assay closely resembles the actual promoter regulation of these genes within human cells.

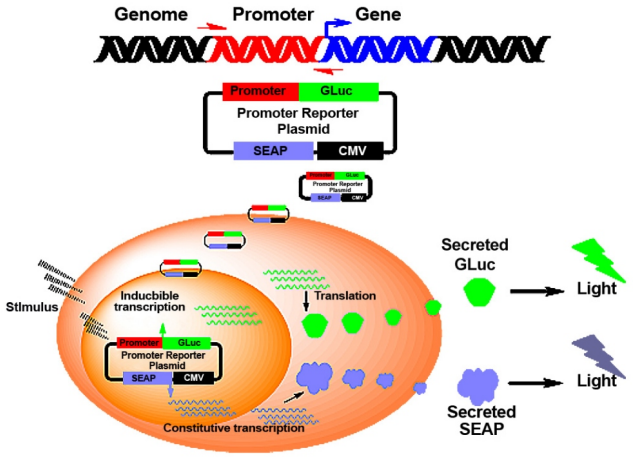

Figure 1. How GLuc-ON promoter clones work

Vector	Reporter gene	Tracking gene	Vector type
pEZX-PG04	*Gaussia* luciferase(Gluc)	Secreted alkaline phosphatase (SEAP)	Non-viral
pEZX-PG02	*Gaussia* luciferase(Gluc)	N/A*	Non-viral
pEZX-PF02	eGFP	N/A*	Non-viral
pEZX-PM02	mCherry	N/A*	Non-viral
pEZX-LvPG04	*Gaussia* luciferase(Gluc)	Secreted alkaline phosphatase (SEAP)	Lentiviral
pEZX-LvPG02	*Gaussia* luciferase(Gluc)	N/A*	Lentiviral
pEZX-LvPF02	eGFP	N/A*	Lentiviral
pEZX-LvPM02	mCherry	N/A*	Lentiviral

*A separate vector is available for SEAP expression.

Advantages

Live cell assays

- Naturally secreted Gluc reporter
- No lysis of the cells is necessary
- Save samples, reduce variations, and simplify experiments for applications such as pulse-chase analysis, etc.

Real-time study

- Data is generated quickly
- Closely resembles real-time activities

Dual secreted reporter system

- Secreted GLuc and SEAP
- Enables transfection-normalization for true cross-sample comparison

High-throughput compatible

- Group or pathway study compatible
- High sample number compatible

High sensitivity

- Gluc is 1000-fold more sensitive than firefly or *Renilla* luciferase

Convenience

- All promoter clones are transfection-ready

GeneCopoeia™
Expressway to Discovery

GLuc-ON™ Promoter Reporter Clones

Gaussia luciferase

GLuc-ON promoter clones use a modified GLuc (mGLuc) as the reporter gene, which generates a highly stable signal and overcomes the quick signal decay commonly observed with humanized wild type GLuc (wtGLuc).

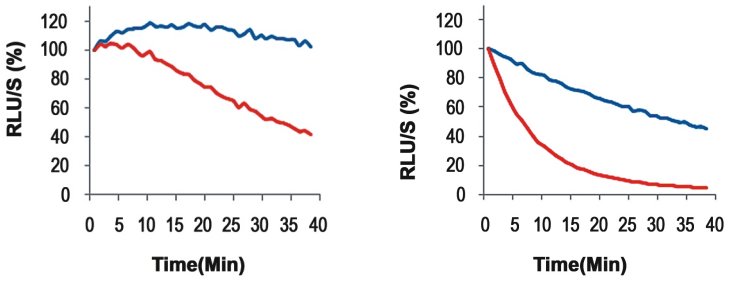

Figure 2. Signal stability of mGLuc (blue) and wtGLuc (red). Left: assay buffer with a stabilizer; Right: regular assay buffer

Dual-reporter system

Dual-reporter vectors are available for the GLuc-ON promoter clones. The secondary reporter, secreted Alkaline Phosphatase (SEAP), serves as an internal control and enables transfection normalization for accurate cross-sample comparison.

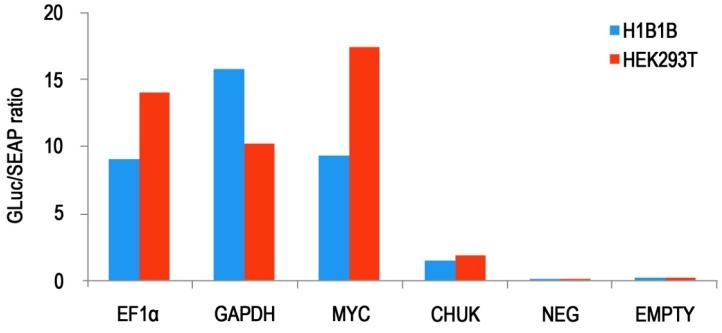

Figure 3. Normalized promoter activities in H1B1B and HEK293T cells. Dual-reporter promoter clones or controls were transfected into two cell lines in duplicates. Samples were analyzed 24 hrs (HEK293T) and 48 hrs (H1B1B) after transfection. NEG (containing non-promoter sequence) and EMPTY (no promoter in the vector) are negative controls.

To order

To search and order promoter clones, please visit www.genecopoeia.com

Related Products

- GLuc-ON™ SEAP Expression Clone
- GLuc-ON™ Promoter Clone Positive and Negative Control Vectors
- Secrete-Pair™ Dual Luminescence Assay Kit
- EndoFectin™ Transfection Reagents

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GeneCopoeia™ Expressway to Discovery

OmicsLink™ shRNA Clone Collections

Overview

OmicsLink™ shRNA clone collections consist of lentiviral and other mammalian expression vector-based small hairpin RNA (shRNA) clones against genome-wide target genes from human, mouse and rat. A set of four expression constructs for every target gene ensures high knockdown efficiency with minimal off-target effects.

GeneCopoeia provides four shRNA constructs for every target gene and guarantees that at least one of the four will have a knockdown effect of 70% on corresponding gene expression as determined by qRT-PCR.

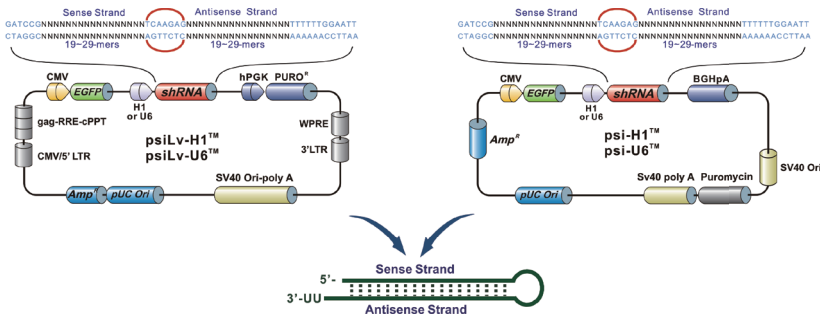

Figure 1. Lentiviral expression vector–based shRNA clones with H1 or U6 promoter.

Selected publications

Wong, L. C. et al. (2010) Fully-automated image processing software to analyze calcium traces in populations of single cells. Cell Calcium, 48 (5): 270-274

St John, MA et al (2009) Proinflammatory mediators upregulate snail in head and neck squamous cell carcinoma. Clin Cancer Res 15: 6018

Kim, YD et al (2011) NSrp70 is a novel nuclear speckle-related protein that modulates alternative pre-mRNA splicing in vivo. Nucl. Acids Res. (2011) doi: 10.1093/nar/gkq1267

Gupta, S. et al. (2010) HSP72 Protects Cells from ER Stress-induced Apoptosis via Enhancement of IRE1α-XBP1 Signaling through a Physical Interaction. PLoS Biol 8 (7): e1000410

Advantages

Guaranteed knockdown

Four shRNA sequences are selected through a proprietary algorithm
Guarantee at least one of the four will have a knockdown effect of 70% on corresponding gene expression as determined by qRT-PCR

Versatile deliveries

Available in expression plasmid or lentiviral particles for gene silencing in virtually all cell types including difficult-to-transfect and non-dividing cells

Markers and reporters

Enable stable cell line selection and expression verification

Fully sequenced

The expression cassettes of all shRNA clones are fully sequenced

GeneCopoeia™
Expressway to Discovery

OmicsLink™ shRNA Clone Collections

Vector list

Vector	Promoter	Selection marker	Reporter gene	Viral type
psiLv-H1	H1	Puromycin	eGFP	Lenti
psiLv-U6	U6	Puromycin	eGFP	Lenti
psiLv-mH1	H1	Puromycin	mCherry	Lenti
psiLv-mU6	U6	Puromycin	mCherry	Lenti
psiLV-nH1	H1	Puromycin	N/A	Lenti
psiLV-nU6	U6	Puromycin	N/A	Lenti
psi-H1	H1	Puromycin	eGFP	N/A
psi-U6	U6	Puromycin	eGFP	N/A
psi-mH1	H1	Puromycin	mCherry	N/A
psi-mU6	U6	Puromycin	mCherry	N/A
psi-nH1	H1	Puromycin	N/A	N/A
psi-nU6	U6	Puromycin	N/A	N/A

Related products

Product	Description
Lentifect™ Custom Lentivirus Production Services	Up to 10^{10} copies/ml, crude or purified lentiviral particles
Lenti-Pac™ HIV or FIV Expression Packaging Kits	HIV or FIV-based lentiviral packaging plasmids, EndoFectin™ Lenti Transfection Reagent, eGFP control clone, TiterBoost™ Reagent
293Ta Lentiviral Packaging Cell Line	1.5 x 10^6 cells
GCI-L3 Chemically Competent E. coli Cells	Competent cells optimized for lentiviral expression clones
OmicsLink™ Lentiviral ORF Expression Clones	45,000 human and mouse clones available in lentiviral and non-viral expression vectors
miExpress™ Precursor miRNA Expression Clones	1048 human, 672 mouse, and 408 rat clones available in lentiviral and non-viral expression vectors

To order

To search and order shRNA clones, please visit www.genecopoeia.com.

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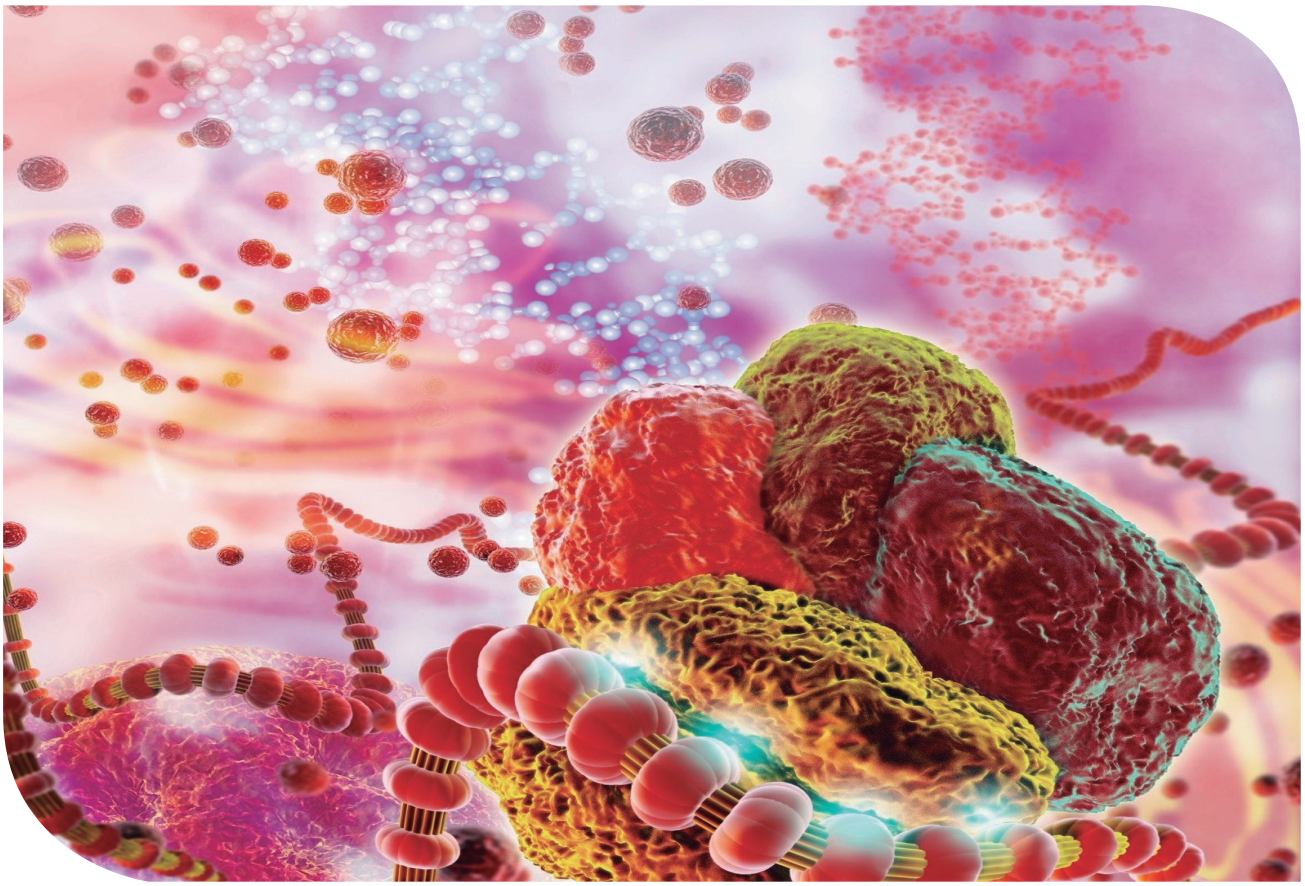
GeneCopoeia™ Expressway to Discovery

MicroRNA Solutions



OverExpression
miExpress™ miRNA Precursor Clones

Inhibition
miArrest™ miRNA Inhibitor Clones/Oligos

Target Validation
miTarget™ miRNA 3' UTR Target Clones

Quantitation and Profiling
miProfile™ miRNA qPCR Arrays
All-in-One™ miRNA qPCR Primers
All-in-One™ miRNA qRT-PCR Kits

GeneCopoeia™
Expressway to Discovery

Mechanism

Introduction

MicroRNAs (miRNAs) are small non-coding RNAs that regulate gene expression at the post-transcriptional level. They regulate gene expression by binding to the 3' untranslated regions (3' UTRs) of targeted mRNAs specifically, which results in either translation suppression or mRNA cleavage and degradation. Usually 21-23 nucleotides in length, microRNAs are important modulators in cellular pathways and are highly conserved in eukaryotic organisms. Irregularities in miRNA-regulated gene expression have been found to be associated with cancers, cardiovascular disorders and a variety of other diseases.

Mechanism

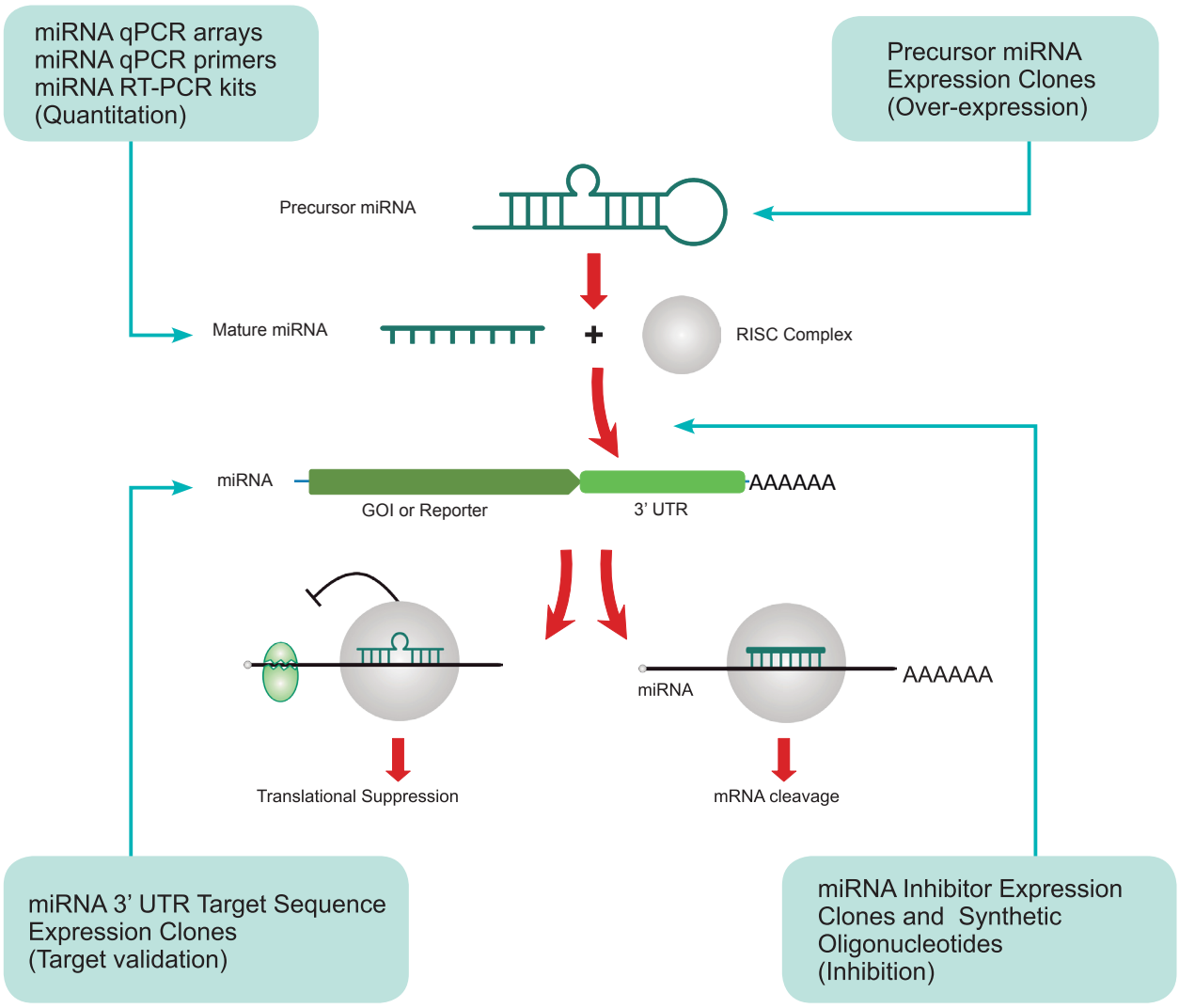


Figure 1. miRNA mechanism and GeneCopoeia comprehensive miRNA solutions. GOI: gene of interest.

Product Portfolios

Committed to serve researchers in the functional genomics and proteomics area, GeneCopoeia provides comprehensive tools and services for miRNA research.

Product	Expressway to Discovery
miExpress™ Precursor miRNA Expression Clones	Over-express miRNAs for gain of function studies
miArrest™ miRNA Inhibitor Expression Clones and Synthetic Oligonucleotides	Inhibit miRNAs for loss of function studies
miTarget™ miRNA 3' UTR Target Sequence Expression Clones	human, mouse, rat and custom 3'UTR clones Validate miRNAs and their gene targets (3'UTR)
miProfile™ miRNA qPCR Arrays	Whole-genome or focused group profiling of miRNA expression using validated primers and robust RT-PCR conditions
All-in-One™ miRNA qPCR primers	Validated human, mouse and rat primers Amplify mature miRNAs to quantitate and study their expression
All-in-One™ miRNA qRT-PCR Detection Kits	SYBR® Green-based qRT-PCR kits Detect mature miRNAs and study their expression profiles
Secrete-Pair™ Dual Luminescence Assay Kits	Analyze the activities of Gaussia Luciferase and Secreted Alkaline Phosphatase of a dual-reporter system side-by-side using the same sample from the cell culture medium. Optimized for use with miTarget 3' UTR target clones
Luc-Pair™ miR Luciferase Assay Kits	Sequential analysis of dual luciferase reporters, optimized for use with miTarget™ miRNA 3' UTR target expression clones. Detect changes in luciferase expression for miRNA target validation

Benefits

Complete solutions

for human, mouse and rat miRNA functional analysis and quantitation

Flexible delivery options

for choices of long-term or short-term miRNA study in virtually all cell types

Reliable design and validated tools

for effective modulation and accurate quantitation of miRNA function

Precursors

miExpress™ Precursor miRNA Expression Clones

Over-expression of miRNA in addition to endogenous miRNA enhances miRNA regulation and suppresses target protein translation.

Available in both viral and non-viral vectors, miExpress™ precursor miRNA expression clones allow stable transduction or transient transfection of miRNA into virtually all cell types, including difficult-to-transfect and non-dividing cells.

Vector	Promoter	Selection marker	Reporter gene	Viral type
pEZX-MR01	H1	Neomycin	eGFP	Lenti
pEZX-MR03	CMV	Puromycin	eGFP	Lenti
pEZX-MR04	CMV	Puromycin	eGFP	N/A

miRNA clones can be purchased as either individual clones or clone sets.

Full coverage
- Human, mouse and rat

Flexible delivery
- Lentiviral or non-viral vectors

Optimized expression
- Fully sequence-verified
- Optimized for high expression of precursor miRNAs and mature miRNAs inside cells

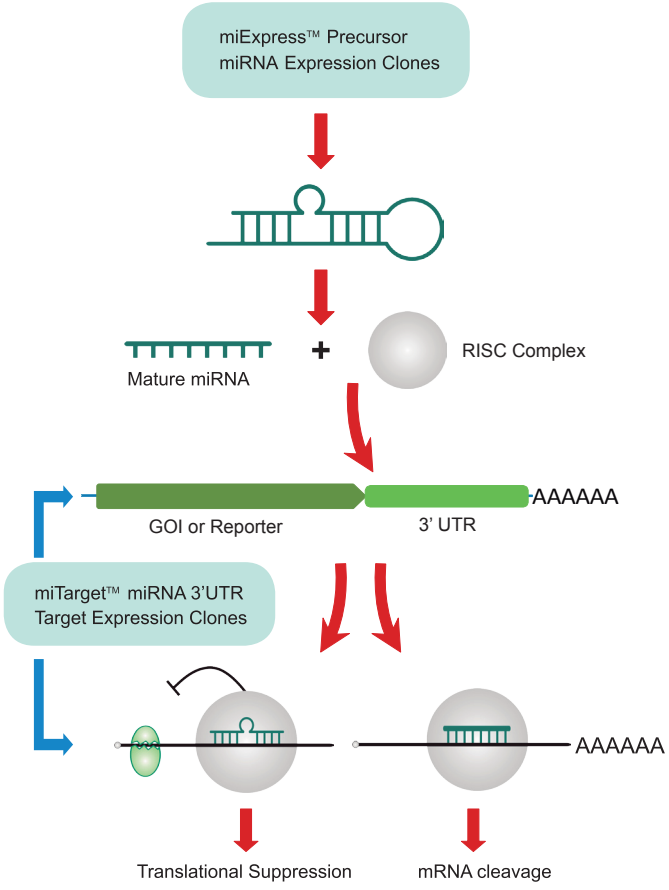


Figure 2. Roles of miExpress™ precursor miRNA and miTarget™ 3' UTR target clones in miRNA regulation studies.

Inhibitors

miArrest™ miRNA Inhibitor Expression Clones and Synthetic Oligonucleotides

Available as lentiviral and non-viral vector-based expression clones or synthetic oligonucleotides, miArrest™ miRNA inhibitors bind specifically to their target miRNA, allowing transient or stable blockage of the miRNA regulation. They are designed and optimized for miRNA loss of function study.

Vector	Promoter	Selection marker	Reporter gene	Viral type
pEZX-AM03 or AM04	H1 or U6	Hygromycin	mCherry	Lenti
pEZX-AM01 or AM02	H1 or U6	Puromycin	mCherry	N/A

miRNA inhibitor clones can be purchased as either individual clones or clone sets.

Vector-Based vs. Synthetic Oligonucleotides

Feature	Vector-based inhibitor	Synthetic 2'-OMe inhibitor
Inhibition	+++++	++
Specificity	+++++	+++
Stability	+++++	+
Durability	Long term	Transient
Cell toxicity	-	-
Delivery to resting and hard-to-transfect cells	+++++	-

Full coverage
- Human, mouse and rat

Flexible delivery
- Lentiviral or non-viral vectors

Superior performance
- Constitutive expression with H1 or U6 promoter
- Superior potency, long lasting inhibition
- Extremely low cell toxicity

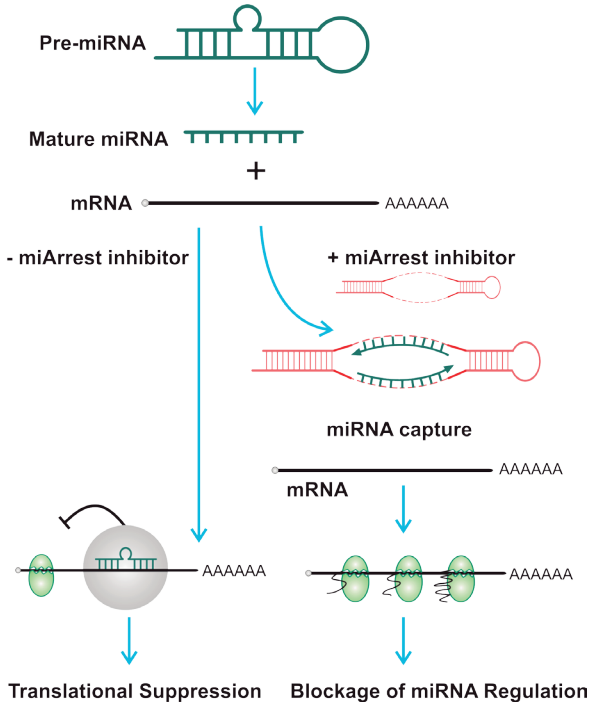


Figure 3. Mechanism of miArrest™ miRNA inhibitor expression clones.

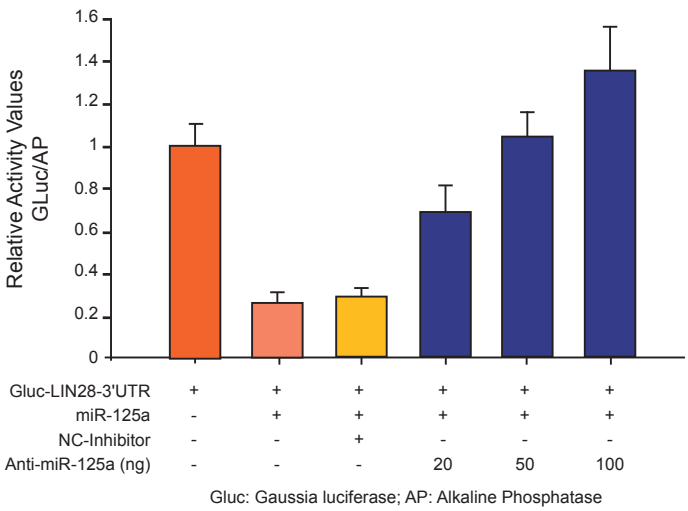
3' UTR Targets

miTarget™miRNA 3' UTR Target Sequence Expression Clones

miRNAs regulate target gene expression by binding to the specific sequences in the 3' UTR regions of target mRNAs. When the 3' UTR target sequence is fused downstream to a luciferase reporter and expressed in vitro, the luciferase expression is regulated by the miRNA that binds to the downstream 3' UTR specifically. Therefore, luciferase activity can be analyzed to study miRNA-target regulation and specificity.

Constructed in a single vector system with dual reporters, miTarget 3' UTR target expression clones enable convenient and accurate study using one reporter for regulatory detection and the other one for internal control and signal normalization.

Vector	Reporter gene	Tracking gene	Advantage
pEZX-MT05	*Gaussia* luciferase	Alkaline phosphatase	Live cell assays
pEZX-MT01	Firefly luciferase	*Renilla* luciferase	Assays on cell lysates



Gluc: Gaussia luciferase; AP: Alkaline Phosphatase

Gluc-LIN28-3'UTR:

3'UTR sequence of LIN28 in *Gaussia* Luciferase-Alkaline Phosphatase dual reporter expression vector. LIN28 is a known target gene for miR-125a .

miR-125a:

miR-125a precursor expression plasmid

NC-Inhibitor:

negative control, no inhibitor

Anti-miR-125a :

miR-125a inhibitor expression plasmid

Figure 4. Effect of vector-based inhibitor against miR-125a. A miR-125a inhibitor expression plasmid was transfected into HEK 293 cells with 1) a miR-125a precursor expression plasmid and 2) a 3'UTR sequence of LIN28 in *Gaussia* Luciferase-Alkaline Phosphatase dual reporter expression vector. Both the GLuc activity and an internal control AP activity were determined 24 hours post-transfection. For normalization purposes, the activity ratio of GLuc to AP was set to 1 for LIN28 3'-UTR target clone only transfection (first bar from the left). The result shows that mir-125a suppressed the luciferase activity from the Gluc-LIN28-3'-UTR clone by more than 70% (second bar from the left). This suppression effect was blocked by the introduction of varying amounts of miArrest™ inhibitor clone against miR-125a in a dose-dependent manner. At the highest dose, the reporter GLuc activity is higher than the control (first bar from the right). This could be attributed to the fact that the vector-based inhibitor may have blocked the regulatory effect of endogenous miR-125a, which would result in increased translational activity of GLuc-LIN28-3'-UTR transcript.

Luciferase Assays

Luciferase activities of miTarget miRNA 3' UTR Target Clones can be analyzed using the **Secrete-Pair™ Dual Luminescence Assay Kit** or **LucPair™ miR Dual Luciferase Assay Kit**. Both kits measure dual reporter signals and allow transfection normalization.

Assay kit	Description	Target clone vector type	Reporter gene	Tracking gene
Secrete-Pair Dual Luminescence Assay Kit	Live cell assay Dual reporter assay Signal normalization	pEZX-MT05	Gaussia luciferase	Secreted alkaline phosphatase
Luc-Pair miR Dual Luciferase Assay Kit	Cell lysis required Dual reporter assay Signal normalization	pEZX-MT01	Firefly luciferase	Renilla luciferase

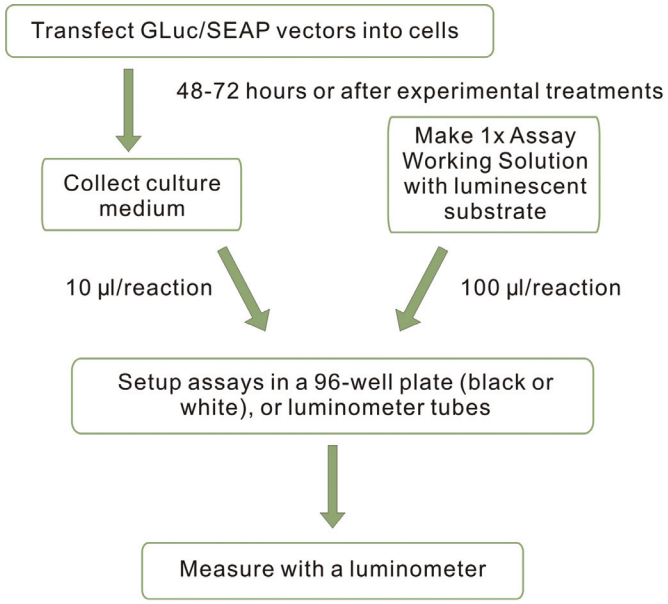


Figure 5. Simple and convenient workflow of Secrete-Pair™ Dual Luminescence Assay Kit

Dual reporter system

- Measure the activities of reporter gene and tracking gene from a single sample

Convenient live cell assay

- Live cell analysis available for pEZX-MT05 constructs with secreted reporters

Robust performance

- Reliable and linear results for a large dynamic range
- Very-limited background luminescence. No subtraction is required from reading

Complete Solutions

GeneCopoeia offers complete solutions for microRNA research. The related products were developed for use with GeneCopoeia miRNA precursor, inhibitor and target expression clones. They have been tested and validated to provide robust and reproducible performance.

Category	Product	Description
Lentiviral System	Lentifect™ Lentivirus Production Services	High-titer crude or purified lentiviral particles produced by experts and ready-for-transduction
	Lenti-Pac™ Lentiviral Packaging Kits	• Optimized lentiviral packaging plasmid mix • eGFP control clone • LentiFect™ , a new transfection reagent developed to work with lentiviral-based constructs • TiterBoost™ , a reagent that further increases the titers by 5-10 fold
	Lenti-Pac™ 293Ta Lentiviral Packaging Cell Line	For high-titer lentiviral production using Lenti-Pac™ lentiviral packaging kits
Custom Cloning	De Novo Gene Synthesis and Cloning Services	For any miRNA precursors, inhibitors, and 3'UTR target sequences that are not on our premade product list
Transfection Reagents	EndoFectin™ Lenti EndoFectin™ CHO EndoFectin™ Plus EndoFectin™ MAX	Fully optimized and validated for specific cell types
ORF cDNA Expression Clones	OmicsLink™ Expression-Ready ORF cDNA Clones	• Genome-wide coverage of human and mouse • Largest selection of vector types and fusion tags • Fully sequenced and thousands are expression-tested

Secrete-Pair™ Dual Luminescence Assay Kit

Overview

Secrete-Pair™ Dual Luminescence Assay Kit is designed to analyze the activities of *Gaussia* Luciferase (GLuc) and Secreted Alkaline Phosphatase (SEAP) of a dual-reporter system side-by-side using the same sample from the cell culture medium. Both GLuc and SEAP are secreted reporter proteins. Samples can be easily obtained from cell culture medium without lysis of the cells.

Two buffer conditions are provided in the kit for GLuc assays depending on the applications. Buffer GL-S contains a stabilizer and can be used for stabilized activity by overcoming the quick decay of the GLuc signal. When higher sensitivity is required for detecting low expression of GLuc, Buffer GL-H can be used for higher enzyme activity.

Secrete-Pair measures dual reporter signals and allows transfection normalization. The normalized GLuc activities can be compared across samples free of the impact of transfection variation.

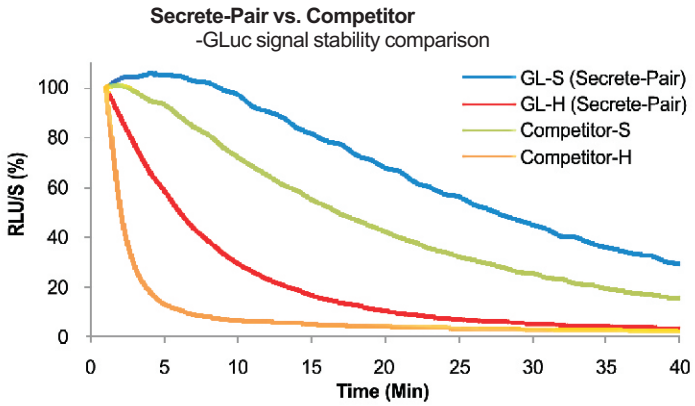


Figure 1. Comparison of GLuc signal stability in different buffer systems from Secrete-Pair and a competitor *Gaussia* luciferase assay kit.
Cell culture medium was collected from cells transfected with humanized GLuc reporter clones. 10 µl of the medium was used in each assay. Two buffer systems of each kit were tested and the assays were performed according to the manufacturer protocols. The percentage of signal retained (Y axis) is used as an indicator for signal stability. For both kits, the GLuc activities in buffers with a stabilizer (-S) are much more stable than those in buffers without a stabilizer (-H). However, when compared side-by-side, Secrete-Pair buffer systems provide more stable GLuc signal than the competitor kit.

Advantages

Live cell assays

- Secreted GLuc and SEAP
- Lysis of the cells is not necessary

Robust and flexible conditions

- Buffer for stable activity extends the half-life of light emission to approximately 30 minutes
- Buffer for higher sensitivity can be used to detect low GLuc expression

Dual-reporter detection

- Detects GLuc and SEAP
- Enables transfection-normalization for true cross-sample comparison

High-throughput compatible

- Quick and easy assay format
- High sample number compatible

GeneCopoeia™
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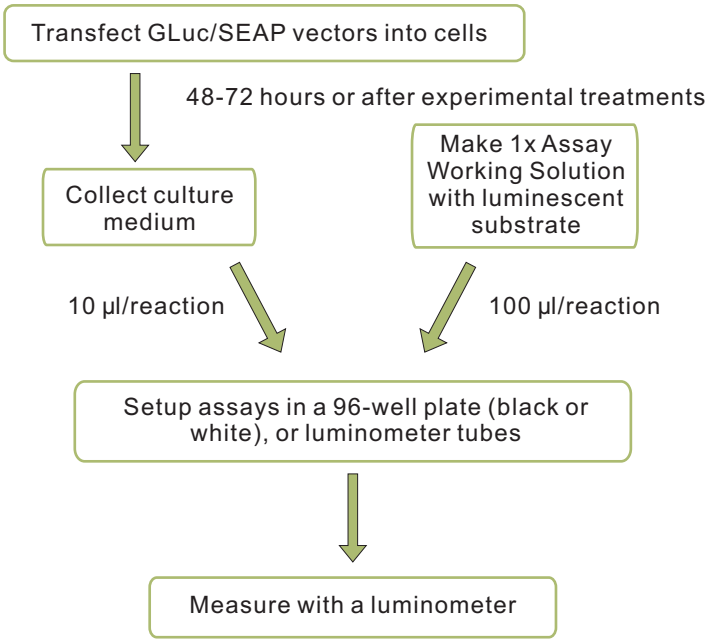
Secrete-Pair™ Dual Luminescence Assay Kit

Protocol overview



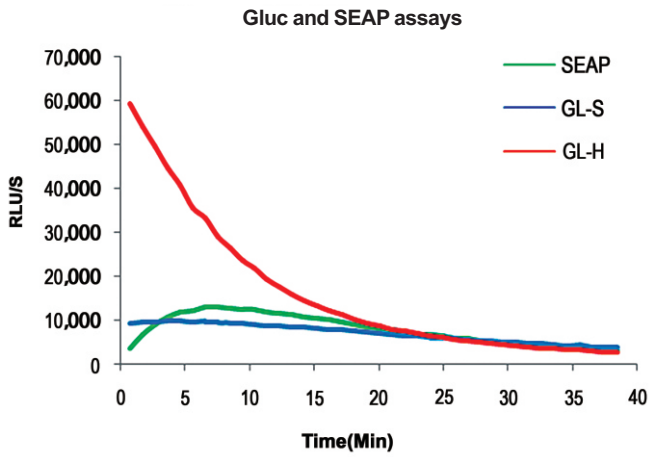


Figure 2. GLuc and SEAP assays.
Cell culture medium was collected from cells transfected with GLuc-SEAP dual-reporter clone. 10 µl of the medium was used in each assay. At the beginning, the GLuc activity in Buffer GL-H is about 3-5 times higher than that in Buffer GL-S. Then it quickly decays. The GLuc activity in Buffer GL-S, however, is much more stable. The amount of SEAP substrate was adjusted so that the reading of SEAP and that of GLuc (in buffer GL-S) are at similar levels for normalization purpose.

To order

Secrete-Pair™ Dual Luminescence Assay Kit
Cat. No. SPDA-D010 (100 reactions)
Cat. No. SPDA-D100 (1000 reactions)

Secrete-Pair™ *Gaussia* Luciferase Assay Kit
Cat. No. SPGA-G010 (100 reactions)
Cat. No. SPGA-G100 (1000 reactions)

Related Products

- GLuc-ON™ Promoter Reporter Clones
- GLuc-ON™ SEAP Expression Clone
- miTarget™ miRNA 3'UTR Target Clones

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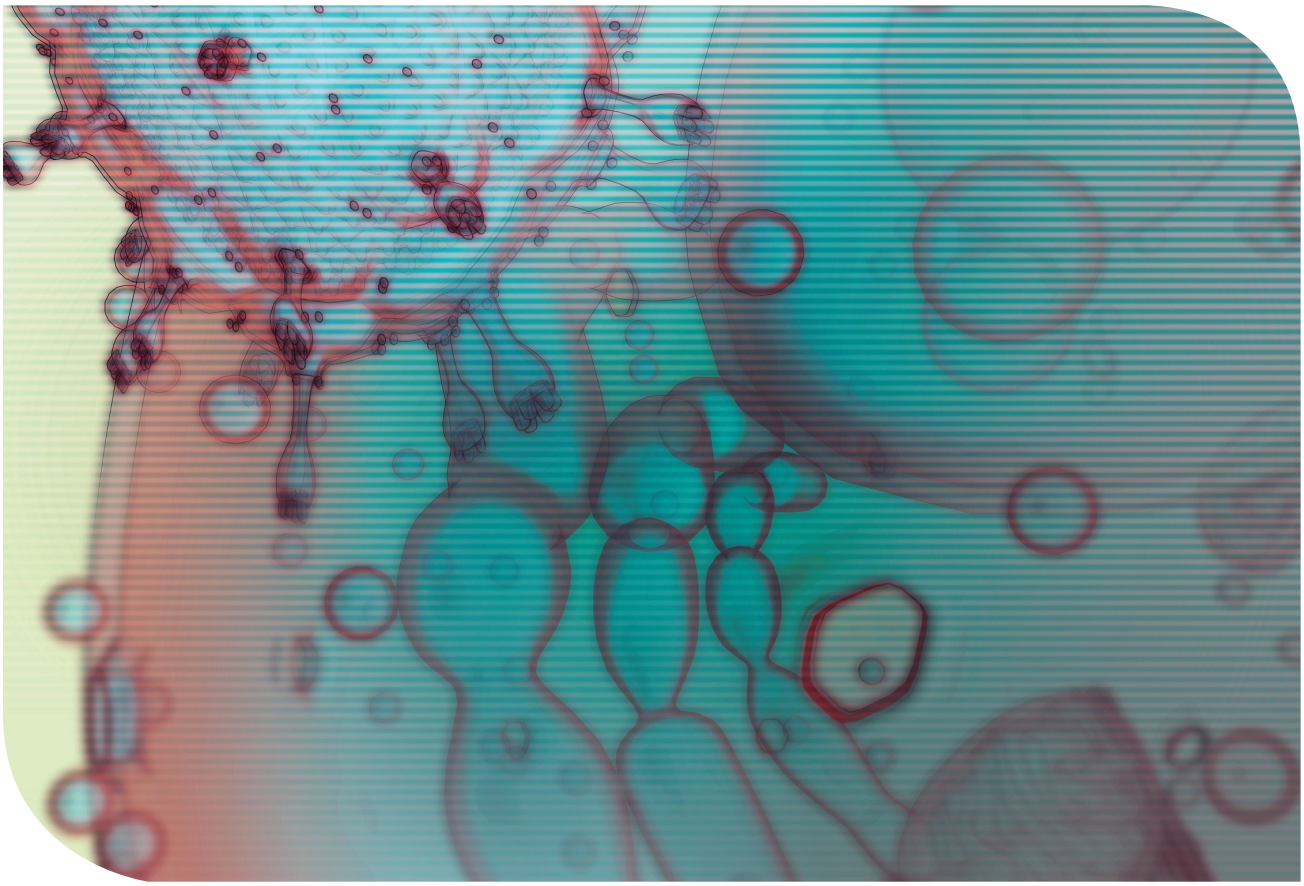
GeneCopoeia™
Expressway to Discovery

Lentiviral Solutions



Expression-Ready Clones
Lentiviral-based Expression Clones
ORF, Promoter, shRNA, miRNA, Cas9, sgRNA

Packaging Systems
Lentiviral Packaging Kits
293Ta Packaging Cell Line
Lentivirus Concentration Solution
qRT-PCR Lentivirus Titration Kits

Viral Particles
Premade Lentivirus
Budget-Friendly Collection
Custom Order

GeneCopoeia™
Expressway to Discovery

Why Lentivirus

High efficiency of delivery to broad cell types

The lentiviral expression system is very effective at delivering genetic materials to whole model organisms and a wide range of mammalian cells, including non-dividing and difficult-to-transfect cells, such as neuronal cells, primary and stem cells. The efficiency of lentiviral transduction is close to 100%, making it an ideal delivery system for genes, shRNAs, miRNAs and other genetic materials.

Long-term stable expression of a transgene

The lentiviral expression system consists of sequence elements allowing efficient packaging, transduction and stable integration into the host genome of target cells, thus, enabling long-term high level of transgene expression in target cells.

High level of safety

Lentiviral vectors used for gene transfer are replication-defective and self-inactivated in transduced cells. Multiple packaging plasmids are needed for packaging replication-defective lentiviral particles and the chance of recombination to form complete replicable competent lentivirus (RCL) is minimal.

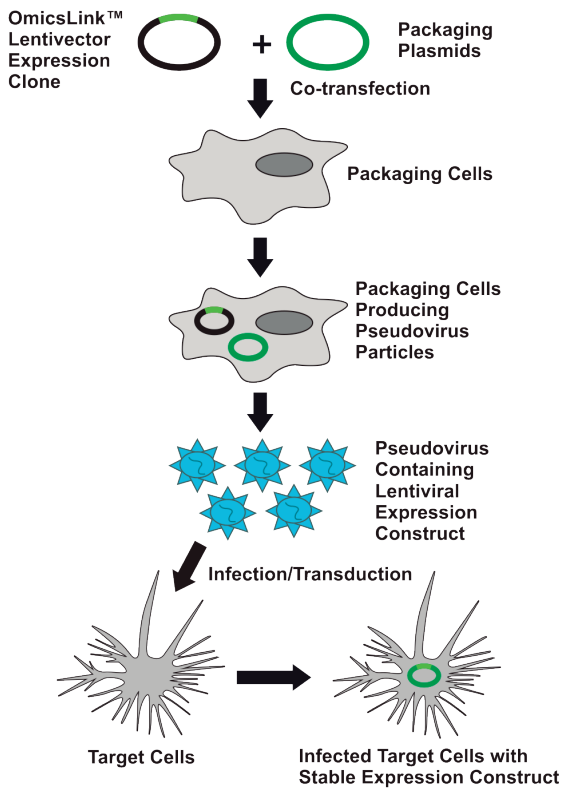


Figure 1. Illustration of how lentiviral-based gene delivery works. Note: Target cells include difficult-to-transfect and non-dividing cells.

GeneCopoeia Complete Lentiviral Solutions

Expression-ready clones

- ORF clones
- shRNA clones
- miRNA precursor clones
- miRNA inhibitor clones
- Promoter reporter clones
- CRISPR-Cas9 clones

Packaging kits and cell line

- Lentiviral packaging kits
- 293Ta packaging cell line
- Lentivirus concentration solution
- qRT-PCR lentivirus titration kits

Transduction-ready viral particles

- Premade lentivirus
- Budget-friendly collection lentivirus
- Custom lentivirus production services

GeneCopoeia provides a large collection of lentiviral constructs for expressing ORF cDNAs, shRNAs, precursor miRNAs, or miRNA inhibitors in virtually all mammalian cell types.

OmicsLink™ ORF clones

- Fully sequenced and expression -tested
- Human and mouse genome-wide coverage
- Custom order of de novo gene synthesis
- Largest selection of vectors and fusion tags

Promoter	Selection Marker	Fusion tag (N- and/or C-terminus)		
CMV CMV5 EF1a CAG PDK SV40 Inducible	Neomycin Puromycin Hygromycin Zeomycin	HA, 3xHA Flag Myc eCFP eGFP eYFP mCherry UBC9	HaloTag* AviTag AviTag + IRES-Biotin ligase IRES-FLuciferase (Firefly) IRES-GLuciferase (Gaussia) IRES-Neomycin IRES-Puromycin	IRES-eCFP IRES-eGFP IRES-eYFP IRES-mCherry HA + IRES-eGFP Myc + IRES-eGFP Flag + IRES-eGFP

*Tev Protease site

OmicsLink™ shRNA clones

- Genome-wide coverage of human, mouse and rat
- Four shRNA constructs per target gene and guaranteed knockdown for at least one construct
- H1 or U6 promoter

Promoter	Selection marker	Reporter gene
H1, U6, Inducible	Puromycin, Hygromycin, Neomycin	eGFP, mCherry

miExpress™ precursor miRNA clones

- Fully sequenced and optimized for high expression and maturation of miRNA inside cells
- Full coverage of human, mouse and rat miRNA in miRBase database

Promoter	Selection marker	Reporter gene
H1, CMV, EF1α	Puromycin, Hygromycin, Neomycin	eGFP, mCherry

miArrest™ miRNA inhibitor clones

- Superior potency, long-lasting inhibition and extremely low cell toxicity
- Full coverage of human, mouse and rat miRNA in miRBase database

Promoter	Selection marker	Reporter gene
H1, U6, CMV	Puromycin, Hygromycin, Neomycin	eGFP, mCherry

GLuc-ON™ promoter reporter clones

- Live cell and real time analysis in dual or single reporter system
- Large collections of human and mouse promoters

Promoter	Selection marker	Reporter gene
Various	Puromycin	GLuc, eGFP, mCherry

Genome-CRISP™ CRISPR-Cas9 clones

- Genome-wide coverage of human, mouse and other species
- Choices of 1-3 constructs per target

Promoter	Selection marker	Reporter gene
U6	Puromycin	mCherry

Packaging Systems

The GeneCopoeia Lenti-Pac™ Packaging Systems provide high titer (up to 10^9 TU/ml), efficient transduction and superior level of protein expression. Developed using GeneCopoeia lentiviral expression-ready clones, Lenti-Pac™ Packaging Kits include an optimized lentiviral packaging plasmid mix, eGFP control clone, EndoFectin™ Lenti, a transfection reagent developed to work with lentiviral-based constructs, and TiterBoost™, a proprietary reagent that further increases titer by 5-10 folds.

Product	Description
Lenti-Pac™ Packaging Kit	Lentiviral packaging mix eGFP control clone EndoFectin™ Lenti transfection reagent TiterBoost™ viral titer reagent
Lenti-Pac™ 293Ta Lentiviral Packaging Cell Line	Low passage and authenticated 1.5 x 10^6 cells
GeneCopoeia™ GCI-L3 Chemically Competent E. coli Cells	High transformation efficiency with extremely low rates of recombination
Lenti-Pac™ Lentivirus Concentration Solution	Quick and simple concentration of lentiviral particles
Lenti-Pac™ qRT-PCR Lentivirus Titration Kits	Determine the copy numbers of HIV or FIV lentiviral particles

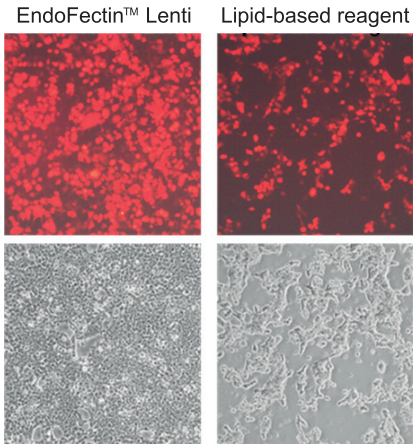


Figure 2. Comparison of Transfection Reagents HEK293T packaging cells were transfected with GeneCopoeia Lentiviral vector expressing mCherry fluorescent protein and Lenti-Pac HIV packaging mix using either EndoFectin Lenti (left panel), or a leading lipid-based transfection reagent (right panel). Expression of mCherry and cell health were checked 48 hours post-transfection using fluorescence microscopy (upper panel) or phase contrast microscopy (lower panel). The titer of lentivirus generated with EndoFectin Lenti reagent was over 20-fold higher than with the lipid-based transfection reagent.

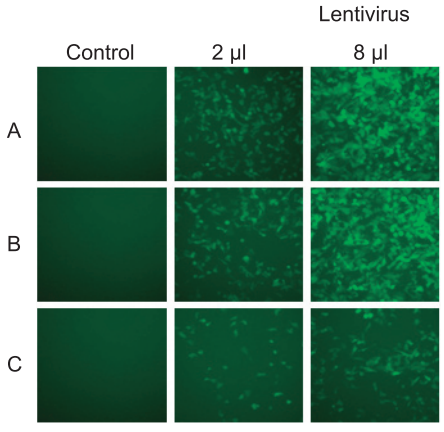


Figure 3. Comparison of Packaging Mixes H1299 cells were transduced with eGFP expressing lentiviral particles generated with three different packaging mixes:
A: GeneCopoeia's Lenti-Pac packaging mix
B: LX packaging mix
C: UM packaging mix

Lentiviral Particles

Lentiviral vectors are potent vehicles for delivering genes into a wide range of cell types including difficult-to-transfect and non-dividing cells. However, producing, concentrating and titrating lentiviral particles are time consuming and require experience to achieve high titers and consistent results.

GeneCopoeia's experienced scientific expertise consistently produces high quality and high-titer crude or purified viral particles to meet your research need in an efficient and cost-effective way.

Product	Gene	Description
Premade iPSC gene particles	• Induced pluripotent stem cell (iPSC) genes -Oct3/4, Sox2, c-Myc, Klf4, Nanog and Lin28	Transduction-ready 10^7-10^9 TU/ml (purified) Available in 25 µl and 100 µl sizes
Premade control particles	• Positive controls-eGFP, mCherry, Firefly luciferase, Renilla luciferase • Negative control -no insert	Transduction-ready 10^8 TU/ml (purified) Available in 25 µl and 100 µl sizes
Custom lentiviral production services (including budget-friendly collection)	• Any GeneCopoeia expression-ready clones of ORF, shRNAs, precursor miRNAs, miRNA inhibitors, and sgRNAs • De novo gene synthesis and cloning services for genes not listed on GeneCopoeia website	Choices of lentiviral vectors with or without tags Custom-made vectors also available 10^7-10^9 TU/ml (purified) Available in 50 µl, 100 µl and 200 µl sizes

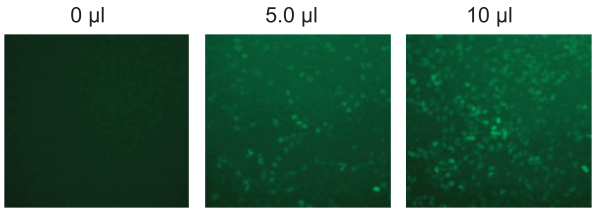


Figure 4. Transduction of H1299 cells with GeneCopoeia lentiviral particle expressing a large gene.
H1299 cells (in 24-well plate) were transduced with indicated amounts of LP-Y3533-Lv122 in the presence of 5 µg/ml of polybrene. The expression of C-terminal eGFP SMARCA4 fusion protein was checked with a fluorescence microscope 72 hours post-transduction.

ID of Y3533: SMARCA4
Length of SMARCA4 coding region: 4944 bp
Length of SMARCA4 eGFP fusion: > 5.6Kp

Count on us

- High titer purified lentiviral particles
- Stringent quality control and qRT-PCR validation
- Fast delivery
- Cost effective

GeneCopoeia™
Expressway to Discovery

Infect All Cells

LentiFect™ Lentiviral Particles

Pre-made particles and custom services available

Main Features

- Titer above 10^8 TU/mL for premade particles
- All lentiviral products purified and ready to transduce
- High transduction efficiency and long-term expression
- Third generation packaging system ensures safety
- Largest collection of ORF, miRNA, shRNA, promoter and sgRNA lentiviral clones to choose from
- Cost-effective, high quality and fast delivery
- All lentiviral clones are sequence verified

Completely customizable with modular components.

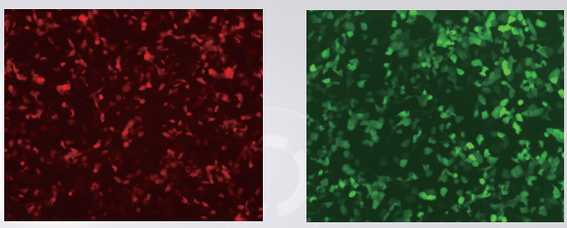
Type of clones	ORF	Precursor miRNA	miRNA inhibitor	shRNA	Promoter	sgRNA
Promoter	CMV, CMV5, EF1α, CAG, PDK, SV40, Inducible	H1, CMV, EF1α	H1, U6, CMV	H1, U6, Inducible	Various	U6
Reporter gene	eGFP, mCherry, Gluc, eCFP, eYFP	eGFP, mCherry			eGFP, mCherry, Gluc	mCherry
Selection marker	Puromycin, Neomycin, Hygromycin, Zeomycin	Puromycin, Neomycin, Hygromycin			Puromycin	

LentiFect™ Lentiviral Particles

Quick delivery and low price

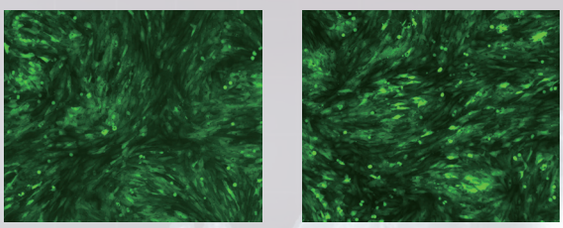
Custom lentiviral particles	Titer of 10^7-10^9 TU/mL, purified and concentrated
Any ORF, shRNA, sgRNA, precursor miRNA or miRNA inhibitors	Third generation packaging system Titer determined by qPCR
Premade particles	**Titer over 10^8 TU/mL, purified and concentrated**
Positive and negative controls	Fluorescent tags: eGFP, eYFP, eCFP, mCherry, PLUM Luciferase reporters: Firefly, Renilla, Gaussia
iPSC ORF clones	OSKM transcription factors: Oct4, Sox2, Klf4, c-Myc, Nanog and Lin28
Utility ORF clones	CRE recombinase, FLP recombinase, SV40 large T antigen, HIV tat, Cas9 nuclease

Premade particles: Next-day shipment and clone price included!



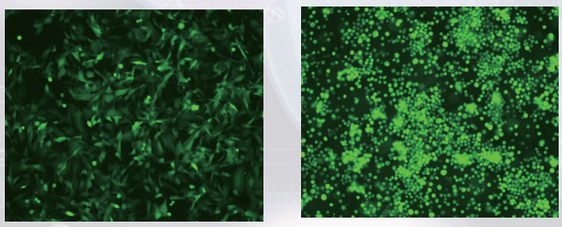
mCherry eGFP

Figure 1. H1299 cells were transduced in a 24-well plate with mCherry (left panel: LPP-MCHR-Lv105) or eGFP (right panel: LPP-EGFP-Lv105). Exposure time was ≤1 s with an MOI=1.



MOI=10 MOI=30

Figure 2. NIH/3T3 cells were transduced in a 24-well plate at two different multiplicities of infection (MOI) using LPP-NEG-Lv201 particles.



HOS K562

Figure 3. Two cancer cell lines (Left: HOS, Right: K562) were transduced and puromycin selection was applied after 48 h. Inquire today for custom stable cell lines.

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GeneCopoeia™ Expressway to Discovery

Genome Editing Solutions

Precision genome modification

Genome-TALER™ custom TALEN and TAL effector services
Genome-CRISP™ CRISPR-Cas9 products and services

Validation and more

Functional validation
Donor clone design and construction
Stable cell line development
Transgenic mouse development

Safe harbor genome integration

Human AAVS1 safe harbor gene knock-in kit
Human AAVS1 safe harbor knock-in ORF clones

GeneCopoeia™
Expressway to Discovery

Targeted genome editing at will

One of the most common approaches for analyzing gene function is to alter the sequence of a gene and monitor its effects on the organism. Genome editing is one such type of modification, in which DNA is inserted, replaced or removed from a genome by engineered nucleases. These nucleases induce double-strand breaks (DSBs) at defined sites, leading to modifications resulting from the cellular repair mechanisms of non-homologous end joining (NHEJ) and homologous recombination (HR; Figure 3). Alternatively, this technology can be adapted to target engineered transcription factors to specific sites in order to transiently stimulate or repress gene expression (Figure 2).

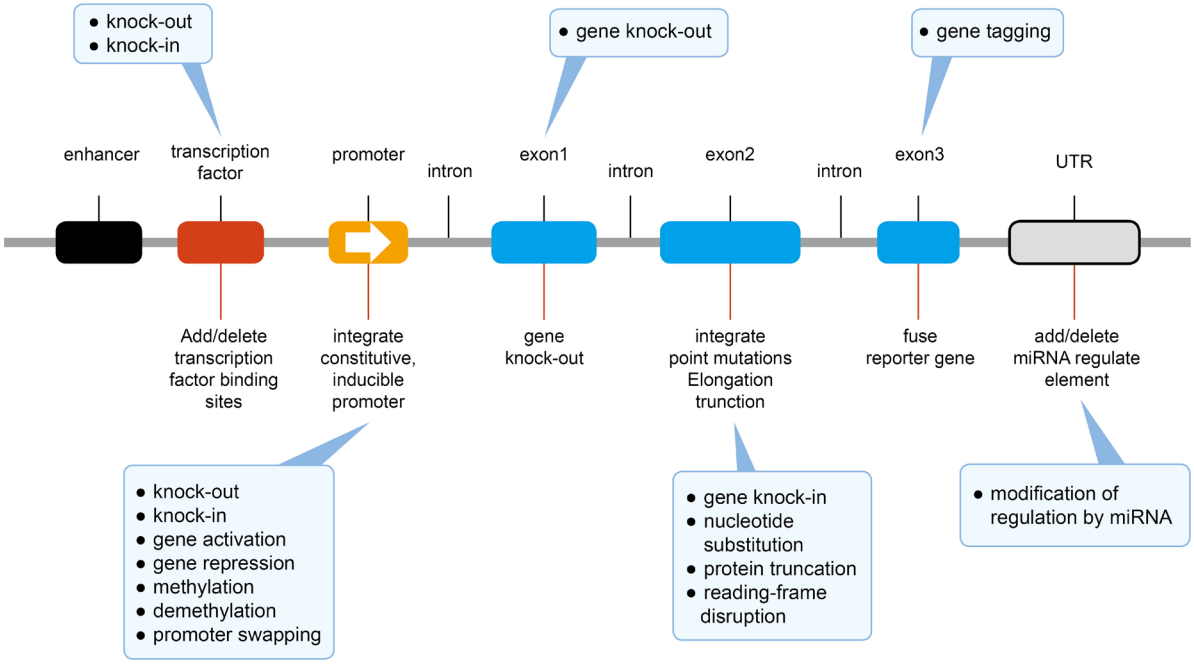


Figure 1. Applications for targeted genome editing

Mechanisms of genome editing

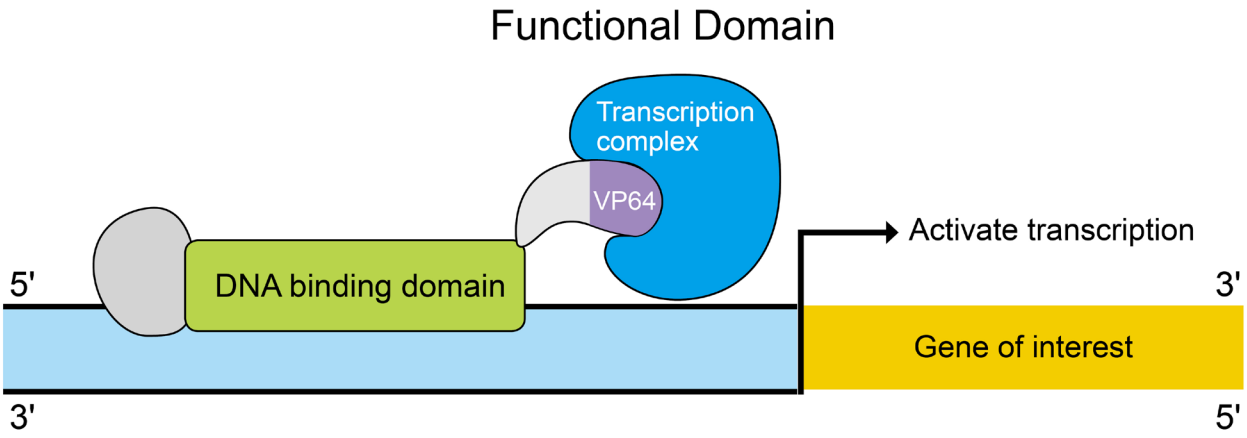


Figure 2. Gene transcription manipulation with engineered transcription factors.

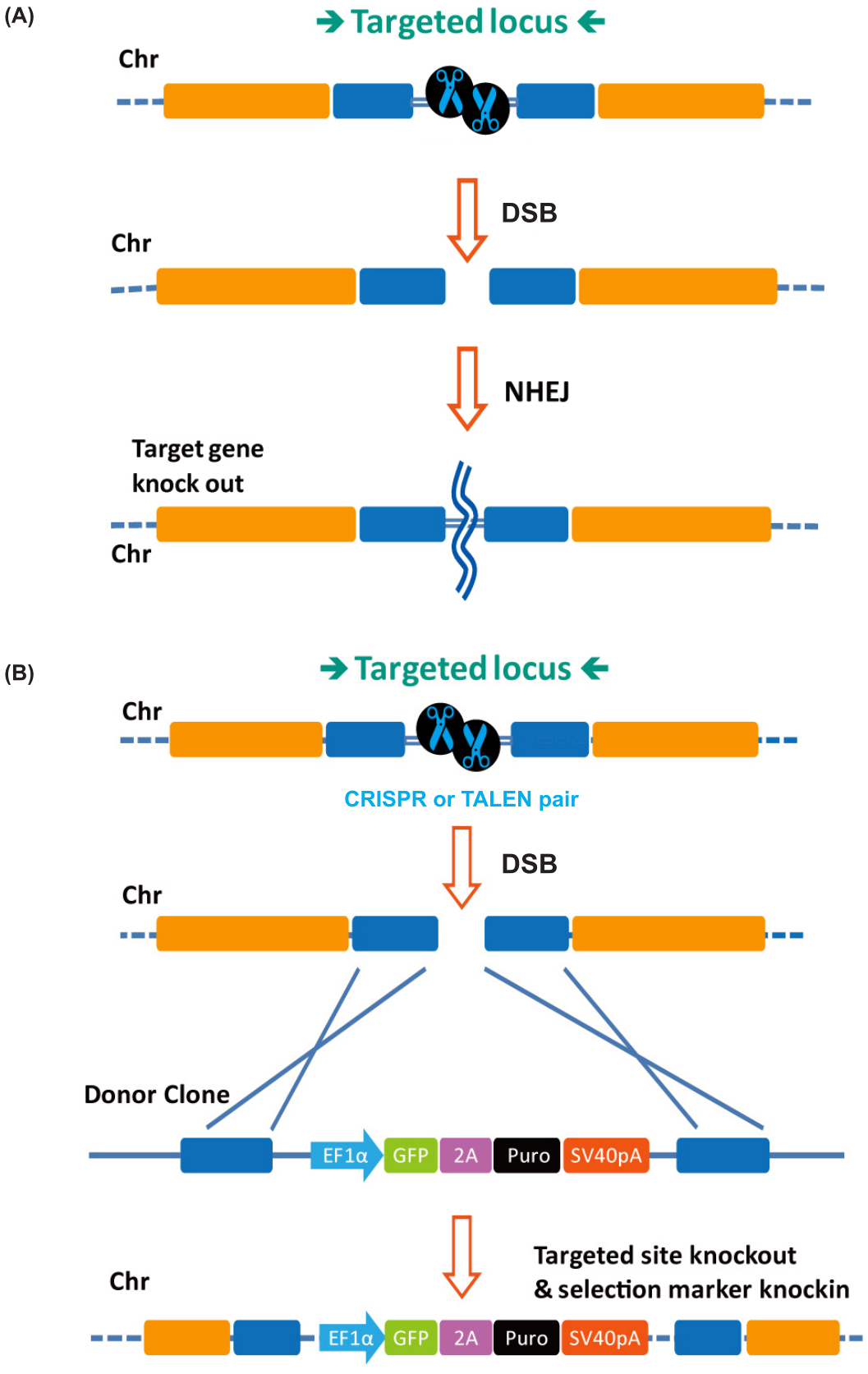


Figure 3. Genome editing with engineered nucleases. (A) DSB created by engineered nucleases are repaired by NHEJ. **(B)** DSB created by engineered nucleases are repaired by the insertion of genes of interest (GOI) & selection markers (or other genetic elements) from a donor plasmid through HR.

Product Portfolio

Genome-TALER™ TAL effectors

Product/Services	Description
TALEN	Sequence-confirmed plasmid pair expressing engineered TALE nuclease specifically targeting your genome site of interest.
TALE-TF	Sequence-confirmed plasmid expressing engineered TALE transcription activator targeting your promoter region of interest.
Validation services	Functional validation of your TAL effector.
Donor clones	Knockin desired sequences to your genomic site of interest via TALEN-mediated homologous recombination. Various vector choices with different reporter genes and selection markers.
Stable cell line services	Monoclonal stable cell lines with TALEN-mediated genome modifications. Cell banking service available.
Transgenic mouse services	Transgenic mice with TALEN-mediated genome modifications.

Genome-CRISP™ CRISPR-Cas9 system

Product /Services	Description
Cas9 nuclease expression clone	Express Cas9 nuclease to create double-strand break at your genomic site of interest in combination with sgRNA(s).
Cas9 nickase expression clone	Express engineered Cas9 nickase to create single-strand nick at your genomic site of interest in combination with sgRNA(s).
sgRNA clones	Transcribe sgRNA(s) to guide Cas9 nuclease to target sites. Various vector choices for transcribing sgRNA alone or with the Cas9 nuclease expression cassette built in.
Validation services	Functional validation of your CRISPR sgRNA(s).
Donor clones	Knockin desired sequences to your genomic site of interest via CRISPR-Cas9-mediated homologous recombination. Various vector choices with different reporter genes and selection markers.
Stable cell line services	Monoclonal stable cell lines with CRISPR-Cas9-mediated genome modifications. Cell banking service available.
Transgenic mouse services	Transgenic mice with CRISPR-Cas9-mediated genome modifications.

Genome-TALER™ human AAVS1 safe harbor

Catalog#	Product	Description
SH-AVS-K100	Human AAVS1 safe harbor gene targeting kit	Includes: AAVS1 TALEN pair (TN-AAVS1) AAVS1 donor cloning vector (DC-DON-SH01) AAVS1 positive control donor (DC-RFP-SH01) knock-in verification primer pairs (HQPAVSHR)
SH-AVS-K000	Human AAVS1 safe harbor gene targeting kit (without donor)	Includes: AAVS1 TALEN pair (TN-AAVS1) AAVS1 positive control (DC-RFP-SH01) knock-in verification primer pairs (HQPAVSHR)
Knock-in ORF Clones	Human AAVS1 knock-in ORF clone	AAVS1 knock-in ORF donor clone containing CMV-driven ORF of customer's gene of interest

Choice of service levels

Services	Engineer	Value	Essential	Premium	Project***
	2 weeks	3-5 weeks	3-5 weeks	7-8 weeks	Various
Genome editing tool design	√	√	√	√	
Clone engineering & sequencing	√	√	√	√	
Plasmid-level functional validation*		√		√	
Chromosomal-level functional validation**			√	√	
Additional or customized services					√

* Nuclease tools: surrogate reporter assay

Transcription activator: surrogate reporter transactivation assay

** Nuclease tools: mismatch detection analysis

Transcription activators: transactivation assay

***Includes donor service, stable cell line service, and transgenic mouse service

Advantages

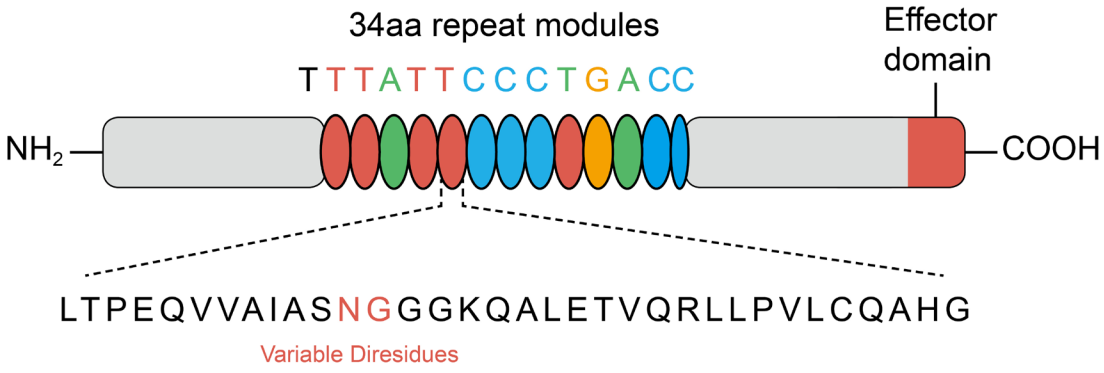
- **Complete solutions.** Genome editing tool design and construction, functional validation services, donor design and construction services, cell or animal model development services for a complete TALE or CRISPR project.
- **Sequence guarantee.** All constructs are sequence verified and guaranteed.
- **Fast delivery.** Fast delivery for both CRISPR and TAL effector constructs. We have pre-built and sequence-verified TAL effector modules for quick assembly.

Comparison between TALEN, CRISPR-Cas9 and ZFN

Property	TALEN	CRISPR-Cas9	ZFN
Type of recognition	Protein-DNA	RNA-DNA	Protein-DNA
Recognition mode	Uses a simple, virtually one-to-one code	Uses Watson-Crick base pairing	Recognizes DNA triplets with context dependence
Methylation sensitivity	Sensitive	Not sensitive	Sensitive
Chromatin structure sensitivity	Sensitive	Sensitive	Sensitive
Off-target activity	Less observed off-target activity than ZFN	More potential off-target activity than TALENs and ZFNs	More potential off-target activity than TALENs
Multiplexing	Rarely used	Capable	Rarely used

TALEN custom services

Transcription activator-like (TAL) effectors are proteins secreted by Xanthomonas bacteria when they infect plants. These proteins can activate the expression of plant genes by recognizing and binding host plant promoter sequences through a central repeat domain consisting of a variable number of ~34 amino acid repeats. The residues at the 12th and 13th positions of each repeat are hyper-variable. There appears to be a simple one-to-one code between these two critical amino acids in each repeat and each DNA base in the target sequence, e.g. NI = A, HD = C, NG = T, and NN = G or A (Figure 4). Recent work has demonstrated that the NH RVD has greater specificity and comparable affinity for G compared with NN. Therefore, the NN RVD has been replaced for G recognition by NH. GeneCopoeia also uses the N* RVD for recognition of 5-methyl cytosine.



NG	HD	NI	NN	NH	N*
T	C	A	G/A	G	5mC

Figure 4. Top: Schematic of a TAL effector. Bottom: Typically-used RVD recognition code

A TAL effector nuclease (TALEN) contains a TALE DNA binding domain fused to the FokI nuclease. Two TALENs must bind on each side of the targeted site for FokI to dimerize and generate a DSB (Figure 5). The cellular repair mechanism of non-homologous end joining (NHEJ) can then reconnect the DNA and induce insertion or deletion errors at the site of the break. Alternatively, an exogenous double-stranded donor DNA fragment can be used to repair the DSB by homologous recombination (HR). TALENs have been used to generate stably modified human embryonic stem cell and induced pluripotent stem cell (IPSCs) clones, and to generate knockout organisms such as rats, C. elegans, and zebrafish.

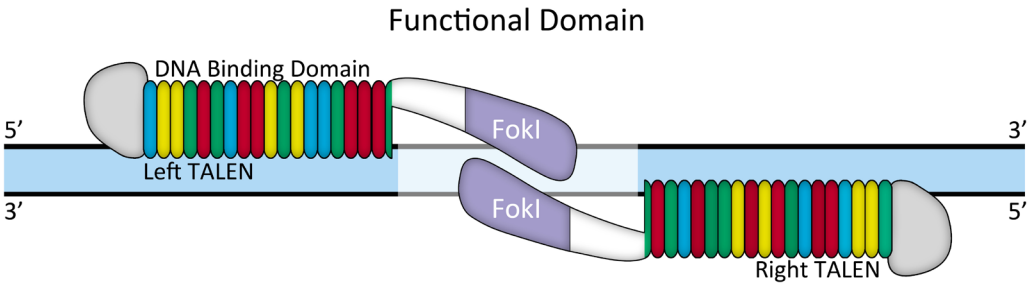


Figure 5. Typical TALEN design strategy

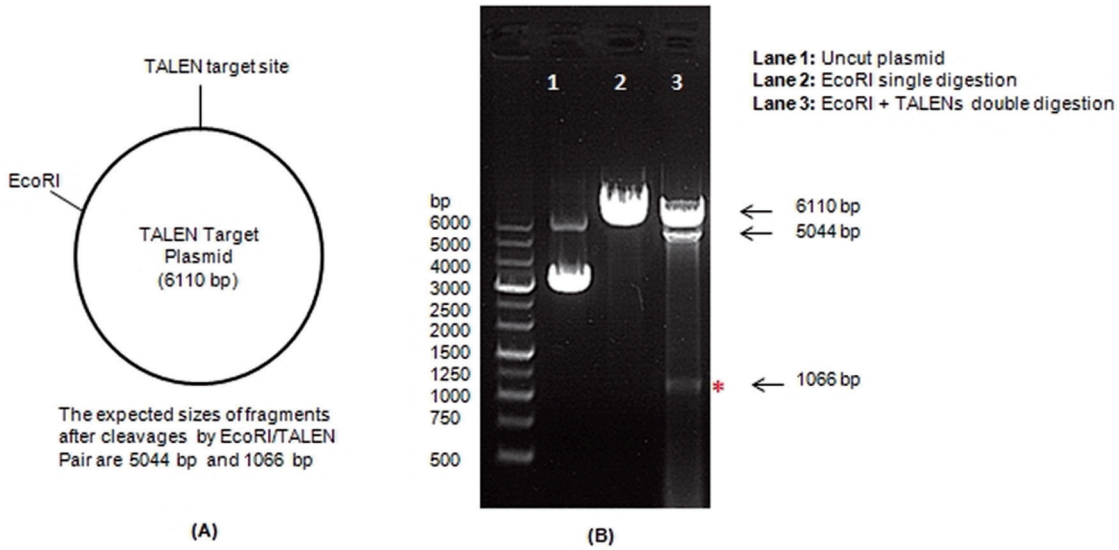


Figure 6. In vitro target DNA cleavage by EGFP-TALENs. (A) The TALEN target plasmid (6110 bp) contains a unique EcoRI site and an eGFP TALEN target site. The two sites are1066 bp apart. (B) 1 µg of the plasmid was incubated with the indicated enzymes for 30 min at 37°C. 0.5 volume of the digestion reaction was analyzed by agarose gel electrophoresis. * The indicated fragment was analyzed by PCR (data not shown)

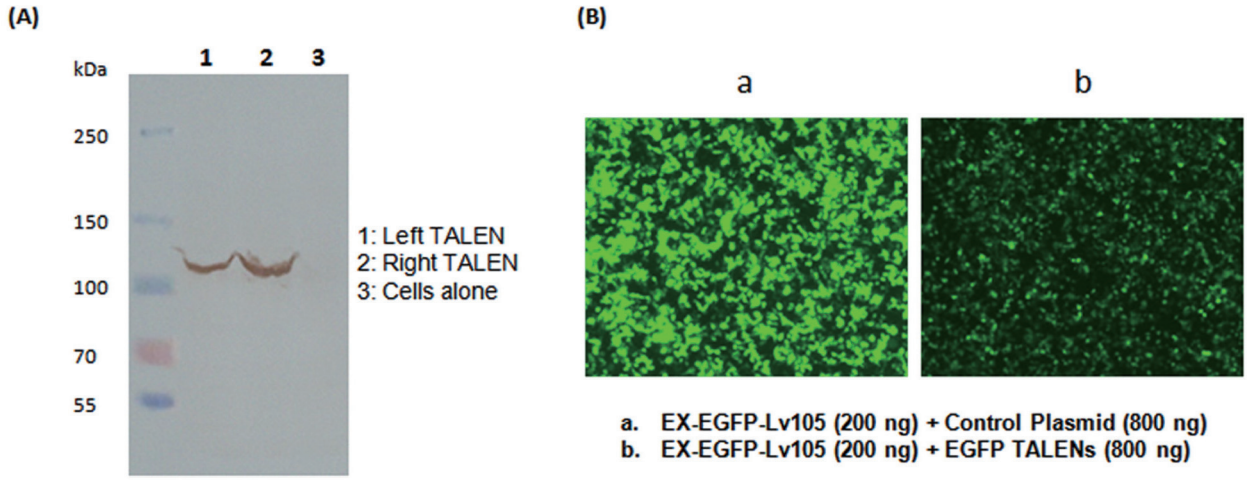


Figure 7. TALEN-mediated knockdown of eGFP expression. (A) eGFP TALENs expression validation: ~80% confluence HEK293T cells were transfected with 0.8 µg plasmid per well in a 6-well plate. The cells were harvested 48 hrs post-transfection. 1/20th of the cell lysate per well was analyzed by western blot using anti-Flag antibody in an SDS-PAGE (8%) gel, with the untransfected cell lysate as the negative control. (B) TALENs knockdown eGFP expression: HEK293T cells in a 6-well plate were co-transfected with EX-EGFP-Lv105 and TALEN plasmids or control plasmid. EGFP expression was checked under microscope (Nikon Eclipse Ti, exposure time: 600ms) 48hrs post-transfection.

TALE-TF custom services

A key application for TALEs is the targeted activation and repression of target genes in cells by fusing transactivation domains to TALE DNA binding domains (Figure 8). The TALE-TF construct is a powerful tool to selectively modulate gene expression in eukaryotic cells with exquisite specificity. The TALE-TF contains a TALE DNA binding domain fused to the VP64 transcription activator.

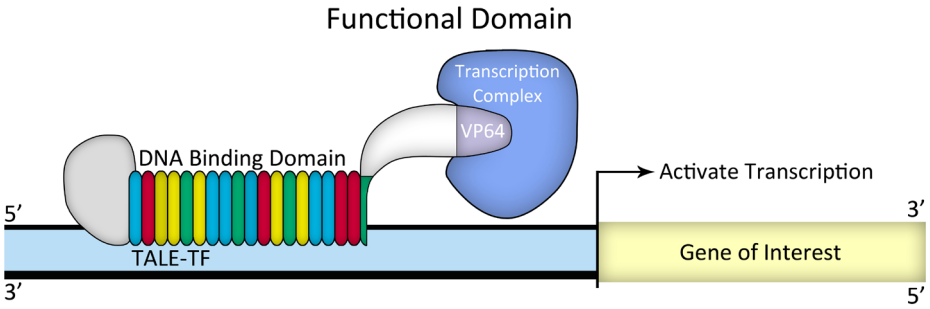


Figure 8. Typical TALE-TF design strategy

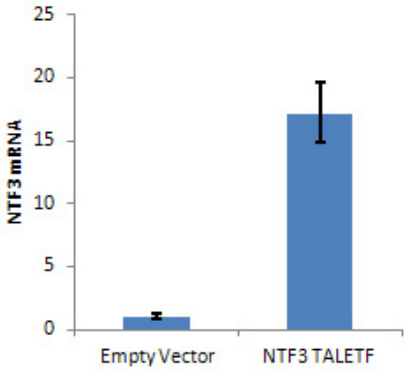


Figure 9. Endogenous NTF3 transcription activation by TALE-TF: HEK 293T cells transfected with the NTF3 TALE-TF (6 well plate, 1 µg plasmid per well) exhibited a 17-fold increase in the amount of NTF3 mRNA compared to cells transfected with an empty vector. Measurements were performed in triplicate.

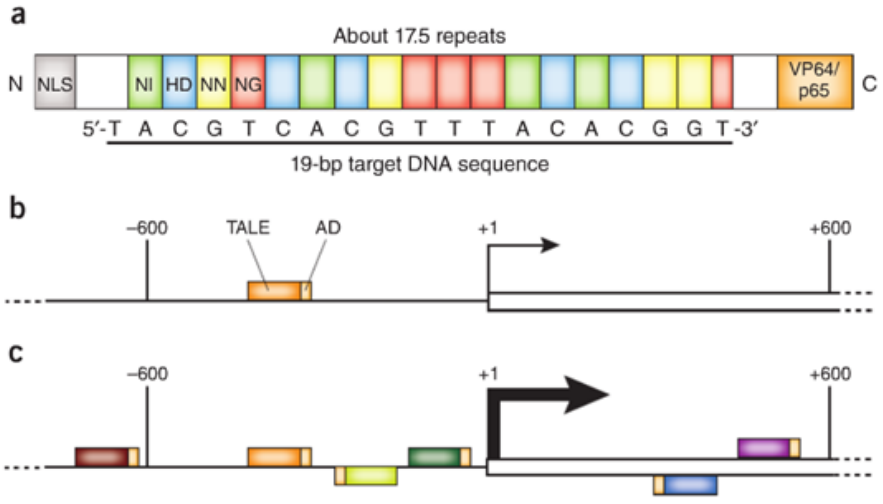


Figure 10. Synthetic TALE activators act synergistically to express human genes. (a) Cartoon of a TALE. The indicated amino acids in each repeat recognize the base below. NLS, nuclear localization signal; VP64/p65, activation domains (ADs). (b) Single TALEs induce target human genes with variable efficiencies. (c) Combinations of TALEs targeting either DNA strand allow for much higher gene induction rates. (Nature Methods. 2013 Vol. 10. No. 3: 207-208)

CRISPR-Cas9: RNA-guided genome editing

The clustered, regularly interspaced, short palindromic repeats (CRISPR)-associated protein (Cas) systems are adaptive mechanisms evolved by bacteria and archaea to repel invading viruses and plasmids. Recently, efficient genome editing by the CRISPR-Cas system has been shown in multiple organisms, including zebrafish, mice, rats, C. elegans, plants, and bacteria. Several groups have demonstrated that compared with zinc finger nucleases (ZFNs) and transcription activator-like effector nucleases (TALENs), CRISPR-Cas–mediated gene targeting has similar or greater efficiency in cells and zebrafish.

In the CRISPR-Cas9 systems, the complex of a CRISPR RNA (crRNA) annealed to a trans-activating crRNA (tracrRNA) is sufficient to guide the Cas9 endonuclease to a specific genomic sequence to generate DSBs in target DNA. This system can be simplified by fusing crRNA and tracrRNA sequences to produce a synthetic chimeric single-guided RNA (sgRNA). The selected target sequence consists of a 20bp DNA sequence complementary to the crRNA or the chimeric sgRNA, followed by the trinucleotide (5'-NGG-3') protospacer adjacent motif (PAM), which is recognized by Cas9 itself and is essential for cleavage (Figure 10).

This RNA-guided DNA recognition mechanism of CRISPR-Cas9 provides a simple but powerful tool for selected genome engineering. One of the most important advantages of CRISPR-Cas systems is that the Cas9 protein can be guided by individual sgRNAs to modify multiple genomic target loci simultaneously.

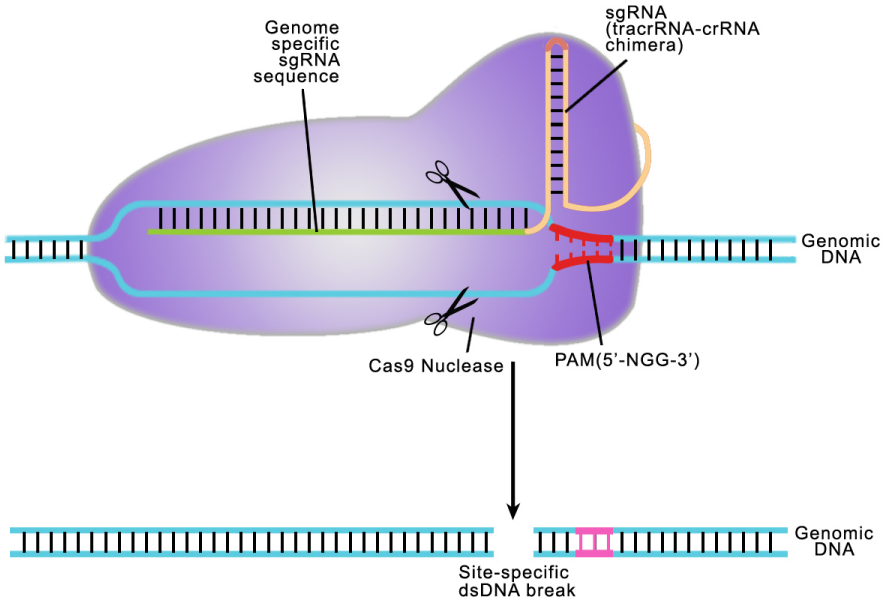


Figure 10. Illustration of CRISPR/Cas9-mediated genome editing

Cas9 expression clones

Genome-CRISP™ Cas9 Nuclease Expression Clone

A Cas9 nuclease expression clone is a premade clone containing the sequence of engineered Cas9 nuclease. In the presence of crRNA and tracrRNA (or chimeric sgRNA), Cas9 nuclease can be guided to induce site-specific DSBs in the host genome, which stimulates the cellular repair mechanism for further modification. (Figure 11)

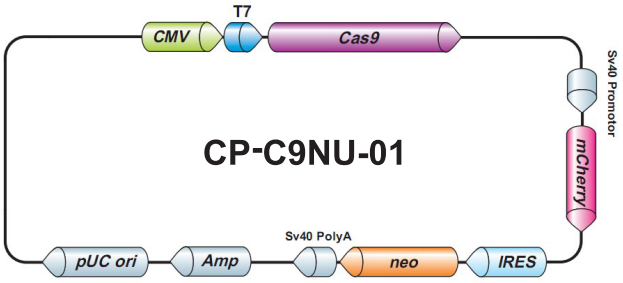


Figure 11. Map of Cas9 Nuclease Expression Clone

Genome-CRISP™ Cas9 Nickase Expression Clone

A Cas9 nickase expression clone is a premade clone containing the sequence of engineered Cas9 nickase (Figure12), which contains an amino acid mutation at position D10A. This mutation inactivates the nuclease catalytic activity to the complementary strand, converting a Cas9 nuclease to a "nickase" enzyme which generates a single-stranded break at the target site on the binding strand. (Figure 13)

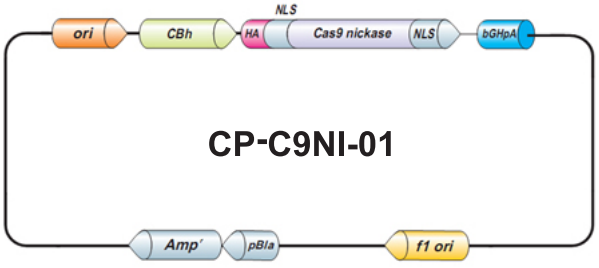


Figure 12: Map of Cas9 Nickase Expression Clone (CP-CPNI-01)

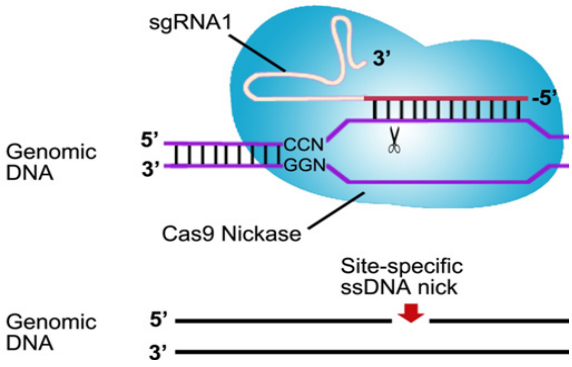


Figure 13: Illustration of Cas9 nickase generating a single-stranded break on its binding strand

Genome-CRISP™ sgRNA clones

GeneCopoeia offers single-guide RNA (sgRNA) design and cloning services for the customer's target gene of interest. sgRNA clones express a single-stranded chimeric sgRNA, consisting of crRNA and tracrRNA. In the presence of the co-transfected Cas9 endonuclease, an sgRNA can guide the Cas9 nuclease to a target site to create a DSB for genome editing applications, including gene knockout, knockin, mutagenesis, and more. Multiple sgRNA clones can be constructed and co-transfected with one Cas9 clone to enable simultaneous editing of several sites within the genome, offering greater efficiency and flexibility for the experiment design.

Vector Types

Vector	Promoter	sgRNA	Cas9 Nuclease	Selection Marker/ Reporter Gene
pCRISPR-SG01	U6	1 or multiple	Sold separately	Hygromycin
pCRISPR-CG01	U6	1 or multiple	CMV-driven Cas9 in the same vector	Neomycin / mCherry
pCRISPR-CG02	U6	1	CBh-driven Cas9 in the same vector	N/A

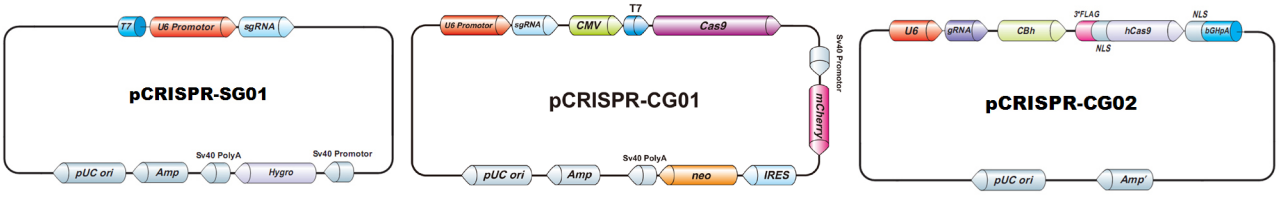


Figure 14. Maps of sgRNA vectors

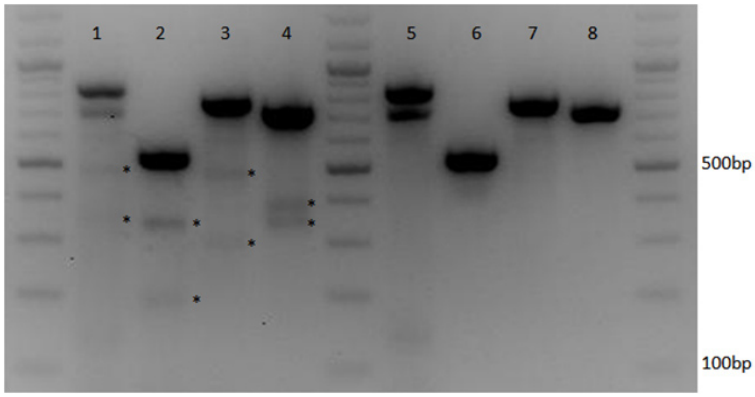


Figure 15. CRISPR-Cas9 multiplexing to target multiple genes. HEK293T GFP-stable cells were co-transfected with plasmids expressing Cas9 plus multiple sgRNAs targeting p53, HUWE1, NCL3 and GFP (Lanes 1-4) or Cas9 plus a scrambled sgRNA (Lanes 5-8). The genomic DNAs were analyzed for co-existence of indels in multiple target sites using T7 endonuclease I (ENI) assays. The * indicates that the Cas9 plus multiple sgRNAs efficiently introduced indels to each target site respectively (Lanes 1-4). PCR product sizes and T7ENI-cleaved product sizes: GFP: 720bp (intact), 340bp + 380bp (cleaved); NCL3: 765bp (intact), 295bp +470bp (cleaved); HUWE: 520bp (intact), 190bp + 330bp (cleaved); P53: 825bp (intact), 475bp + 350bp (cleaved).

Services portfolio

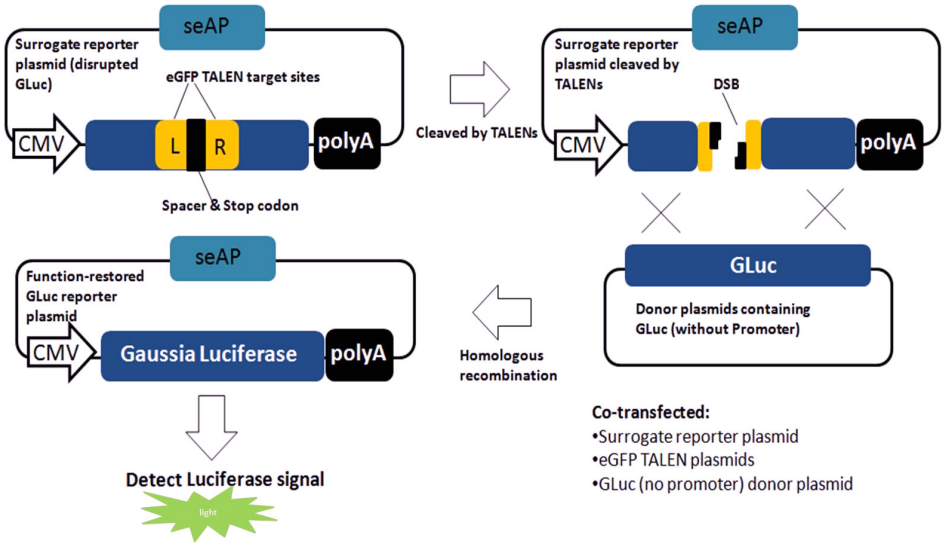
Services		Description	Application
Validation	Surrogate reporter assay	Plasmid-level functional validation. Detects activities of genome editing tools by observing the expression level of a surrogate reporter gene.	TALEN, TALE-TF, CRISPR-Cas9
	T7 endonuclease I assay	Chromosomal-level functional validation. Detects the presence of indels created by TALEN- or CRISPR-mediated NHEJ repair at the specific target site of the chromosome.	TALEN, CRISPR-Cas9
	qPCR assay	Chromosomal-level functional validation. Measures changes in expression level of the target gene induced by site-specific TALE-TF transcription activator.	TALE-TF
Donor clone services	Donor clone design and construction	Customized plasmids designed to specifically transfer your gene of interest, selection marker or other genetic elements into targeted site through homologous recombination (HR) induced by our genome editing tools. We offer various donor vector choices with different selection markers and genetic elements built in for your experiment purpose.	TALEN, CRISPR-Cas9
Stable cell line services	Monoclonal colony	Monoclonal stable cell line with TALEN- or CRISPR-Cas9-mediated genome modifications.	TALEN, CRISPR-Cas9
	Cell bank	Create cell bank of monoclonal stable cell line with TALEN or CRISPR-Cas9-mediated genome modifications.	TALEN, CRISPR-Cas9
Transgenic mouse services	Transgenic mouse	Transgenic mice with TALEN- or CRISPR-Cas9-mediated genome modifications.	TALEN, CRISPR-Cas9

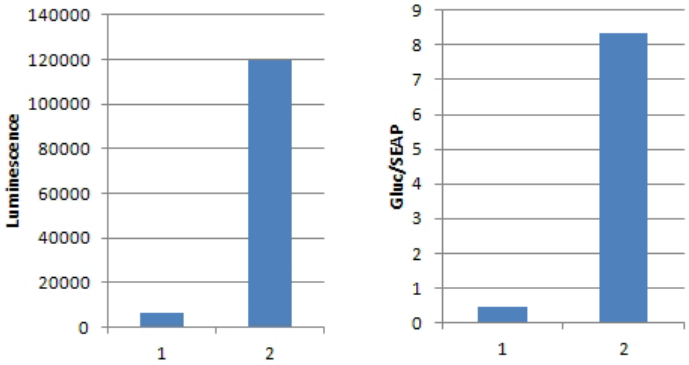
Episomal validation

The surrogate reporter assay is a plasmid-level functional validation. The surrogate reporter plasmid consists of a reporter gene expression cassette and the target sequence of the genome editing tool being validated.

To validate a site-specific transactivator (e.g. TALE-TF), the promoter region of a reporter gene expression cassette is replaced with the target sequence. After co-transfection, a functional transactivator will recognize and bind to the target sequence, activating the transcription of reporter gene.

To validate a site-specific nuclease (e.g. TALEN or CRIPSR-Cas9), a surrogate reporter plasmid is constructed by disrupting the reporter gene ORF with an in-frame stop codon followed by the target sequence. A donor plasmid with a promoter-less wild type reporter gene ORF is also co-transfected. A functional site-specific nuclease will generate a double-strand break on the target sequence, stimulating homologous recombination between the surrogate reporter plasmid and donor plasmid. Thus the reporter gene ORF in the expression cassette is repaired, and up-regulation of reporter gene expression will be detected. (Figure 16)





Sample	1	2
Control TALENs	+	
eGFP-TALENs		+
Surrogate reporter*	+	+
Donor plasmid**	+	+

*The surrogate reporter plasmid was constructed by disrupting a CMV-driven Gaussia luciferase (GLuc) with an in-frame stop codon followed by eGFP TALEN target sequences.

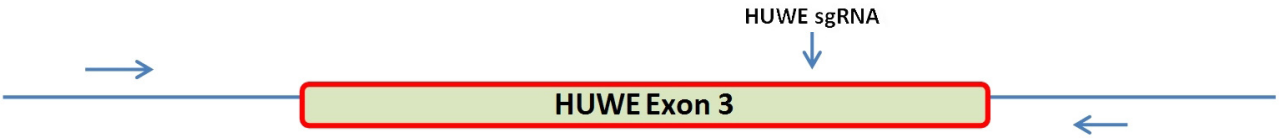
**The donor plasmid contains a promoter-less wild type GLuc, which can replace the interrupted GLuc in the surrogate reporter plasmid and restore GLuc expression through homologous recombination, which is enhanced by TALEN cleavage.

Figure 16. TALENs enhance homologous recombination. HEK293T cells in a 6-well plate were co-transfected with the eGFP-TALEN pair (1 μg), the surrogate reporter plasmid (0.5 μg) and the donor plasmid (0.5 μg). 48hours post-transfection, the restored Gluc activity was determined to evaluate the TALEN function. Internal control SEAP activity was used for normalization.

Chromosomal validation

To validate a site-specific transactivator (e.g. TALE-TF) at the chromosomal level, qPCR primers are designed and qPCR performed post-transfection to measure the change in expression level of the target gene induced by the transactivator.

To validate a site-specific nuclease (e.g. TALEN or CRISPR-Cas9), we can use the mismatch cleavage assay to detect the presence of indels caused by NHEJ-mediated DSB repair at the specific target site of the chromosome. Genomic DNA is extracted and PCR amplified using primers specific to the target gene post-transfection. The PCR products are purified, denatured and reannealed, and then digested with a mismatch cleavage enzyme (e.g. T7 endonuclease I). The expected digestion product sizes will be detected if the site-specific nuclease is functional.



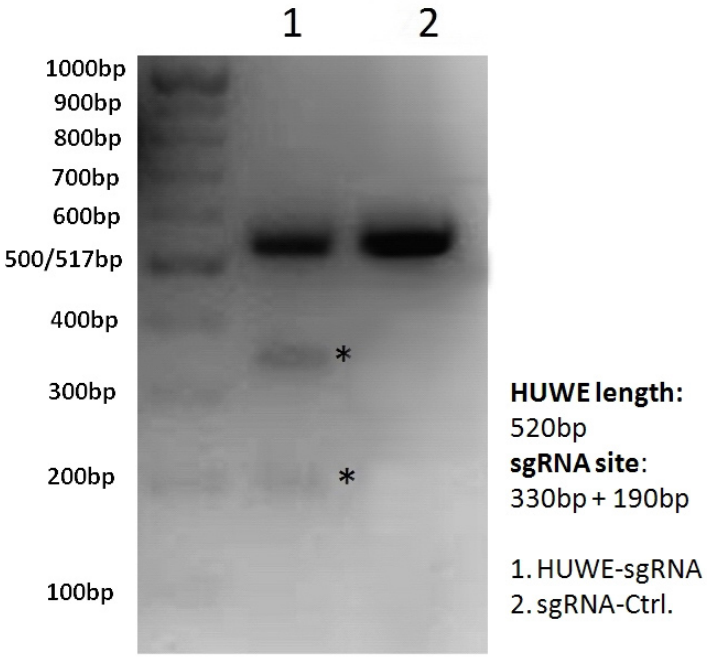


Figure 17. Human genome sgRNA/ Cas9 gene targeting of HUWE.
(A) HUWEI sgRNA design. Expected bands of T7 endonuclease I (T7 ENI) digestion are 330bp+190bp;
(B) HUWEI-sgRNA/Cas9 clones were transfected into HEK293T cells in a 6-well plate. The medium was changed at 16h post transfection. Cells were harvested at 40h post transfection. Genomic DNA was then extracted for PCR. PCR products were purified by gel purification. 8uL of purified product was mixed with 1uL 10x NEB buffer #2, followed by annealing in a PCR machine programmed as below:
94 °C10min, (93°C-25s, 92°C-25s) x35, 20°C5min, 4°C
After annealing, the products were cut with 2U T7 Endonuclease I for 60mins at 37°C.

Donor services

GeneCopoeia offers customized donor clone design and construction services. Donor clones are customized plasmids designed to specifically transfer your gene of interest, selection marker or other genetic elements into a target site via HR-mediated repair of DSBs induced by site-specific genome editing tools. Donor vectors are available with several options for selection markers and genetic elements to meet your experimental needs.

Donor Vector Types

Vector	Promoter	Reporter Gene	Selection Marker
pDonor-01	EFa1	copGFP	Puromycin/TK
pDonor-02	CMV	copGFP	Neomycin/TK
pDonor-03	EFa1	N/A	Puromycin/TK
pDonor-04	CMV	N/A	Neomycin/TK

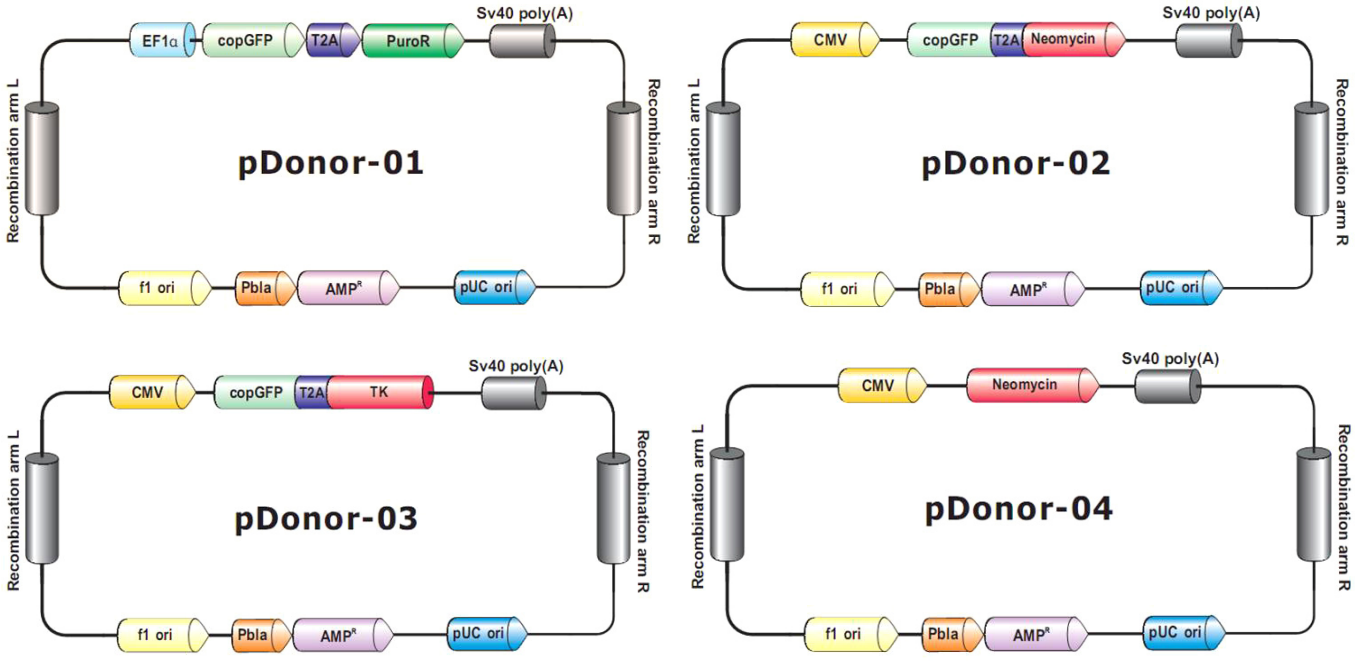
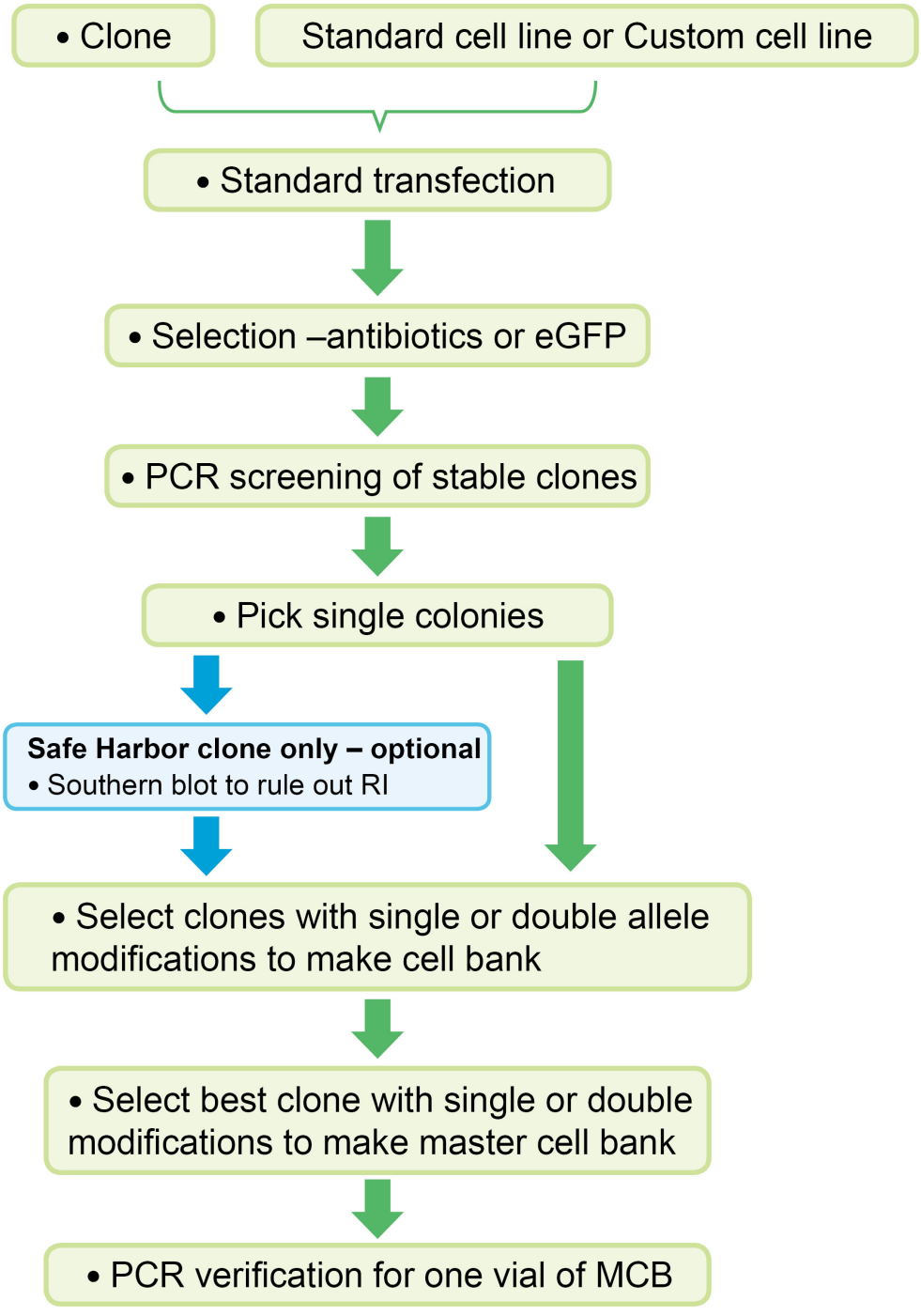


Figure 18. Maps of Donor vectors

Stable cell line services

GeneCopoeia offers monoclonal stable cell line service with customized TALEN- or CRISPR-Cas9-mediated genome modifications. Cell banking service is also available.

TALEN/CRISPR Stable Cell Line Development Services



Safe-harbor genome integration

The modification of the human genome by insertion of genes of interest and other genetic elements in unique site(s) of chromosome(s) is of great value for cell engineering. However, random integration of the transgene can present a threat of unpredicted insertion or mutagenesis. The AAVS1 (also known as PPP1R2C locus) in human chromosome 19 is a well-validated “safe harbor” for hosting DNA fragments with expected function. It has an open chromatin structure and is transcription-competent. Most importantly, there are no known adverse effects on the cell resulting from the inserted DNA fragment of interest.

Safe-harbor gene knock-in kit

The Genome-TALER™ human AAVS1 safe harbor gene knock-in kit is designed to specifically transfer your gene of interest, selection marker or other genetic elements from a donor plasmid into the AAVS1 safe harbor site on human chromosome 19 via TALEN-mediated homologous recombination (HR) for long term, stable expression.

Product name	Description	Included in (Cat#)
AAVS1 TALEN pair clones	Create DSB at the AAVS1 locus on human chromosome 19 to stimulate HR.	SH-AVS-K100, SH-AVS-K000
AAVS1 donor vector	For cloning GOI to be knocked in. Contains two AAVS1 flanking arms for HR as well as GFP and puromycin for detection and selection.	SH-AVS-K100
AAVS1 RFP control	Positive control. Contains two AAVS1 flanking arms for HR as well as RFP/GFP and puromycin for detection and selection.	SH-AVS-K100, SH-AVS-K000
5’ HR primer pair	PCR primer pair for detecting 5’ recombination site at AAVS1 locus	SH-AVS-K100, SH-AVS-K000
3’ HR primer pair	PCR primer pair for detecting 3’ recombination site at AAVS1 locus	SH-AVS-K100, SH-AVS-K000

Safe-harbor ORF knock-in clones

Human AAVS1 safe harbor ORF knock-in clones are a collection of more than 18,000 ORF knock-in donor clones constructed for specially transferring the ORFs of customers' genes of interest from an AAVS1 donor plasmid to the AAVS1 site for safe integration and single copy gene expression. These clones are compatible with the Genome-TALER™ human AAVS1 safe harbor gene knock-in kit, and gene transfer occurs via TALEN-mediated HR.

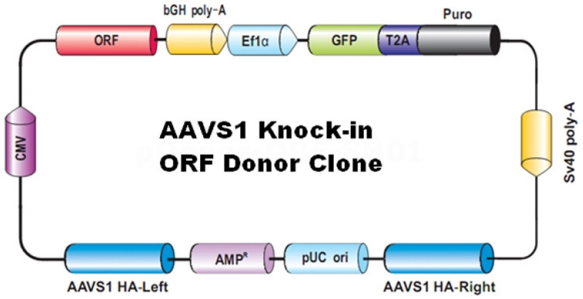


Figure19. Human AAVS1 safe harbor knockin clone

Knockin ORF clones by disease or gene families

Disease Families	ORF cDNAs
Cardiovascular diseases	1596
Congenital anomalies and genetic diseases	3978
Digestive system diseases	864
Diseases of the blood and blood-forming organs	1886
Endocrine, metabolic and nutrition diseases	1784
Immunologic diseases	3644
Infectious diseases	3536
Mental disorders	1805
Musculoskeletal system diseases	946
Neoplasms	8950
Nervous system and sense organs	2404
Respiratory system diseases	565
Urologic and genital diseases	1304
Skin and connective tissue diseases	866
Symptoms and general pathology	2022

Gene Families	ORF cDNAs
Cytokines	315
Cytokine receptors	152
Druggable target genes	6245
G protein-coupled receptors	718
Histone modification enzymes	38
Histone proteins	66
Ion channels	463
Membrane-bound proteins	2138
Nuclear hormone receptors	105
Proteases	625
Protein kinases	933
Protein phosphatases	293
Surface antigens (CD)	263
Transcription factors	1096
Organelle markers	77
Other kinases	201

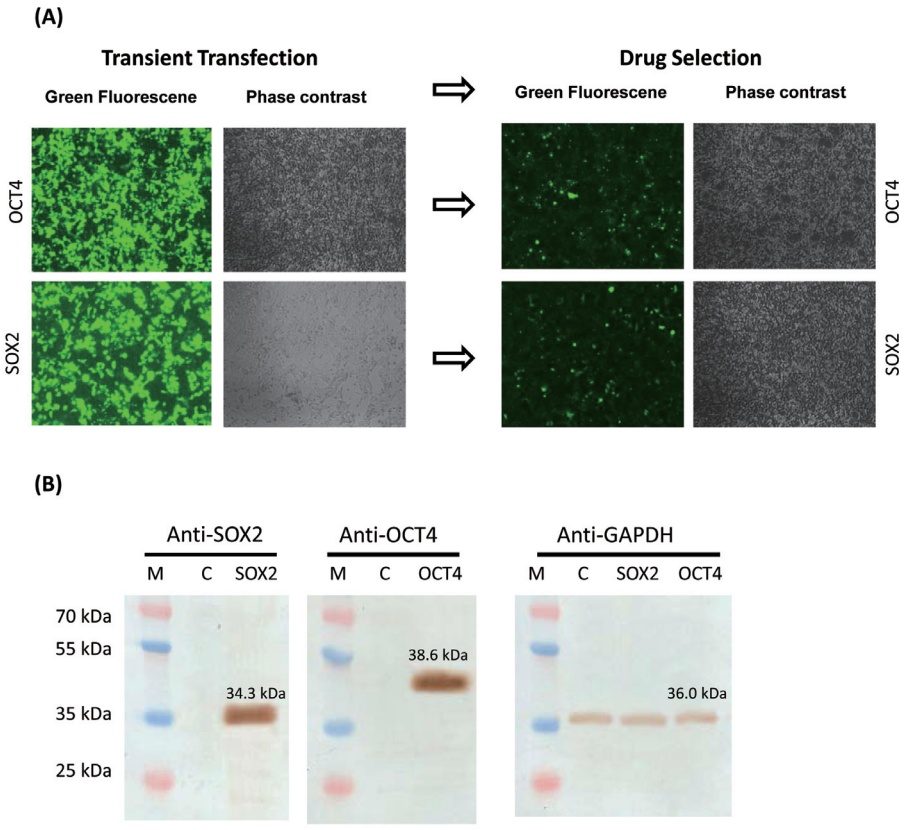


Figure 20: (A) OCT4 or SOX2 ORF knockin clones were co-transfected with the AAVS1 TALEN Pair into HEK293T cells. Cells were subcultrured for 48 hr post-transefection and selected with puromycin (1µg/ml) for 2 weeks. The expression of CopGFP was detected using a microscope (Nikon Eclipse Ti) 48h post-transfection or after 2 weeks of drug selection. (B) Western blot analysis of proteins from HEK293T cells stably integrated with SOX2 or OCT4 at the AAVS1 site, with cells alone as negative control where endogenous Sox2 or OCT4 protein levels were too low to be detected in the same blot.

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All-in-One™ qPCR Reagents and Validated Primers

Overview

All-in-One™ SYBR® Green qPCR Mix with validated gene-specific primers provide universal qPCR reaction conditions and robust quantitative PCR data without high costs.

The All-in-One™ qPCR Mix uses high-fidelity hot-start polymerase, an optimized reaction buffer and high-quality dNTPs to enable specific and sensitive amplification from even low-copy number RNA (cDNA) or DNA samples.

All-in-One™ qPCR Validated Primers get the job done by delivering reliable and reproducible high performance in quantitative PCR assays.

All-in-One™ First-Strand cDNA Synthesis Kit offers a robust solution for cDNA synthesis from almost any RNA source. The kit includes a reverse transcriptase and a specialized set of reagents designed to yield cDNA that is optimal for gene cloning, cDNA library creation and qPCR amplification.

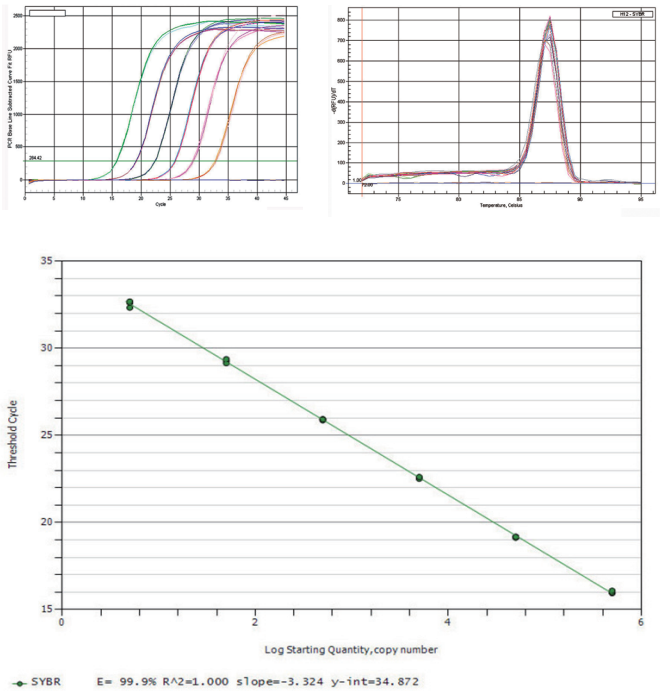

Figure 1. The amplification efficiency and detection sensitivity of the 2X All-in-One™ qPCR Mix are assessed by standard curves made by gradient dilution of plasmid DNA. The peak values from amplification and melting curves show that very high sensitivity can be obtained using All-in-One™ qPCR Mix which can detect as low as 5 molecules. At the same time, high amplification efficiency has also been shown by a good linear relationship among each concentration.

Advantages

Uniform reaction condition

Reduce experimental design time

Robust efficiency and sensitivity

Ensure reliable quantitation even for low-copy genes

High specificity

Absence of non-specific amplification and primer-dimers ensures reproducible data

Validation and precision

Human-, mouse- and rat-specific primers are designed by a proprietary algorithm and validated for precision performance

Primer validation includes melting curve to ensure amplification of the correct target DNA

GeneCopoeia™
Expressway to Discovery

All-in-One™ qPCR Reagents and Validated Primers

Catalog number	Product	Description
AOPR-0200 AOPR-0600	All-in-One qPCR Mix (20 µl x 200 or 600 qPCR reactions)	High-fidelity, hot-start DNA polymerase, optimized reaction buffer and dNTPs
AORT-0020 AORT-0050	All-in-One First-Strand cDNA Synthesis Kit (20 or 50 synthesis reactions)	M-MLV RT (Rnase H-), reaction buffer, Rnase inhibitor, dNTPs, Oligo (dT) 18, random primer and ddH_2O
Variable	All-in-One qRT-PCR Primers (20 µl x 500 reactions)	Validated human, mouse and rat qPCR primers

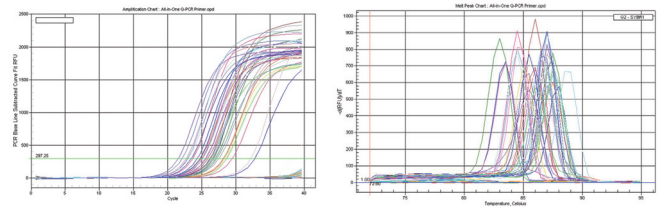

Figure 2. Forty-five pairs of gene-specific All-in-One™ qPCR primers were experimentally validated to yield a single dissociation curve peak and to generate a single amplification of the correct size for the targeted genes. A cDNA pool, containing reverse transcribed products of total RNA from 10 different human tissues (lung, liver, testicle, ovary, spleen, brain, placenta, pancreas, heart and mammary), was used as the qPCR validation template.

To order

Please visit www.genecopoeia.com or contact us directly.

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Tel	+1 (301) 762-0888
Toll free	+1 (866) 360-9531
Fax	+1 (301) 762-3888
Website	www.genecopoeia.com

GeneCopoeia™ Expressway to Discovery

Gene and miRNA qPCR Arrays

ExProfile™ Gene qPCR Arrays

Pathway Gene qPCR Arrays
Cancer Gene qPCR Arrays
Disease & Gene Group qPCR Arrays
Custom Gene qPCR Arrays
qPCR Reagents

MiProfile™ miRNA qPCR Arrays

Cancer miRNA qPCR Arrays
Focus-Group miRNA qPCR Arrays
miRNome qPCR Arrays
Custom miRNA qPCR Arrays
miRNA qPCR Reagents

Custom qPCR Arrays and Services

Data Analysis Tool

GeneCopoeia™
Expressway to Discovery

Introduction

qPCR Array System

GeneCopoeia qPCR arrays are a reliable yet easy-to-use tool to study gene expression profiling using SYBR® Green-based real-time PCR technology. The 96- or 384-well arrays are designed for profiling a panel of genes or miRNAs related to a specific disease or pathway in various tissues or cells. The resulting differential expressions help researchers to identify those that are biologically significant and relevant to their research.

qPCR arrays can also be used for your microarray and NGS data validation, biomarker discovery, and gene function study verification.

Why GeneCopoeia qPCR Array System?

Validated Primers
Each primer is designed using a proprietary algorithm and has been experimentally validated

Robust Performance
Stringent QC ensures high quality, specificity, and sensitivity (detects as low as 4 copies of RNA)

Research Focused
Disease or pathway-focused, or custom-made with your own genes or miRNAs of interest

Category	Product	Description
Gene qPCR Arrays	ExProfile™ cancer gene qPCR arrays	21 different cancer types available
	ExProfile™ pathway-focused gene qPCR arrays	60 different pathway arrays available
	ExProfile™ Disease and gene group qPCR arrays	17 different gene group or disease-focused arrays available
	qPCR reagents	RNAzol® RT RNA isolation kit All-in-One™ first-strand cDNA synthesis kit All-in-One™ qPCR mix All-in-One™ qPCR validated primers
miRNA qPCR Arrays	miProfile™ miRNome qPCR arrays	Human: Covering 1,700+ miRNAs based on miRBase v18 Mouse: Covering 800+ miRNAs based on miRBase v18
	miProfile™ cancer miRNA qPCR arrays	Cancer related Human: 15 cancer types available Mouse: 11 cancer types available
	miProfile™ disease and focusgroup miRNA qPCR arrays	Disease- or other focus-group related
	miRNA qPCR reagents	RNAzol® RT RNA isolation kit All-in-One™ qPCR mix All-in-One™ miRNA qRT-PCR detection kit All-in-One™ miRNA first-Strand cDNA synthesis kit All-in-One™ miRNA qPCR validated primers
Custom PCR Arrays & Services	Gene or miRNA custom qPCR arrays and services	96-well format (6 layouts) and 384-well format (8 layouts) Capable of in-house array processing and data analysis
Data Analysis Tool	Online data analysis tool	Free and easy-to-use

ExProfile™ Gene qPCR Arrays

The qPCR array system allows researchers to amplify 96- or 384-well gene-specific products under a uniform cycling condition. In each 96-well plate, there are up to 84 pairs of qPCR primers and 12 wells of controls which are used to monitor the efficiency of the entire experimental process – from reverse transcription to qPCR reaction.

Gene qPCR Array Layout (96-Well)

	1	2	3	4	5	6	7	8	9	10	11	12
A	1	2	3	4	5	6	7	8	9	10	11	12
B	13	14	15	16	17	18	19	20	21	22	23	24
C	25	26	27	28	29	30	31	32	33	34	35	36
D	37	38	39	40	41	42	43	44	45	46	47	48
E	49	50	51	52	53	54	55	56	57	58	59	60
F	61	62	63	64	65	66	67	68	69	70	71	72
G	73	74	75	76	77	78	79	80	81	82	83	84
H	GDC	GDC	HK1	HK2	HK3	HK4	HK5	HK6	RT	RT	PCR	PCR

- **Wells 1-84:** Pathway or disease related genes
- **HK1-6:** Housekeeping genes as endogenous positive controls as well as for array normalization
- **GDC:** Genomic DNA controls to detect genomic DNA contamination
- **RT:** Spike-in reverse transcription controls to monitor the efficiency of the RT reaction
- **PCR:** Positive PCR controls to verify the PCR efficiency

How qPCR Array Works

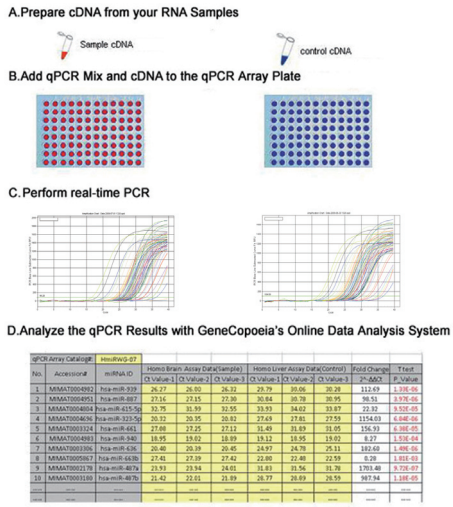


Figure 1. qPCR array experimental work flow

A. Convert total RNA into cDNA with All-in-One™ First-Strand cDNA Synthesis Kit

B. Mix cDNA template and All-in-One™ qPCR Mix and aliquot the mixture across the PCR Array

C. Run the array plate in real-time PCR instrument (Bio-Rad, or Applied Biosystem, or Roche)

D. Analyze qPCR array data using GeneCopoeia's free online data analysis tool

Performance Data

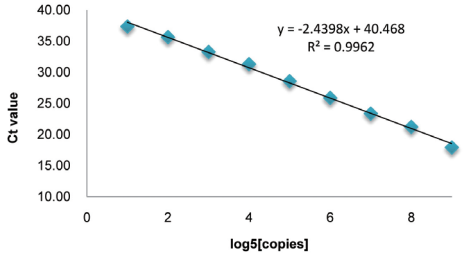


Figure 2. Broad linear range and high sensitivity Mouse total RNA with serially diluted spike-in control RNA were reverse-transcribed using All-in-One™ First Strand cDNA Synthesis Kit. The reverse-transcribed cDNA samples were detected using All-in-One™ qPCR Mix and spike-in control specific primers deposited in a 96-well plate. The resulting Ct values were plotted against the log5 of the amount of spike-in control RNA. The data demonstrated a broad linear dynamic range from 4 to $1.6*10^6$ copies of input RNA as well as high sensitivity.

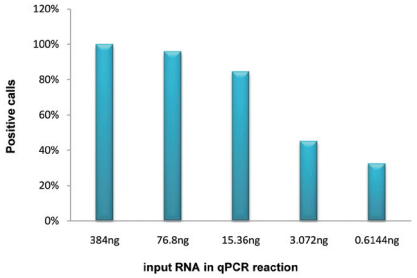


Figure 3. High positive calls with as little as 15.36 ng of total RNA Different amounts of MCF_7 total RNA (1000, 200, 40, 8, 1.6ng) were analyzed with the Human Breast Cancer Gene qPCR Arrays (PAG-HGBE96-01).The percentage of positive calls (Ct < 35) is plotted against the input amount of total RNA in each qPCR reaction.

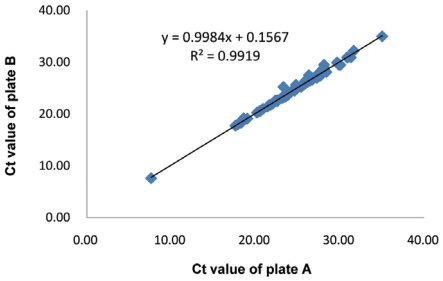


Figure 4. High inter-array reproducibility Two ExProfile™ qPCR gene array replicates (plate A and B) were analyzed using human total RNA (10-tissue mix) on the Bio-Rad iQ5. The Ct values of the replicate plates were plotted against each other. $R^2 > 0.99$ was observed for high inter-array reproducibility. $R^2 > 0.99$ was also observed for intra-array reproducibility (data not shown).

ExProfile™ Pathway Gene qPCR Arrays

ExProfile™ Pathway Gene qPCR Arrays profile the expression of pathway-related genes, which are carefully chosen for their close pathway correlation based on a thorough literature search of peer-reviewed publications. Arrays are available for expression profiling of specific types of pathway-related genes.

Catalog #	Product Name	# of Genes	# of Plates
PAG-HPCD96	ExProfile™ Human Cancer Drug Resistance & Metabolism Related Gene qPCR Array	84	1
PAG-HPCR96	ExProfile™ Human Cytokine Receptor Related Gene qPCR Array	84	1
PAG-HPEP96	ExProfile™ Human EGF/PDGF Signaling Related Gene qPCR Array	84	1
PAG-HPFT96	ExProfile™ Human FoxP3 Target Genes qPCR Array	84	1
PAG-HPGT96	ExProfile™ Human Growth and Development Toxicity Related Gene qPCR Array	84	1
PAG-HPHI96	ExProfile™ Human Insulin Signaling Related Gene qPCR Array	84	1
PAG-HPIA96	ExProfile™ Human Innate & Adaptive Immune Response Related Gene qPCR Array	84	1
PAG-HPIC96	ExProfile™ Human Inflammatory Cytokines & Receptors Relayed Gene qPCR Array	84	1
PAG-HPIF96	ExProfile™ Human Interferon Signaling & Response Related Gene qPCR Array	84	1
PAG-HPII96	ExProfile™ Human Innate Immune Signaling Related Gene qPCR Array	84	1
PAG-HPIN96	ExProfile™ Human Interferon Related Gene qPCR Array	84	1
PAG-HPJS96	ExProfile™ Human JAK/STAT Signaling Related Gene qPCR Array	84	1
PAG-HPKA96	ExProfile™ Human NFKB Signaling Pathway Related Gene qPCR Array	84	1
PAG-HPPK96	ExProfile™ Human PI3K-AKT Signaling Realted Gene qPCR Array	84	1
PAG-HPRA96	ExProfile™ Human Inflammatory Response and Autoimmunity Related Gene qPCR Array	84	1
PAG-HPST96	ExProfile™ Human Signal Transduction Related Gene qPCR Array	84	1
PAG-HPTB96	ExProfile™ Human T-cell and B-cell Activation Related Gene qPCR Array	84	1
PAG-HPTC96	ExProfile™ Human Cell Cycle Toxicity and Cancer Related Gene qPCR Array	84	1
PAG-HPTG96	ExProfile™ Human TGF-β Signaling Related Gene qPCR Array	84	1
PAG-HPTH96	ExProfile™ Human Th1-Th2-Th3 Related Gene qPCR Array	84	1

Catalog #	Product Name	# of Genes	# of Plates
PAG-HPTM96	ExProfile™ Human Tumor Metastasis Related Gene qPCR Array	84	1
PAG-HPTS96	ExProfile™ Human T helper 17 (Th17) Related Gene qPCR Array	84	1
PAG-HPAF96	ExProfile™ Human Autophagy Related Gene qPCR Array	84	1
PAG-HPAG96	ExProfile™ Human Angiogenesis Related Gene qPCR Array	84	1
PAG-HPAN96	ExProfile™ Human Antigen Processing & Presentation Related Gene qPCR Array	84	1
PAG-HPAS96	ExProfile™ Human AMPK Signaling Related Gene qPCR Array	336	4
PAG-HPBE96	ExProfile™ Human Breast Cancer & Estrogen Receptor Signaling Related Gene qPCR Array	84	1
PAG-HPCC96	ExProfile™ Human Cell Cycle Related Gene qPCR Array	84	1
PAG-HPCS96	ExProfile™ Human cAMP/Ca2+ Signaling Related Gene qPCR Array	84	1
PAG-HPDA96	ExProfile™ Human Dendritic & Antigen Presenting Cell Related Gene qPCR Array	84	1
PAG-HPDM96	ExProfile™ Human Drug Metabolism Related Gene qPCR Array	84	1
PAG-HPDR96	ExProfile™ Human DNA Damage and Repair Related Gene qPCR Array	84	1
PAG-HPEA96	ExProfile™ Human Extracellular Matrix and Adhesion Molecules Related Gene qPCR Array	84	1
PAG-HPEO96	ExProfile™ Human Electron Transport Toxicology Related Gene qPCR Array	84	1
PAG-HPES96	ExProfile™ Human Embryonic Stem Cells Related Gene qPCR Array	84	1
PAG-HPET96	ExProfile™ Human Endothelial Cell Biology Related Gene qPCR Array	84	1
PAG-HPGF96	ExProfile™ Human Angiogenic Growth Factors & Angiogenesis Inhibitors Related Gene qPCR Array Related Gene qPCR Array	84	1
PAG-HPGO96	ExProfile™ Human General Toxicology Related Gene qPCR Array	336	4
PAG-HPHD96	ExProfile™ Human Hedgehog Signaling Related Gene qPCR Array	84	1
PAG-HPHH96	ExProfile™ Human HIV Infection and Host Response Related Gene qPCR Array	84	1
PAG-HPHM96	ExProfile™ Human Hematopoietic Stem Cells and Hematopoiesis Related Gene qPCR Array	84	1
PAG-HPHO96	ExProfile™ Human Hypoxia Signaling Related Gene qPCR Array	84	1
PAG-HPIM96	ExProfile™ Human Immunology Related Gene qPCR Array	84	1
PAG-HPIP96	ExProfile™ Human Immune Complement Related Gene qPCR Array	84	1

Pathway qPCR Arrays

Catalog #	Product Name	# of Genes	# of Plates
PAG-HPLC96	ExProfile™ Human Lipoprotein Signaling & Cholesterol Metabolism Related Gene qPCR Array	84	1
PAG-HPLR96	ExProfile™ Human Tumor Necrosis Factor (TNF) Ligand and Receptor Related Gene qPCR Array	84	1
PAG-HPMK96	ExProfile™ Human MAP Kinase Signaling Related Gene qPCR Array	84	1
PAG-HPNI96	ExProfile™ Human Neuroscience Ion Channels & Transporters Related Gene qPCR Array	84	1
PAG-HPNL96	ExProfile™ Human Nuclear Receptors and Coregulators Related Gene qPCR Array	84	1
PAG-HPNO96	ExProfile™ Human Nitric Oxide Signaling Related Gene qPCR Array	84	1
PAG-HPNR96	ExProfile™ Human Neurogenesis and Neural Stem Cell Related Gene qPCR Array	84	1
PAG-HPNS96	ExProfile™ Human Notch Signaling Related Gene qPCR Array	84	1
PAG-HPNT96	ExProfile™ Human Neurotransmitter Receptors and Regulators Related Gene qPCR Array	84	1
PAG-HPOA96	ExProfile™ Human Oxidative Stress and Antioxidant Defense Related Gene qPCR Array	84	1
PAG-HPOG96	ExProfile™ Human Osteogenesis Related Gene qPCR Array	84	1
PAG-HPSC96	ExProfile™ Human Stem Cell Related Gene qPCR Array	420	5
PAG-HPSE96	ExProfile™ Human Stress & Toxicity Related Gene qPCR Array	84	1
PAG-HPTN96	ExProfile™ Human T Cell Anergy & Immune Tolerance Related Gene qPCR Array	84	1
PAG-HPUP96	ExProfile™ Human Ubiquitination (Ubiquitylation) Related Gene qPCR Array	84	1
PAG-HPWT96	ExProfile™ Human Targets of Wnt/?-catenin Signaling Related Gene qPCR Array	84	1

ExProfile™ Cancer Gene qPCR Arrays

ExProfile™ Cancer Gene qPCR Arrays profile the expression of cancer-related genes, which are carefully chosen for their close cancer correlation based on a thorough literature search of peer-reviewed publications. Twenty-one different cancer types are available for human.

Catalog #	Product Name	# of Genes	# of Plates
PAG-HCAD96	Exprofile™ Human Adenocarcinoma Gene qPCR Array	168	2
PAG-HCBA96	Exprofile™ Human Brain Cancer Gene qPCR Array	252	3
PAG-HCBE96	Exprofile™ Human Breast Cancer Gene qPCR Array	504	6
PAG-HCBL96	Exprofile™ Human Bladder Cancer Gene qPCR Array	420	5
PAG-HCCR96	Exprofile™ Human Colorectal Cancer Gene qPCR Arrays	336	4
PAG-HCCV96	Exprofile™ Human Cervical Cancer Gene qPCR Arrays	84	1
PAG-HCED96	Exprofile™ Human Endometrial Cancer Gene qPCR Arrays	82	1
PAG-HCHN96	Exprofile™ Human Head and Neck Cancer Gene qPCR Arrays	504	6
PAG-HCKD96	Exprofile™ Human Kidney Cancer Gene qPCR Arrays	84	1
PAG-HCLK96	Exprofile™ Human Leukemia Gene qPCR Arrays	504	6
PAG-HCLU96	Exprofile™ Human Lung Cancer Gene qPCR Arrays	504	6
PAG-HCLV96	Exprofile™ Human Liver Cancer Gene qPCR Arrays	168	2
PAG-HCLY96	Exprofile™ Human Lymphoma Gene qPCR Arrays	420	5
PAG-HCML96	Exprofile™ Human Myeloma Gene qPCR Arrays	84	1
PAG-HCOV96	Exprofile™ Human Ovarian Cancer Gene qPCR Arrays	336	4
PAG-HCPC96	Exprofile™ Human Pancreatic Cancer Gene qPCR Arrays	168	2
PAG-HCPS96	Exprofile™ Human Prostate Cancer Gene qPCR Arrays	412	5
PAG-HCSK96	Exprofile™ Human Skin Cancer Gene qPCR Arrays	252	3
PAG-HCSM96	Exprofile™ Human Stomach Cancer Gene qPCR Arrays	168	2
PAG-HCTR96	Exprofile™ Human Thyroid Cancer Gene qPCR Arrays	84	1
PAG-HCTT96	Exprofile™ Human Testicular Cancer Gene qPCR Arrays	68	1

ExProfile™ Disease and Gene Group qPCR Arrays

ExProfile™ disease qPCR arrays and ExProfile™ gene group qPCR arrays can be used to study the expression profiling of specific disease-related genes and the expression profiling of functional gene groups respectively. The genes on both types of arrays are carefully chosen based on a thorough literature search of peer-reviewed publications.

Catalog #	Product Name	# of Genes	# of Plates
PAG-HDHT96	ExProfile™ Human Huntingtons Disease Related Gene qPCR Array	84	1
PAG-HDMD96	ExProfile™ Human Mood Disorder Related Gene qPCR Array	336	4
PAG-HDND96	ExProfile™ Human Neurodegeneration Related Gene qPCR Array	84	1
PAG-HFBC96	ExProfile™ Human Blood Coagulation Related Gene qPCR Array	84	1
PAG-HFCK96	ExProfile™ Human Chemokines & Receptors Related Gene qPCR Array	84	1
PAG-HFDS96	ExProfile™ Human Drug Transporters Related Gene qPCR Array	84	1
PAG-HFGR96	ExProfile™ Human Growth Factor Related Gene qPCR Array	84	1
PAG-HFHE96	ExProfile™ Human Histone Modification Enzyme Related Gene qPCR Array	84	1
PAG-HFHS96	ExProfile™ Human Heat Shock Proteins Related Gene qPCR Array	84	1
PAG-HFIO96	ExProfile™ Human Ion Channels Related Gene qPCR Array	336	4
PAG-HFNH96	ExProfile™ Human Nuclear Hormone Receptors Related Gene qPCR Array	84	1
PAG-HFNP96	ExProfile™ Human Neurotrophin and Receptors Related Gene qPCR Array	84	1
PAG-HFPF96	ExProfile™ Human Protein Phosphatases Related Gene qPCR Array	168	2
PAG-HFPO96	ExProfile™ Human Protein Kinases Related Gene qPCR Array	504	6
PAG-HFPS96	ExProfile™ Human Proteases Related Gene qPCR Array	504	6
PAG-HFSA96	ExProfile™ Human Surface Antigens (CD) Related Gene qPCR Array	252	3
PAG-HFSM96	ExProfile™ Human Cell Surface Markers Related Gene qPCR Array	84	1

ExProfile™ Custom Gene qPCR Arrays

GeneCopoeia can also make custom gene qPCR arrays for your own gene list. Simply provide us with a list of gene accession numbers and instrument model, and we will help you to build custom qPCR arrays for your specific instrument type.

Gene qPCR Array Reagents and Validated Primers

RNAzol® RT RNA Isolation Reagent

RNAzol® RT RNA Isolation Kit is the most effective reagent for isolation of total RNA and small RNA from human, animal, plant, bacterial and viral origin. (Catalog#: E01010A)

All-in-One™ First-Strand cDNA Synthesis Kit

The All-in-One™ First-Strand cDNA Synthesis Kit includes a reverse transcriptase and a specialized set of reagents designed to yield cDNA that is optimal for gene cloning, cDNA library creation and quantitative PCR amplification.

Catalog #	Product
AORT-0020	All-in-One™ First-Strand cDNA Synthesis Kit (20 reactions)
AORT-0060	All-in-One™ First-Strand cDNA Synthesis Kit (60 reactions)

All-in-One™ qPCR Mix

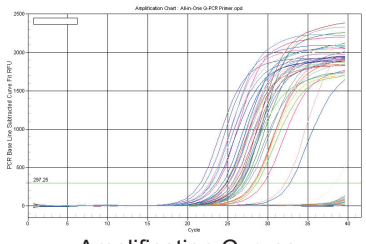
The All-in-One™ qPCR Mix uses high-fidelity hot-start polymerase, an optimized reaction buffer and high-quality dNTPs to enable specific and sensitive amplification from even low-copy RNA (cDNA) or DNA samples.

Catalog#	Product
AOPR-0200	All-in-One™ qPCR Mix (200 qPCR reactions)
AOPR-0600	All-in-One™ qPCR Mix (600 qPCR reactions)
AOPR-1000	All-in-One™ qPCR Mix (1000 qPCR reactions)
AOPR-4000	All-in-One™ qPCR Mix (4000 qPCR reactions)

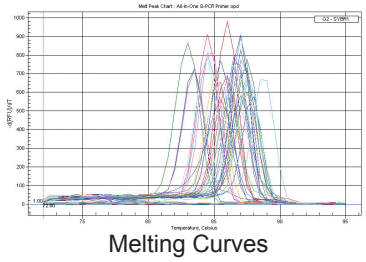
All-in-One™ qPCR Validated Primers

Experimentally validated gene-specific primers for human, mouse and rat

Catalog#	Product
Variable	All-in-One™ qPCR Primer(20 µl x 500 reactions)



Amplification Curves



Melting Curves

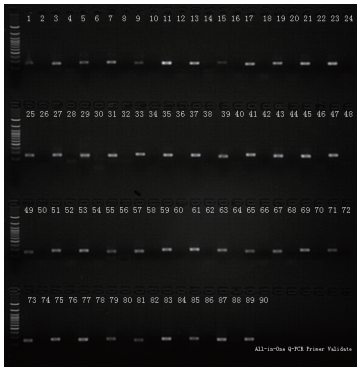


Figure 5. Forty-five pairs of gene-specific All-in-One™ qPCR primers were experimentally validated to yield a single dissociation curve peak and to generate a single amplification of the correct size for the targeted genes. A cDNA pool containing reverse transcribed products of total RNA from 10 different human tissues (lung, liver, testicle, ovary, spleen, brain, placenta, pancreas, heart and mammary glands), was used as the qPCR validation template.

miProfile™ miRNA qPCR Array System

The miProfile™ miRNA qPCR Arrays are designed for profiling the expression of pre-defined or customized sets of miRNAs in various tissues or cells of interest to discover the miRNAs that are specifically important to your research. Each 96-well plate contains up to 84 pairs of PCR primers (forward: miRNA-specific primer; reverse: universal primer), which are pre-deposited in each well.

Available miRNA qPCR Array Products

- miRNome qPCR Arrays
- Cancer miRNA qPCR Arrays
- Disease and Focus-Group miRNA qPCR Arrays
- Custom miRNA qPCR Arrays

Required Reagents

- RNAzol® RT RNA Isolation Reagent
- All-in-One™ miRNA First-Strand cDNA Synthesis Kit
- All-in-One™ miRNA qRT-PCR Detection Kit
- All-in-One™ qPCR Mix

Advantages

Genome-wide or focused coverage

- Largest genome-wide miRNA coverage
- Cancer-related groups
- Customized miRNA arrays for focused study

Validated miRNA primers

- Each miRNA primer is designed using a proprietary algorithm and experimentally validated

Robust performance

- Sensitive – Detect miRNA from as little as 10 pg of small RNA or 20 pg of total RNA
- Specific – Be able to distinguish miRNAs with single nucleotide mismatches.
- Broad linearity– Allow miRNAs at a variety of expression levels to be detected simultaneously
- Reproducible – High reproducibility (R^2>0.99) for inter-array and intra-array replicates

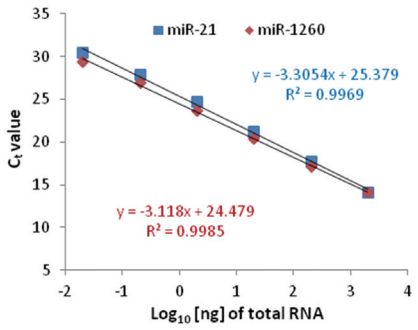


Figure 6. Broad linear range and high sensitivity Starting with a serially diluted amount of human colon cancer total RNA, miR-21 and miR-1260 were detected using All-in-One™ miRNA qRT-PCR Detection Kit . The resulting Ct values were plotted against the log10 of the amount of input total RNA. The data demonstrated a broad linear dynamic range from 20 pg to 2 µg of input total RNA as well as high sensitivity. This allows a variety of expression levels of miRNAs, including low abundant ones, to be detected simultaneously.

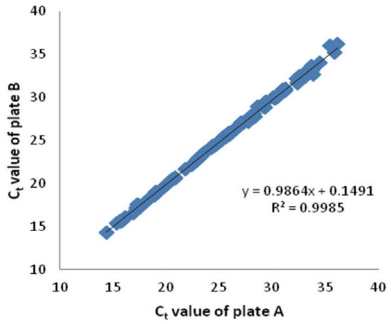


Figure 7. High inter-array reproducibility Two miProfile™ qPCR array replicates (plate A and B) were analyzed using human total RNA (10-tissue mix) on the Bio-Rad iQ5. The Ct values of the replicate plates were plotted against each other. R^2 > 0.99 were observed for high inter-array reproducibility. R^2 > 0.99 is also observed for intra-array reproducibility (data not shown)

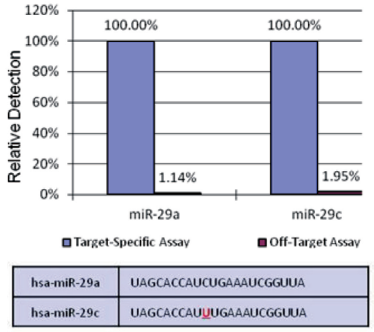


Figure 8. Specificity of miRNA detection miRNA miR-29a and miR-29c with one single nucleotide mismatch (B) can be distinguished. Relative detection, defined as a percentage of the perfect match (100% x 2 -△Ct), was calculated using the Ct values of on-target and off-target assays, which were performed to detect miRNA plasmid DNA templates using All-in-One™ miRNA qRT-PCR Detection Kits (A).

miProfile™ Cancer miRNA qPCR Arrays

miRNAs are known for their extensive involvement in cancer development and progression, and their altered expression patterns that may affect the cell cycle and survival program. The miProfile™ Cancer miRNA qPCR Arrays allow researchers to profile the differential expression of cancer-related miRNAs in order to study the role of miRNA in cancer pathogenesis, and identify markers for cancer classification, diagnosis, and prognosis.

Catalog#	Product Name	# of miRNAs	# of Plates
PAM-HC96	Human cancer miRNA qPCR arrays	420	5
PAM-HCN96	Human brain cancer miRNA qPCR arrays	84	1
PAM-HCB96	Human breast cancer miRNA qPCR arrays	168	2
PAM-HCX96	Human leukemia miRNA qPCR arrays	168	2
PAM-HCL96	Human lung cancer miRNA qPCR arrays	168	2
PAM-HCO96	Human ovarian cancer miRNA qPCR arrays	168	2
PAM-HCY96	Human bladder cancer miRNA qPCR arrays	79	1
PAM-HCC96	Human colorectal cancer miRNA qPCR arrays	84	1
PAM-HCE96	Human endometrial cancer miRNA qPCR arrays	84	1
PAM-HCG96	Human gastric cancer miRNA qPCR arrays	80	1
PAM-HCH96	Human hepatocellular carcinoma miRNA qPCR arrays	168	2
PAM-HCZ96	Human lymphoma miRNA qPCR arrays	84	1
PAM-HCM96	Human melanoma miRNA qPCR arrays	84	1
PAM-HCT96	Human head and neck cancer miRNA qPCR arrays	84	1
PAM-HCP96	Human pancreatic cancer miRNA qPCR arrays	84	1
PAM-HCQ96	Human prostate cancer miRNA qPCR arrays	84	1
PAM-MCB96	Mouse breast cancer miRNA qPCR arrays	84	1
PAM-MCN96	Mouse brain cancer miRNA qPCR arrays	84	1
PAM-MCO96	Mouse ovarian cancer miRNA qPCR arrays	84	1
PAM-MCQ96	Mouse prostate cancer miRNA qPCR arrays	84	1
PAM-MCC96	Mouse colorectal cancer miRNA qPCR arrays	84	1
PAM-MCH96	Mouse hepatocellular carcinoma miRNA qPCR arrays	84	1
PAM-MCL96	Mouse lung cancer miRNA qPCR arrays	84	1
PAM-MCM96	Mouse melanoma miRNA qPCR arrays	84	1
PAM-MCP96	Mouse pancreatic cancer miRNA qPCR arrays	84	1
PAM-MCT96	Mouse head and neck cancer miRNA qPCR arrays	84	1
PAM-MCX96	Mouse leukemia cancer miRNA qPCR arrays	84	1

miProfile™ Disease and Focus-Group miRNA qPCR Arrays

These arrays profile the expression of disease-related or other focus-group miRNAs, which are carefully chosen for their close disease, pathway, or process correlation, allowing researchers to study the differential expression of these miRNAs to gain understanding of the role of miRNA in disease pathogenesis or cellular pathways as well as to identify or validate key markers.

Catalog#	Product Name	Species	# of Genes	# of Plates
PAM-HF96	Human inflammatory miRNA qPCR arrays	Human	84	1
PAM-HH96	Human heart disease miRNA qPCR arrays	Human	84	1
PAM-HI96	Human immunopathology miRNA qPCR arrays	Human	84	1
PAM-HK96	Human iPS cells miRNA qPCR arrays	Human	168	2
PAM-HM96	Human muscle disease miRNA qPCR arrays	Human	84	1
PAM-HT96	Human toxicology related miRNA qPCR arrays	Human	84	1
PAM-HX96	Human serum and plasma miRNA qPCR arrays	Human	168	2
PAM-MF96	Mouse inflammatory miRNA qPCR arrays	Mouse	84	1
PAM-MH96	Mouse heart disease miRNA qPCR arrays	Mouse	84	1
PAM-MI96	Mouse immunopathology miRNA qPCR arrays	Mouse	84	1
PAM-MX96	Mouse serum and plasma miRNA qPCR arrays	Mouse	84	1

miProfile™ miRNome qPCR Arrays

The miProfile™ Human miRNome qPCR Arrays are a set of twenty-one 96-well plates covering 1,700 of the best characterized and annotated miRNAs based on miRBase v18. Arrays are also available for mouse covering 834 annotated miRNAs.

The miProfile™ Human Single-Nucleotide Mismatch miRNA qPCR Arrays are available as stand-alone products for users who want to study these miRNAs using specific PCR conditions.

Catalog#	Product Name	# of miRNAs	# of Plates
PAM-HG96	Human miRNome miRNA qPCR arrays	1,700 (miRBase v18)	21 x 96-well
PAM-HS96	Human single-nucleotide mismatch miRNA qPCR arrays	61	1 x 96-well
PAM-HG384	Human miRNome miRNA qPCR arrays	1,700 (miRBase v18)	5 x 384-well
PAM-MG96	Mouse miRNome miRNA qPCR arrays	834 (miRBase v18)	10 x 96-well
PAM-MG384	Mouse miRNome miRNA qPCR arrays	834 (miRBase v18)	3 x 384-well

miProfile™ miRNA qPCR Array Custom Services

GeneCopoeia can also make custom miRNA qPCR arrays for the miRNAs of your interest. Simply provide us with a list of miRNAs and your instrument model, and we will help you to build custom qPCR arrays for your specific instrument type.

miRNA qRT-PCR Reagent Kits and Validated Primers

RNAzol® RT RNA Isolation Reagent

RNAzol® RT RNA Isolation Kit is the most effective reagent for isolation of total RNA and small RNA from human, animal, plant, bacterial and viral origin.
(Catalog#: E01010A)

All-in-One™ qPCR Mix

The All-in-One™ qPCR Mix uses high-fidelity hot-start polymerase, an optimized reaction buffer and high-quality dNTPs to enable specific and sensitive amplification from even low-copy RNA (cDNA) or DNA samples.
(Catalog#: AOPR-0200, AOPR-0600, AOPR-1000, AOPR-4000)

All-in-One™ miRNA First-Strand cDNA Synthesis Kit

The All-in-One™ First-Strand cDNA Synthesis Kit is optimized to work with miProfile™ miRNA qPCR arrays to generate reliable end results.
(Catalog#: AMRT-0020, AMRT-0060)

All-in-One™ miRNA qRT-PCR Detection Kit

The All-in-One™ RT-PCR Detection Kit includes both RT and PCR reagents. It combines PCR technology and SYBR® Green-based detection to make fast and accurate quantification of mature miRNAs from as little as 10 pg of small RNA or 20 pg of total RNA samples. The kit is designed for All-in-One™ miRNA qPCR validated primers.
(Catalog#: AOMD-Q020, AOMD-Q060)

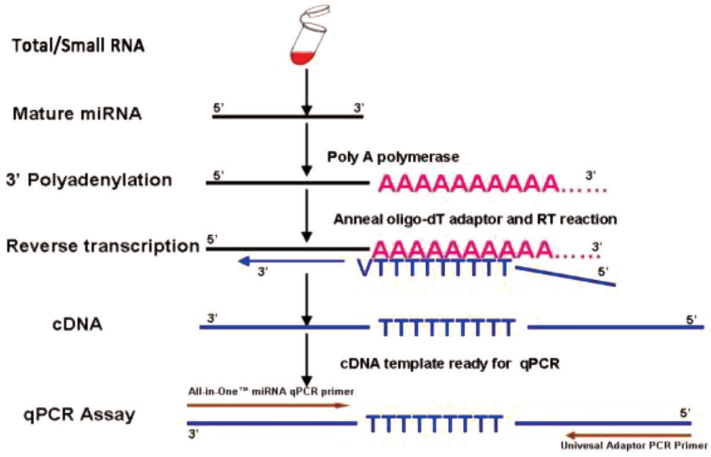


Figure 9. Overview of steps involved in the All-in-One™ miRNA qRT-PCR Detection Kit. After 3' polyadenylation, M-MLV RTase in conjuction with a unique oligo dT adaptor primer reverse transcribes the poly A miRNAs. The qRT-PCR mix containing SYBR® Green specifically detects the reverse transcribed miRNAs.

All-in-One™ miRNA qPCR Validated Primers

The All-in-One™ qPCR miRNA-specific primers are designed using a proprietary algorithm and experimentally validated. When used in combination with the All-in-One™ miRNA qRT-PCR Reagent Kits, the All-in-One™ miRNA primers generate reliable and reproducible high performance in quantitative PCR assays.

Custom Gene and miRNA qPCR Array Services

GeneCopoeia can also make custom gene qPCR arrays or custom miRNA qPCR arrays based on your own choice of genes or miRNAs. 96-well and 384-well formats are available for your specific instrument type. Different layouts are available for each format based on the number of genes or miRNAs you are interested in. Positive PCR controls and spike-in reverse transcription controls are required in custom arrays for QC purpose to ensure the RT and PCR reaction efficiency.

Custom Array Layouts

1 sample × 96 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	8	16	24	32	40	48	56	64	72	80	88
B	1	9	17	25	33	41	49	57	65	73	81	89
C	2	10	18	26	34	42	50	58	66	74	82	90
D	3	11	19	27	35	43	51	59	67	75	83	91
E	4	12	20	28	36	44	52	60	68	76	84	92
F	5	13	21	29	37	45	53	61	69	77	85	93
G	6	14	22	30	38	46	54	62	70	78	86	RT
H	7	15	23	31	39	47	55	63	71	79	87	PCR

2 samples × 48 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	8	16	24	32	40	GDC	8	16	24	32	40
B	1	9	17	25	33	41	1	9	17	25	33	41
C	2	10	18	26	34	42	2	10	18	26	34	42
D	3	11	19	27	35	43	3	11	19	27	35	43
E	4	12	20	28	36	44	4	12	20	28	36	44
F	5	13	21	29	37	45	5	13	21	29	37	45
G	6	14	22	30	38	RT	6	14	22	30	38	RT
H	7	15	23	31	39	PCR	7	15	23	31	39	PCR

3 samples × 32 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	8	16	24	GDC	8	16	24	GDC	8	16	24
B	1	9	17	25	1	9	17	25	1	9	17	25
C	2	10	18	26	2	10	18	26	2	10	18	26
D	3	11	19	27	3	11	19	27	3	11	19	27
E	4	12	20	28	4	12	20	28	4	12	20	28
F	5	13	21	29	5	13	21	29	5	13	21	29
G	6	14	22	RT	6	14	22	RT	6	14	22	RT
H	7	15	23	PCR	7	15	23	PCR	7	15	23	PCR

4 samples × 24 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	8	16	GDC	8	16	GDC	8	16	GDC	8	16
B	1	9	17	1	9	17	1	9	17	1	9	17
C	2	10	18	2	10	18	2	10	18	2	10	18
D	3	11	19	3	11	19	3	11	19	3	11	19
E	4	12	20	4	12	20	4	12	20	4	12	20
F	5	13	21	5	13	21	5	13	21	5	13	21
G	6	14	RT	6	14	RT	6	14	RT	6	14	RT
H	7	15	PCR	7	15	PCR	7	15	PCR	7	15	PCR

6 samples × 16 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	8	GDC	8	GDC	8	GDC	8	GDC	8	GDC	8
B	1	9	1	9	1	9	1	9	1	9	1	9
C	2	10	2	10	2	10	2	10	2	10	2	10
D	3	11	3	11	3	11	3	11	3	11	3	11
E	4	12	4	12	4	12	4	12	4	12	4	12
F	5	13	5	13	5	13	5	13	5	13	5	13
G	6	RT	6	RT	6	RT	6	RT	6	RT	6	RT
H	7	PCR	7	PCR	7	PCR	7	PCR	7	PCR	7	PCR

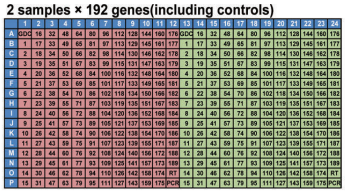
8 samples × 12 genes(including controls)

	1	2	3	4	5	6	7	8	9	10	11	12
A	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
B	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
C	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
D	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
E	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
F	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
G	GDC	1	2	3	4	5	6	7	8	9	RT	PCR
H	GDC	1	2	3	4	5	6	7	8	9	RT	PCR

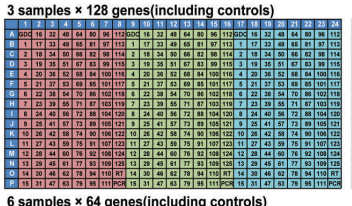
96-Well Plate

1 sample × 384 genes(including controls)

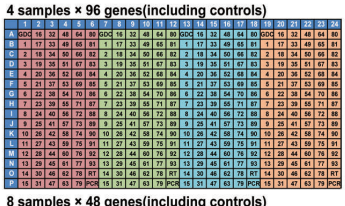
2 samples × 192 genes(including controls)



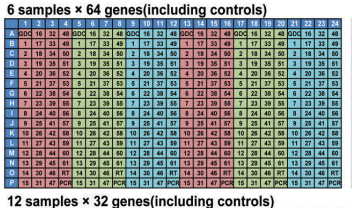
3 samples × 128 genes(including controls)



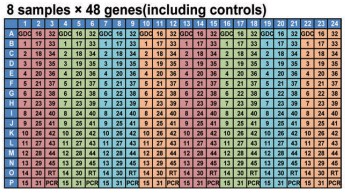
4 samples × 96 genes(including controls)



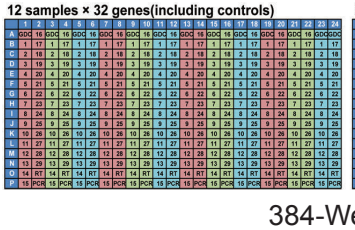
6 samples × 64 genes(including controls)



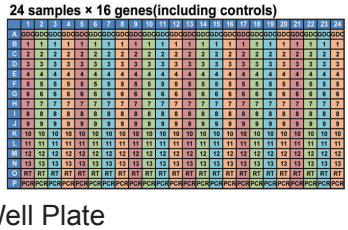
8 samples × 48 genes(including controls)



12 samples × 32 genes(including controls)



24 samples × 16 genes(including controls)



384-Well Plate

How to Order Custom qPCR Arrays

1. Provide your own gene list (gene symbol and accession number) or miRNA list
2. Choose array layout, housekeeping genes, and control genes
3. Determine the number and type of plates
4. Summit your custom array request form and contact GeneCopoeia technical support at 866-360-9531 or inquiry@genecopoeia.com for a quote

Custom Array Processing and Data Analysis

Do not have a real-time PCR instrument?

1. Send your samples to GeneCopoeia (RNA, cell, tissue)
2. GeneCopoeia's experienced scientists will process the samples and run the qPCR array experiments
3. Thorough data analysis results will be emailed to you

qPCR Array Data Analysis Tool

The qPCR array data analysis tool performs ΔΔCt based fold change calculations from your uploaded raw threshold cycle data to the excel data analysis file. Results are automatically analyzed in multiple formats and annotated to your gene list.

AVG ΔC_t (Ct(GOI) - Ave Ct (HKG))		$2^{-\Delta C_t}$		Fold Difference	T-TEST	Fold Up- or Down-Regulation	Comments
Test Sample	Control Sample	Test Sample	Control Sample	Test Sample /Control Sample	p value	Test Sample /Control Sample	
1.12	1.35	4.6E-01	3.9E-01	1.18	0.184963	1.18	OKAY
8.65	9.34	2.5E-03	1.5E-03	1.62	0.035272	1.62	OKAY
4.41	6.77	4.7E-02	9.2E-03	5.14	0.000004	5.14	Type 1
8.20	8.02	3.4E-03	3.9E-03	0.88	0.394106	-1.14	Type 2
0.70	2.01	6.2E-01	2.5E-01	2.48	0.000000	2.48	OKAY
4.74	5.74	3.7E-02	1.9E-02	2.00	0.000600	2.00	Type 1
4.31	3.97	5.0E-02	6.4E-02	0.79	0.146488	-1.26	OKAY
5.77	9.35	1.8E-02	1.5E-03	12.03	0.000059	12.03	Type 1
4.82	7.54	3.5E-02	5.4E-03	6.58	0.000040	6.58	Type 1
2.62	7.55	1.6E-01	5.3E-03	30.45	0.000011	30.45	Type 1
9.95	9.77	1.0E-03	1.1E-03	0.88	0.358349	-1.13	Type 2
0.94	2.05	5.2E-01	2.4E-01	2.16	0.000056	2.16	OKAY
3.77	6.05	7.4E-02	1.5E-02	4.87	0.000253	4.87	Type 1
5.31	1.32	2.5E-02	4.0E-01	0.06	0.052092	-15.91	OKAY

Fold Change

The fold change is calculated using the normalized gene expression (2^(- ΔCt)) of the test sample divided by the normalized gene expression (2^(- ΔCt)) of the control sample.

Fold Up- or Down-Regulation

If the fold change = 1, it means there is no up- or down-regulation.
If the fold change > 1, it indicates up-regulation.
If the fold change < 1, it indicates down-regulation.

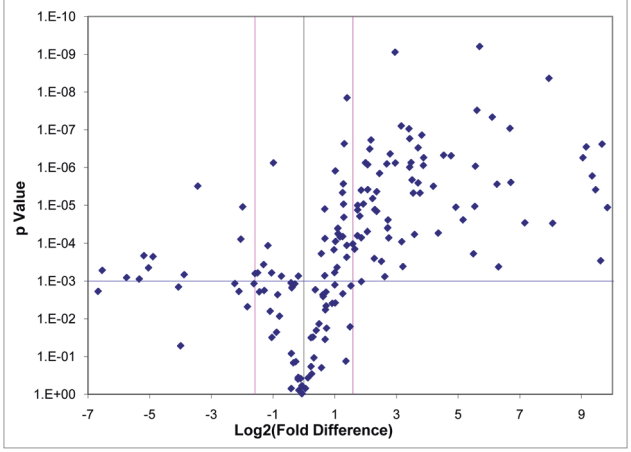


Figure 10. Volcano Plot -the black line indicates a fold change in gene expression of 1. The pink lines indicate the desired fold change in gene expression threshold as defined by the user.

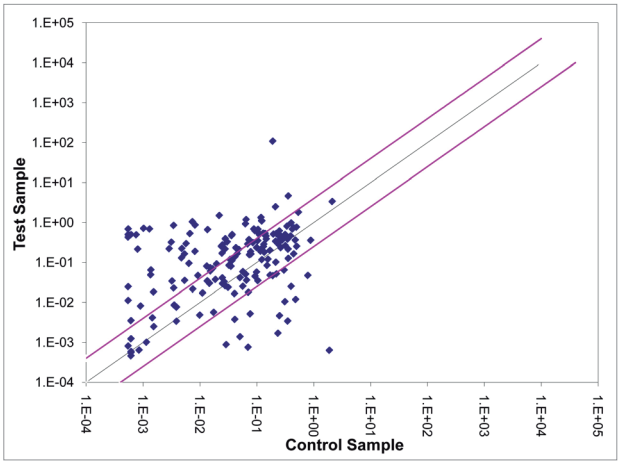


Figure 11. Scatter Plot -the black line indicates fold changes ((2 ^ (-ΔCt)) of 1. The pink lines indicate the desired fold change in gene expression threshold defined by the user.

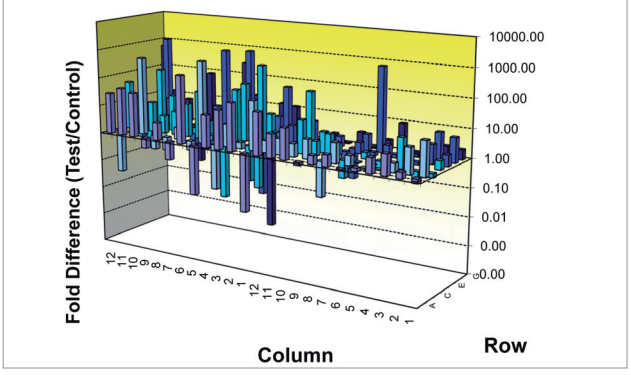


Figure 12. A 3-D profile showing up- and down-regulation results.

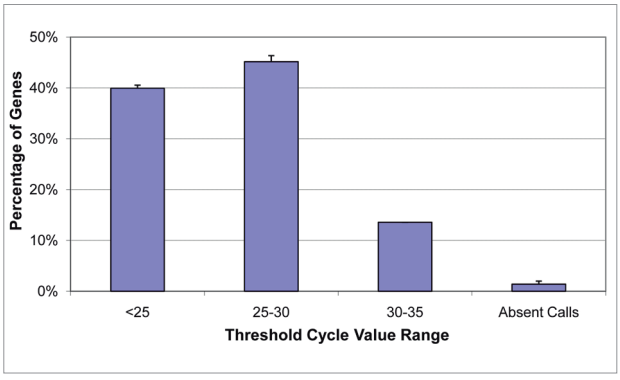
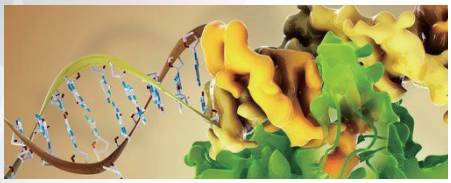


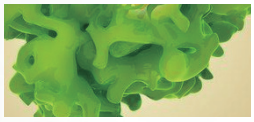
Figure 13. The percentage of genes that generate a certain Ct value. If Ct > 35, the gene is considered absent.

GeneCopoeia™
Expressway to Discovery

Mammalian Stable Cell Line Development Services

We now offer state-of-the art services for establishing stable cell lines that meet your specific research needs.





Stable cell lines with ORF clones

- Cell-based functional assays
- Protein production for biochemical assays
- Protein production for crystal or NMR structural determination
- Fusion tagging for pulldown/immunoprecipitation
- Fusion tagging for live cell imaging
- Monoclonal antibody production
- Drug target analysis

Applications

Stable cell lines expressing shRNAs

- Expression profiling to identify candidate downstream genes in a network or pathway
- Determination of gene function in cells
- Drug target validation

Applications

Stable cell lines constructed with CRISPR or TALEN

- Gene knockout
- Introduction of point mutations or defined insertions/deletions
- Correction of disease mutations back to wild type
- Gene tagging
- Replacing promoter or gene sequence
- Transgene knockin at human and mouse safe harbor sites or at a customer-specified locus

Applications

Mammalian Stable Cell Line Services

Advantages	Stable cell lines		
	ORF	shRNA	Genome editing
State-of-the-art facility for stable cell line development and QC following industrial standards.	√	√	√
Largest in-house collection of sequence-verified and expression-ready ORF, shRNA clones and lentiviral particles reduces turnaround time and ensures the highest quality.	√	√	N/A
Large selection of promoters including inducible promoters for toxic gene expression.	√	√	N/A
Large selection of different cell based assays for kinases, GPCR, ion channel, growth factor, and other protein-protein or protein-compound reactions.	√	√	N/A
Large selection of vectors with different fusion tags such as Flag®, HA, V5, His, and GFP to meet your needs.	√	N/A	N/A
DHFR or GS gene amplification stable cell lines for protein production and process development of Fed-batch cell culture.	√	N/A	N/A
MAR option for increased open-chromatin site integration.	√	N/A	N/A
≥ 70% knockdown efficiency in shRNA applications.	N/A	√	N/A
Complete solutions for CRISPR- or TALEN-based targeted genomic modifications.	N/A	N/A	√

We also provide **premade labeled cancer cell lines** either GFP labeled or dual labeled (luciferase + GFP). Contact us for more details!

GeneCopoeia, Inc.
9620 Medical Center Drive, Suite 101
Rockville, MD 20850, USA

Website: www.genecopoeia.com

For **more information**, or to **request a quote** for services, contact us at

inquiry@genecopoeia.com

or **1-866-360-9531 (toll free)**

STA1-091514

GeneCopoeia™ Expressway to Discovery

Histology/IHC Reagents

GeneCopoeia™
Expressway to Discovery

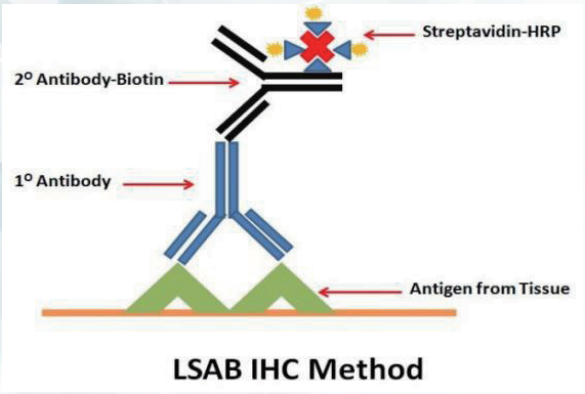
GeneCopoeia now offers kits and reagents for immunohistochemistry (IHC) dection and histology staining that meet your specific research needs.

VitroView™ LSAB Immunohistochemistry (IHC) Detection Systems

VitroView™ LSAB IHC Kits are based on a labeled streptavidin-biotin (LSAB) method. This method utilizes a biotinylated secondary antibody that links primary antibodies to a streptavidin-peroxidase conjugate. In this method, a single primary antibody is subsequently associated with multiple biotin molecules. Therefore, an increase in sensitivity is achieved compared with direct peroxidase-conjugate methods.

Advantages:

1) High sensitivity
2) Low background
3) Ready-to-use
4) High reproducibility
5) Budget-friendly



LSAB IHC Method

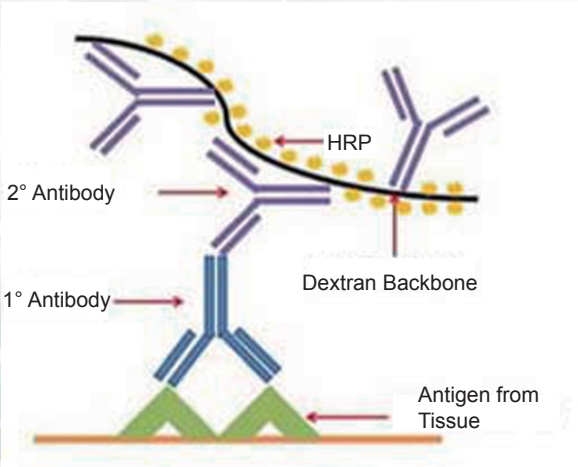
Product	Catalog#	Quantity	Application
LSAB IHC Kit (Mouse IgG)	VB-6015	150 tests	IHC for detecting a primary antibody made from mouse
LSAB IHC/DAB Kit (Mouse IgG)	VB-6015D	150 tests	IHC for detecting a primary antibody made from rabbit
LSAB IHC Kit (Rabbit IgG)	VB-6017	150 tests	IHC for detecting a primary antibody made from rabbit
LSAB IHC/DAB Kit (Rabbit IgG)	VB-6017D	150 tests	IHC for detecting a primary antibody made from rabbit
LSAB IHC Kit (Rat IgG)	VB-6019	150 tests	IHC for detecting a primary antibody made from rat
LSAB IHC/DAB Kit (Rat IgG)	VB-6019D	150 tests	IHC for detecting a primary antibody made from rat
LSAB IHC Kit (Goat IgG)	VB-6021	150 tests	IHC for detecting a primary antibody made from goat
LSAB IHC/DAB Kit (Goat IgG)	VB-6021D	150 tests	IHC for detecting a primary antibody made from goat

VitroView™ Polymer Based 1-Step Immunohistochemistry (IHC) Detection Systems

Polymerizing enzymes and attaching these polymers to antibodies is a recently-developed technology. This technology has been used for both primary antibodies and detection systems. The VitroView™ Polymer Based 1- step IHC Kit utilizes a novel polymerization technology to prepare polymeric HRP-linker antibody conjugates.

Advantages:

1) Biotin-free
2) High sensitivity
3) Low background
4) Simple and fast
5) Ready-to-use
6) Simplified multiple labeling

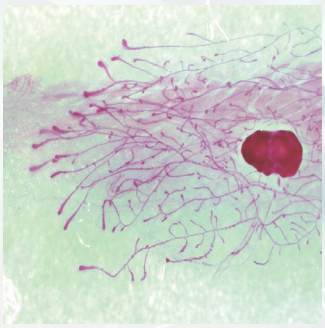
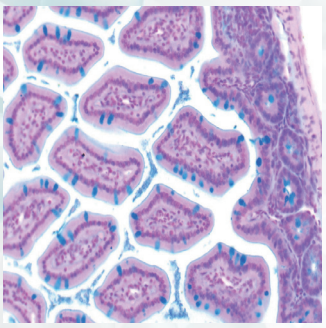
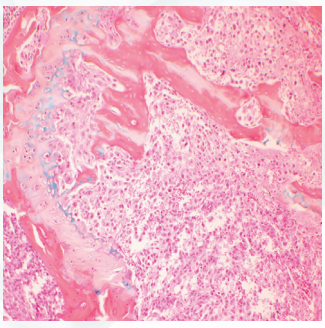
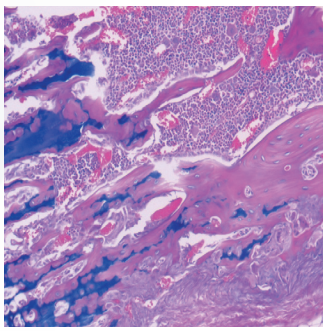


Product	Catalog#	Quantity	Applications
Universal 1-step Polymer-Based IHC kit (Anti-Mouse/Rabbit Ig)	VB-6023s	50 tests	IHC for detecting a primary antibody made from mouse or Rabbit
	VB-6023	100 tests	
Universal 1-step Polymer-Based IHC/DAB kit (Anti-Mouse/Rabbit Ig)	VB-6023D	100 tests	
1-Step Anti-Mouse Polymer-Based IHC kit	VB-6024s	50 tests	IHC for detecting a primary antibody made from mouse
	VB-6024	100 tests	
1-Step Anti-Mouse Polymer-Based IHC/DAB kit	VB-6024D	100 tests	
1-Step Anti-Rabbit Polymer-Based IHC kit	VB-6025s	50 tests	IHC for detecting a primary antibody made from rabbit
	VB-6025	100 tests	
1-Step Anti-Rabbit Polymer-Based IHC/DAB kit	VB-6025D	100 tests	
1-Step Anti-Goat Polymer-Based IHC kit	VB-6026s	50 tests	IHC for detecting a primary antibody made from goat
	VB-6026	100 tests	
1-Step Anti-Goat Polymer-Based IHC/DAB kit	VB-6026D	100 tests	
1-Step Anti-Rat Polymer-Based IHC kit	VB-6027s	50 tests	IHC for detecting a primary antibody made from rat
	VB-6027	100 tests	
1-Step Anti-Rat Polymer-Based IHC/DAB kit	VB-6027D	100 tests	

Histology/IHC Reagents

VitroView™ Routine and Special Histology Stain Kits

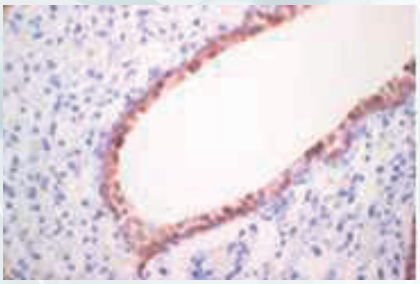
Product Name	Cat#	Applications
H&E Stain Kit	VB-3000	General purpose tissue stain
Mammary Gland Whole Mount Stain Kit	VB-3001	Mouse mammary gland whole mount stain
Alcian Blue Hematoxylin/Orange G Stain Kit	VB-3002	Bone and cartilage stain
Alcian Blue Stain Kit	VB-3003	Mucosubstances stain
PAS Stain Kit	VB-3004	Detection of glycogen in tissues
Alcian Blue - PAS Stain Kit	VB-3005	Tissue proteoglycan stain
Luxol Fast Blue Stain Kit	VB-3006	Identifying the basic neuronal structure in brain or spinal cord tissue
Oil Red O Stain Kit	VB-3007	Fat and lipid stain
Alizarin Red Stain Kit	VB-3008	Tissue calcium stain
Prussian Blue Stain Kit	VB-3009	Tissue Iron stain
Nissl Stain Kit	VB-3010	Neuron Nissl body stain
Congo Red Amyloid Stain Kit	VB-3011	Tissue amyloid stain
Sudan Black B Lipid Stain Kit	VB-3012	Fat and lipid stain
Toluidine Blue Stain Kit	VB-3013	Mast cell stain
Modified Gomori's Trichrome Stain Kit	VB-3014	Differentiate collagen and muscle in tumors
Bielschowsky's Silver Stain Kit	VB-3015	Detection of neurites and neurofibrillary tangles

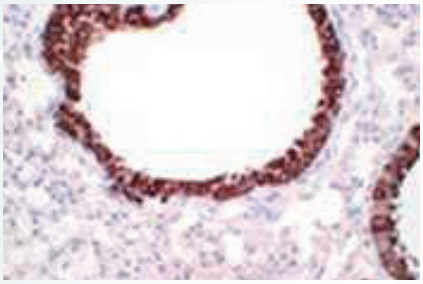
Histology/IHC Reagents

Related Reagents/Kits for IHC

Product	Catalog#	Quantity	Applications
Citrate Buffer (10x)	VB-6030	250 ml	IHC Antigen Retrieval
Citrate Buffer (1x)	VB-6031	1 Liter	IHC Antigen Retrieval
EDTA Antigen Retrieval Buffer (10x)	VB-6032	250ml	IHC Antigen Retrieval
EDTA Antigen Retrieval Buffer (1x)	VB-6033	1 Liter	IHC Antigen Retrieval
Proteinase K Antigen Retrieval Kit	VB-6034s	200 Tests	IHC Antigen Retrieval
	VB-6034	2000 Tests	
Antibody Dilution Buffer	VB-6002	100ml	IHC Antibody dilution
DAB Substrate Kit	VB-6003	1000 Tests	Substrate for use in IHC
Enhanced DAB Substrate Kit	VB-6003E	1000 Tests	Substrate for use in IHC
IHC Hematoxylin Counterstain Kit	VB-6004	300 Tests	IHC counterstain



CC10 IHC/DAB



CC10 IHC/Enhanced DAB

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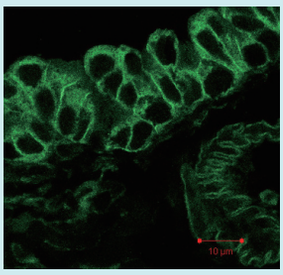
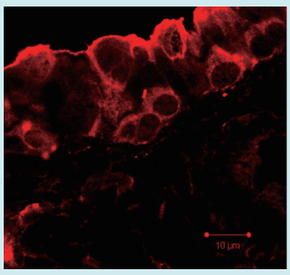
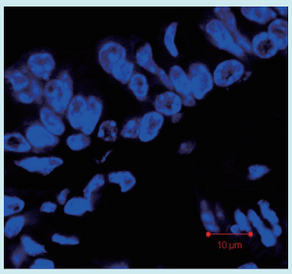
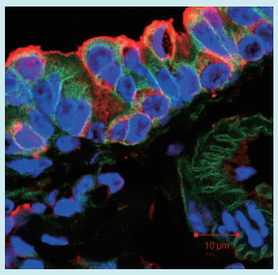
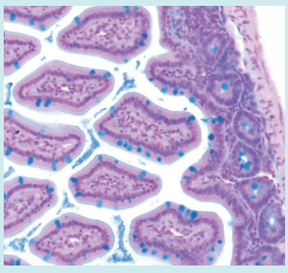
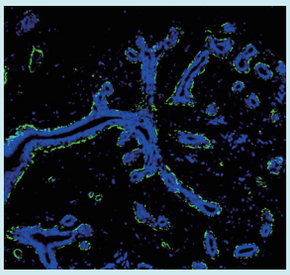
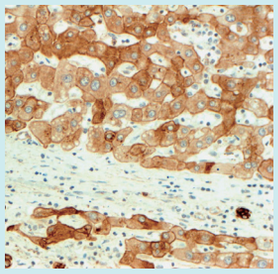
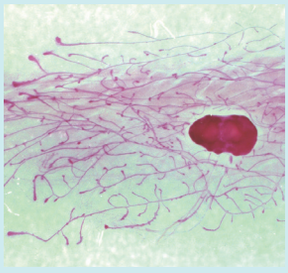
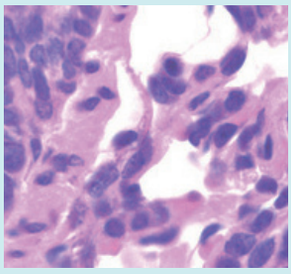
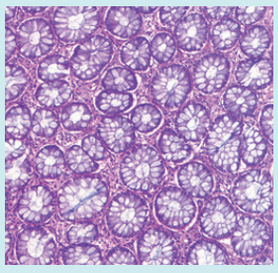
Double IF Staining *(all four)*

Alcian Blue Stain *(left)*
Smooth Muscle Actin IF *(middle)*
Pan-keratin IHC/DAB *(right)*

Whole Mount Staining *(left)*
H&E Stain *(middle and right)*

VitroView™ Histology Services

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Routine histology	• Whole histological preparation of mammalian species • Paraffin processing • Serial sections • H&E stain
Specialized histology	• RNAse cutting precaution • Decalcified bone techniques • Special stain
Paraffin-embedding/Sectioning for culture cells	
Cryotomy (frozen sections)	
Immunohistochemistry	
Immunofluorescent (IF) stain (Single or double antibody staining)	
***In situ* apoptosis (TUNNEL) assay**	
***In Situ* BrdU cell proliferation assay**	
Formalin-fixed, paraffin-embedded (FFPE) tissue analysis services	• PCR from FFPE tissue/slides • RT-PCR from FFPE tissue/slides • Western blot from FFPE tissue/slides • DNA isolation from FFPE tissue samples • RNA isolation from FFPE tissue samples • Protein extraction from FFPE tissue samples
Mouse genotyping services	• Multiple sample types are accepted, including tails, ears or formalin-fixed, paraffin-embedded (FFPE) tissues.

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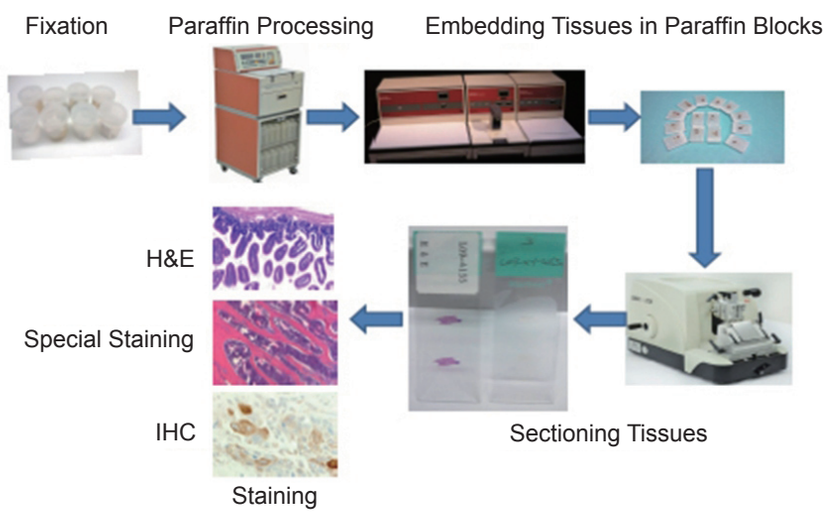
Toll free	+1 (866) 360-9531
Fax	+1 (301) 762-3888
Website	www.genecopoeia.com



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IRES Expression Clones

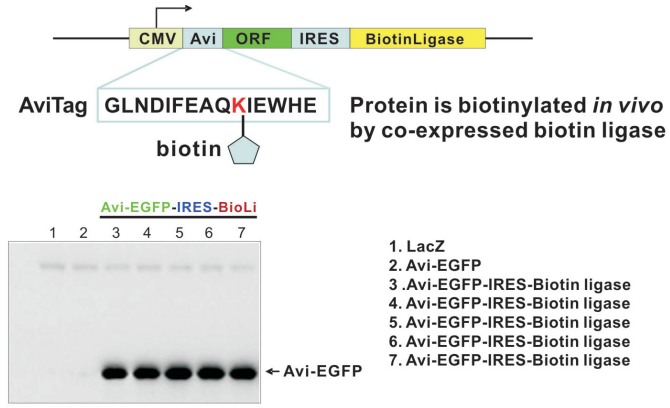

Figure 3. Specific biotinylation of AviTag-eGFP by *E. coli* biotin ligase in 293 cells. Biotin ligase and Avi-eGFP are expressed from the same CMV promoter via the IRES technology.

Promoter	Cell type	Fusion tag
CMV	Mammalian	C-3xHA+IRES-eGFP C-Flag+IRES-eGFP C-His+IRES-eGFP C-Myc+IRES-eGFP IRES2-eGFP N-Avi+IRES-Biotin ligase C-Avi+IRES-Biotin ligase
CMV (lenti vector)	difficult-to- transfect mammalian	IRES-eGFP IRES-eYFP IRES-eCFP IRES-mCherry IRES-luciferase C-Myc+IRES-eGFP C-Myc+IRES-eYFP C-Myc+IRES-eCFP C-Myc+IRES-mCherry C-Myc+IRES-luciferase C-3xHA+IRES-eGFP C-Flag+IRES-eGFP N-Avi+IRES-Biotin ligase C-Avi+IRES-Biotin ligase IRES-Neomycin C-Myc+IRES-Neomycin
PGK (lenti vector)	difficult-to- transfect mammalian	IRES-eGFP C-Myc+IRES-eGFP

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GeneCopoeia™ Expressway to Discovery

HaloTag® Expression Clones

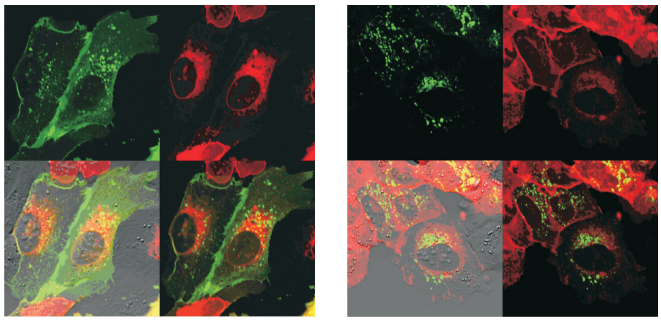
Overview

HaloTag® technology

The HaloTag is a multi-functional protein tag that binds covalently and specifically to a variety of synthetic HaloTag® ligands, which enables tagged proteins to be labeled with fluorophores for both *in vitro* and *in vivo* imaging or with affinity agents for purification.

OmicsLink™ HaloTag® ORF expression clones

Over 45,000 human and mouse ORF expression clones are available in mammalian and lentiviral vectors with either N- or C-terminal HaloTag®. They are expression-ready and fully sequence verified.



Time 0 Time 12 hours

Figure 1. Spatial and temporal separation of proteins using HaloTag® technology. Twelve hours after cell labeling, imaging showed the differentially labeled proteins as they moved from the cytoplasm to the membrane and as they internalized from the membrane. Detailed description of the experimental design and results can be found in Svendsen, S., et al., (Promega Notes 95 (2007) 16–19)

HaloTag® vector types

Promoter	Host cells	Tag	Protease site
CMV	Mammalian	N- or C-HaloTag®	Tev protease
CMV (lenti vector)	Difficult-to-transfect mammalian (primary, neurons, stem cells)	N- or C-HaloTag®	Tev protease
T7	Bacteria	N-HaloTag®	Tev protease

Advantages

Multi-functional tag

- In vivo and in vitro imaging
- Protein localization and co-localization
- Protein-DNA interaction
- Multiplex labeling for pulse-chase and translocation
- Protein enrichment and western blot analysis

Rapid and efficient detection

- Rapid and efficient coupling of synthetic reporter and affinity ligands

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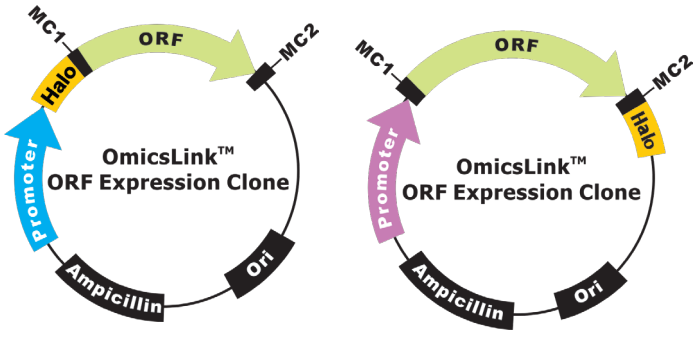

Figure 2. OmicsLink™ ORF cDNA expression clones with N- and C- HaloTag® in various expression vector systems.

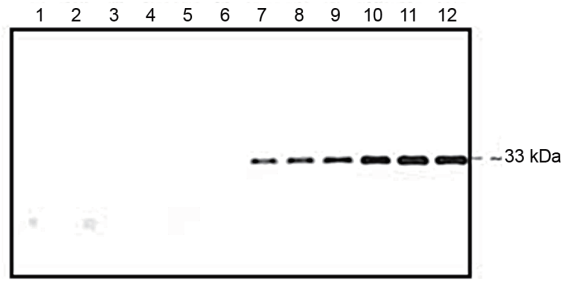

Figure 3. Fast, efficient and highly specific labeling of the HaloTag® proteins expressed in mammalian cells. CHO-K1 control cells (lanes 1–6) or cells transiently transfected with HaloTag® pHT2 expression clone (lanes 7–12) were labeled with 5 µM HaloTag® TMR Ligand for different periods of time at 37°C (0.5, 1, 2, 5, 15 and 30 minutes). Proteins were resolved by SDS-PAGE and analyzed on a Hitachi FMBIO® fluorescence scanner.

HaloTag® ligands and anti-HaloTag® antibody

Ligand	Excitation Maximum	Emission Maximum	Application
HaloTag® diAcFAM Ligand	494nm	526nm	Intracellular protein labeling
HaloTag® TMR Ligand	555nm	585nm	Intracellular protein labeling
HaloTag® CoumarinLigand	353nm	434nm	Intracellular protein labeling
Anti HaloTag® pAB	N/A	N/A	Labeling after fixing or protein enrichment

Please visit www.promega.com for more information on HaloTag® related products.

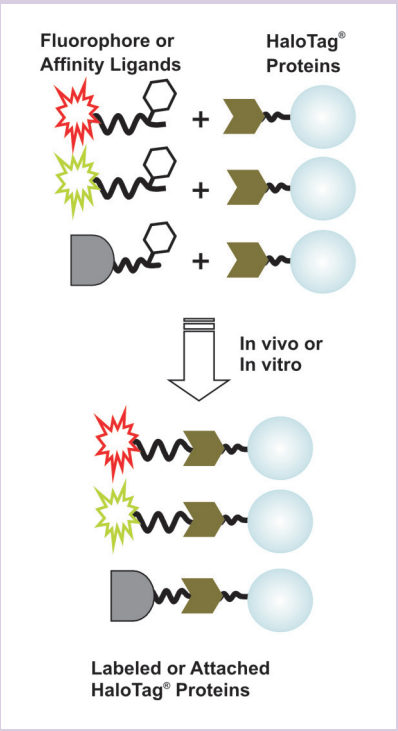

Figure 4. Diagram showing how HaloTag® works.

AviTag™ Expression Clones

Overview

AviTag™ technology

The AviTag system takes advantage of the strongest non-covalent interaction known in nature – that between biotin and avidin with a Kd = 10^{-15} M. The technology is based on the biotinylation of AviTag *in vitro* or *in vivo* and on the specific and reverse binding of avidin or streptavidin to biotin for immobilizing, purifying and visualizing proteins.

OmicsLink™ AviTag™ ORF expression clones

Over 45,000 expression-ready AviTagged human and mouse ORF clones are available in expression vectors with a choice of T7 or CMV promoters. They offer an easy solution for many applications, such as detection, isolation, imaging, localization and immoblization.

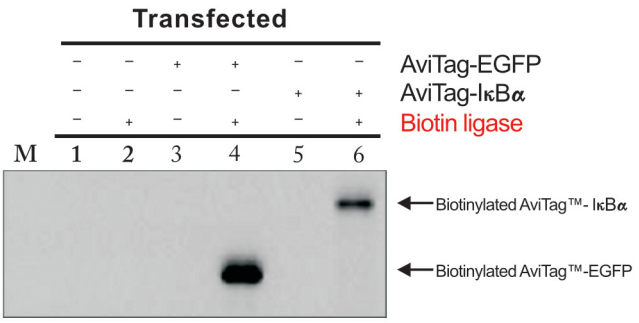

Figure 1. AviTag-eGFP or AviTag-IkBα expression plasmids were transfected into 293T cells alone or with co- transfected biotin ligase. Lysates were prepared 13 hours later. Extracts were prepared after transfection and resolved on a 12% SDS-PAGE gel. Biotinylated proteins were visualized on a western blot with streptavidin-HRP conjugate and chemiluminescent substrate.

Promoter	Host cells	Tag
CMV	Mammalian	N- or C-AviTag N- or C-Avi+IRES-Biotin ligase
CMV (lenti vector)	Difficult-to-transfect mammalian	N- or C-AviTag N- or C-Avi+IRES-Biotin ligase
T7	Cell free	N-AviSUMO N-HisAviSUMO N-HisSUMOAvi
T7	*E.Coli*	N-Avi

Advantages

Multi-functional tag

- Small-scale and high-throughput screening of protein-protein interactions
- Purification of AviTagged proteins using avidin
- Western blot, staining and sorting T cells with MHC-tetramers by visualizing AviTagged protein

Specific

- Biotinylation of the AviTag is highly specific. The chance for cross reaction is low when using biotinylation in protein purification

Sensitive

- Reproducible and reliable results for applications requiring high sensitivity, such as protein- protein interactions

AviTag™ Expression Clones

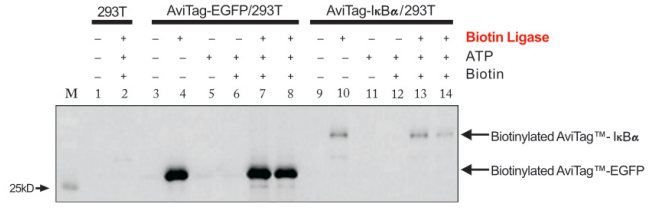

Figure 2. Extracts from 293T cells transfected with the AviTag-eGFP or AviTag-IkBα expression plasmid and untransfected controls were mixed with purified biotin ligase, biotin (50M) and ATP (10mM) as indicated in the figure. After incubation at 30°C (lanes 1-7, 9-13) or 4°C (lanes 8, 14) for 30 minutes, the mixtures were resolved by SDS-PAGE. Biotinylated proteins were visualized on a western blot with streptavidin-HRP conjugate and chemiluminescent substrate.

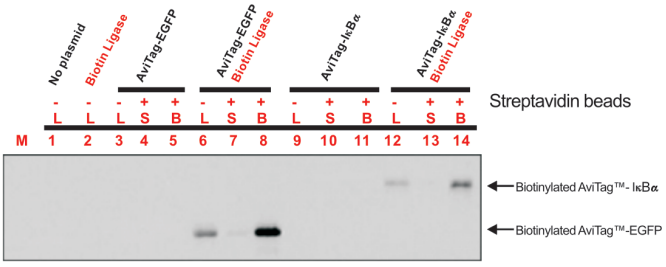

Figure 3. 293T cells were transfected with different combinations of AviTag expression plasmids and biotin ligase as indicated in the figure. Lysates were prepared 24 hours after transfection and incubated with streptavidin beads for 8 hours. Suspensions were centrifuged and pelleted beads were washed 3 times. Cell lysates (L), supernatants (S) and pelleted biotinylated protein bound to streptavidin beads (B) were resolved by SDS-PAGE. Biotinylated proteins were visualized on a western blot with streptavidin-HRP conjugate and chemiluminescent substrate.

Related products

Biotin protein ligase
Biotin solution
Positive controls
Anti-C-terminus AviTag antibody
Biotinylation strains

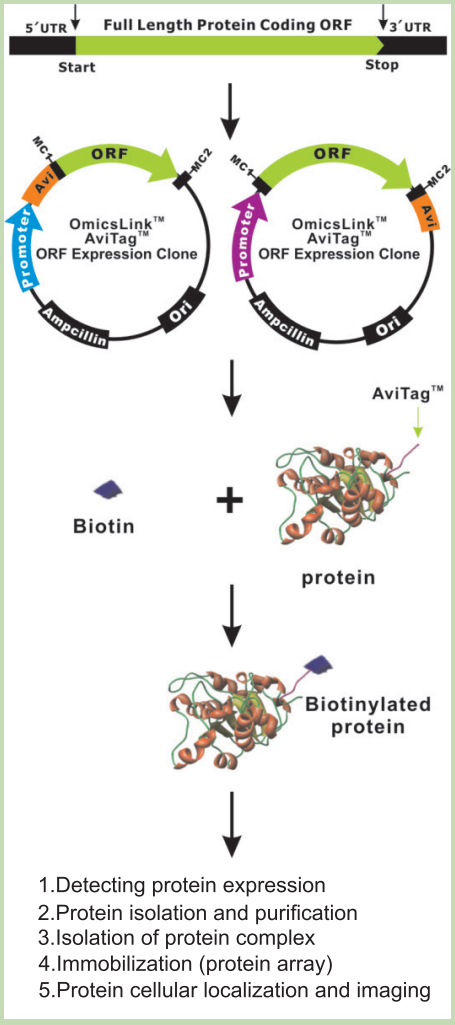

Figure 4. Diagram showing How AviTag works.

IRES Expression Clones

Overview

IRES technology

The Internal Ribosome Entry Site (IRES) technology allows coordinated and efficient co-expression of two genes using the same promoter in a single vector. Virtually any combination of genes is possible.

OmicsLink™ IRES ORF expression clones

More than 45,000 human and mouse ORF clones are now available in OmicsLink IRES expression vectors. These ORF expression clones contain various promoters, fusion tags, and other features which makes them suitable for expression studies and functional assays in a variety of transcription and translation systems.

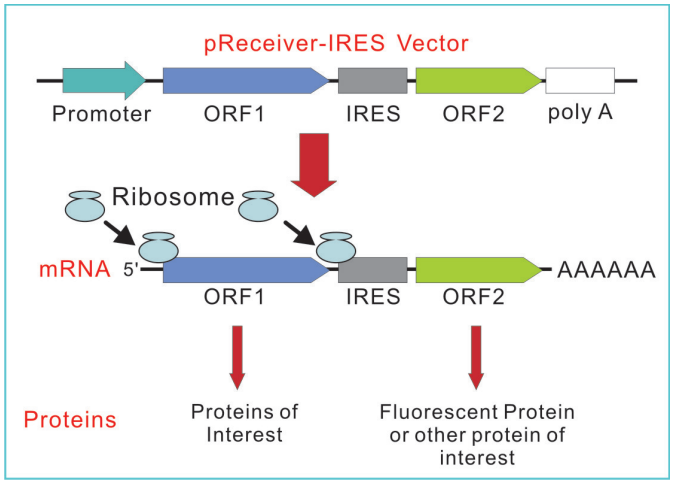

Figure 1. Diagram showing How IRES works.

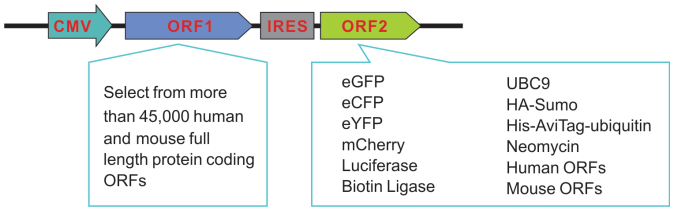

Figure 2. Vector choices for OmicsLink IRES ORF expression clones indicate wide selection of fusion tags, reporter genes, selection markers, etc. that can be co- expressed with the genes of interest.

Advantages

Multiple applications

- Monitor gene delivery efficiency by co-expression with reporter genes such as eGFP or luciferase
- Monitor protein modification by a specific modifier *in vivo* by co-expression with protein modifiers
- Allow *in vivo* biotinylation of AviTag™ fusion protein by co-expression with biotin ligase
- Allow more efficient selection and establishment of stably transfected cell lines by co-expression with selection marker genes

Minimal impact

- When reporter/assaying genes are co-expressed, the biological activities of the assaying proteins will be minimally affected

Eliminate co-transfection

- Eliminate concerns of co-transfection efficiency and other potential problems related to co-transfection of two expression plasmids

OmicsLink™ Anti-Tag Antibodies

Overview

GeneCopoeia OmicsLink™ Anti-Tag Antibodies are monoclonal mouse IgG antibodies that bind to 6xHis-, GFP-, mCherry-, GST-, D*-, HA-, or Myc-tagged fusion proteins. The antibodies can be used to identify and capture fusion proteins by western blots, immunostaining and immunoprecipitation. The immobilized antibodies can also be used for affinity purification of tagged fusion proteins. They are ideal for use with OmicsLink™ expression-ready ORF cDNA clones, which have a wide-range of fusion tag collections.

The OmicsLink anti-tag antibodies are produced by immunizing mice with specific synthetic peptides of the fusion tags. They recognize over-expressed recombinant proteins with the epitope tags fused to either the N- or C-terminal of the protein in transfected mammalian cells or other expression systems.

Catalog number	Product	Type
CGAB-DDK-0050 CGAB-DDK-0100	OmicsLink™ Anti-D* Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-GFP-0050 CGAB-GFP-0100	OmicsLink™ Anti-GFP Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-RFP-0050 CGAB-RFP-0100	OmicsLink™ Anti-mCherry Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-GST-0050 CGAB-GST-0100	OmicsLink™ Anti-GST Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-MYC-0050 CGAB-MYC-0100	OmicsLink™ Anti-MYC Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-HA-0050 CGAB-HA-0100	OmicsLink™ Anti-HA Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG
CGAB-HIS-0050 CGAB-HIS-0100	OmicsLink™ Anti-HIS Antibody (50 µg or 100 µg)	Monoclonal Mouse IgG

*D tag is also known as FLAG® tag.

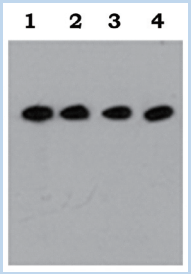

Figure 1. Western blot analysis using 293 cells transfected with D tag vectors. Lane1: highest concentration at 0.5 mg/ml Anti-D tag antibody. Lane 4: lowest concentration at 0.1 µg/ml.

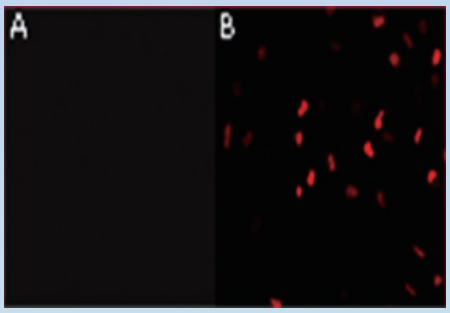

Figure 2. Immunofluorescence staining of HA-tag fusion protein in a stably expressing cell line (B) and a control cell line (A).

GeneCopoeia™
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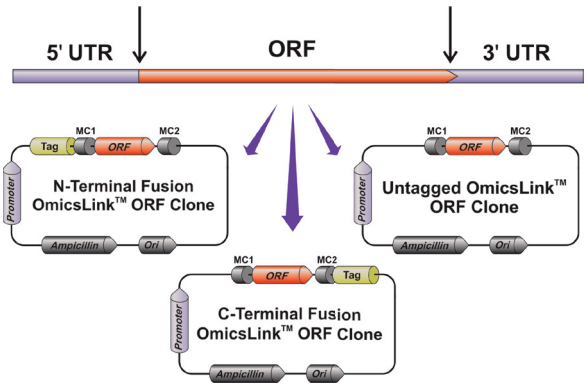
OmicsLink™ Anti-Tag Antibodies

Related products

OmicsLink™ expression-ready ORF cDNA clones



Expression system	Mammalian, bacterial, insect, lentiviral, yeast, wheat germ cell free
Promoter	CMV, T7, Tac, EF1α, GAL1, pADH, AcMNPV polyhedrin, custom promoter
Selection marker	Neomycin, puromycin, hygromycin, blasticidin, zeocin
Fusion tag	• Fluorescent tags:eGFP, eYFP, eCFP, mCherry • Multifunctional tags: HaloTag®, AviTag™ • Solubility and purification tags: 6xHis, SUMO, Flag, GST, MBP, 3xFlag • Antibody immunoprecipitation tags: 3xHA, Myc, Flag, 3xFlag • IRES- coexpressed tags: Avi+IRES-Biotin ligase, Myc+IRES-eGFP, IRES-eGFP, IRES-Neomycin,IRES-Luciferase, etc.
Vector type	Lentiviral and non-viral vectors

To order

Please visit www.genecopoeia.com or contact us directly.

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GeneCopoeia™ Expressway to Discovery

EndoFectin™ Transfection Reagents

Overview

Developed by GeneCopoeia for fast, efficient transfection of expression-ready constructs into a variety of cell lines, EndoFectin™ reagents offer researchers transfection solutions that are gentle on cells and optimized for specific cell types.

EndoFectin™ Plus – For a broad range of routinely used mammalian cells, including HEK293, CHO, COS, NIH/3T3 cells and more

EndoFectin™ CHO – For Chinese hamster ovary cells

EndoFectin™ Max – For adherent and suspension cell lines

EndoFectin™ Lenti – For co-transfection of lentiviral expression constructs and plasmids into packaging cells to deliver high titers for lentivirus transduction

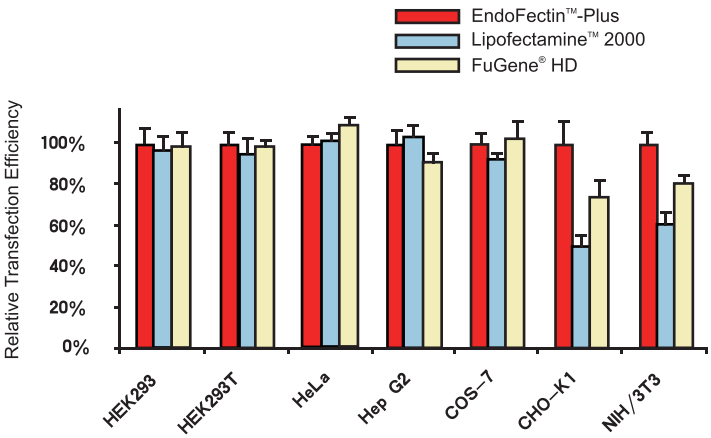

Figure 1. A EGFP-expressing plasmid was transfected into various cell lines using transfection reagents as indicated. Transfection efficiencies were assessed by measuring the percentage of EGFP-expressing cells which were normalized against those produced by EndoFectin Plus. Lipofectamine™ 2000 (LF 2000) is a trademark of Invitrogen; FuGENE® HD is a trademark of Roche.

Advantages

Efficient

High transfection efficiency and protein expression
Easy to use and time-saving
Extremely low cytotoxicity
More cost effective

Reproducible

Provide consistently high transfection efficiency

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EndoFectin™ Transfection Reagents

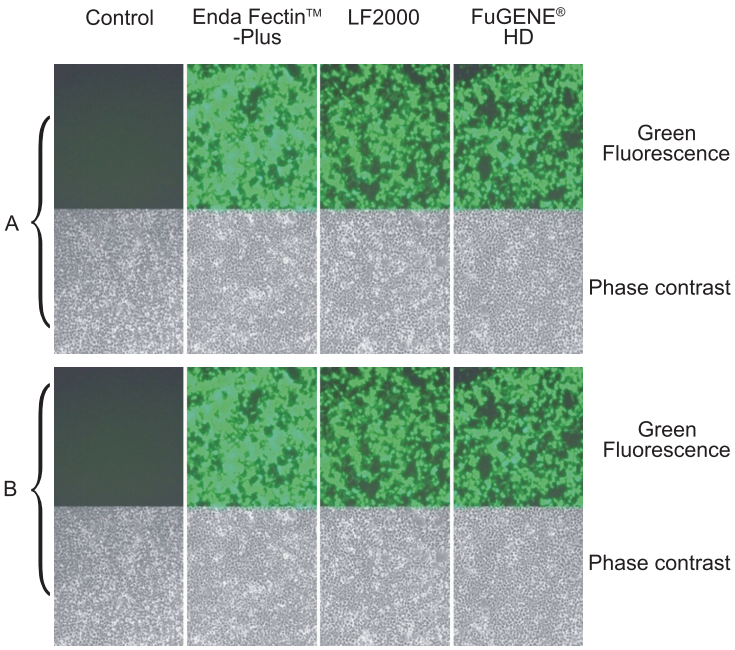

Figure 2. HEK293T cells were transfected with an EGFP-expressing plasmid using various transfection reagents as indicated. The cells were observed with inverted fluorescence microscope 20 hours after transfection. HEK293T cells were transfected either in serum-free medium (A) or in 10% serum (B). Lipofectamine™ 2000 (LF 2000) is a trademark of Invitrogen; FuGENE® HD is a trademark of Roche.

Catalog number	Product
EFL1001-01 EFL1001-02	EndoFectin™ Lenti (1 ml or 5 ml)
EFC1002-01 EFC1002-02	EndoFectin™ CHO (1 ml or 5 ml)
EFP1003-01 EFP1003-02	EndoFectin™ Plus (1 ml or 5 ml)
EFM1004-01 EFM1004-02	EndoFectin™ MAX (1 ml or 5 ml)

To order

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GeneCopoeia™ Expressway to Discovery

TF-Detect™ Human P53 Activity Assay Kit

Overview

TF-Detect™ Human p53 Activity Assay Kit enables fast and sensitive detection and quantification of p53 in a 96-well format. Double-stranded oligonucleotides containing a p53 consensus binding site are immobilized in a 96-well plate. The p53 proteins present in nuclear extracts are captured by the immobilized oligonucleotides specifically and then detected by a p53 antibody and a HRP-conjugated secondary antibody. The colorimetric signal generated by HRP substrate TMB can be easily quantified by spectrophotometry.

A purified recombinant human p53 protein is also provided in the kit for use as a protein standard to provide quantitative data for comparing p53 activities of different sample types and/or time points.

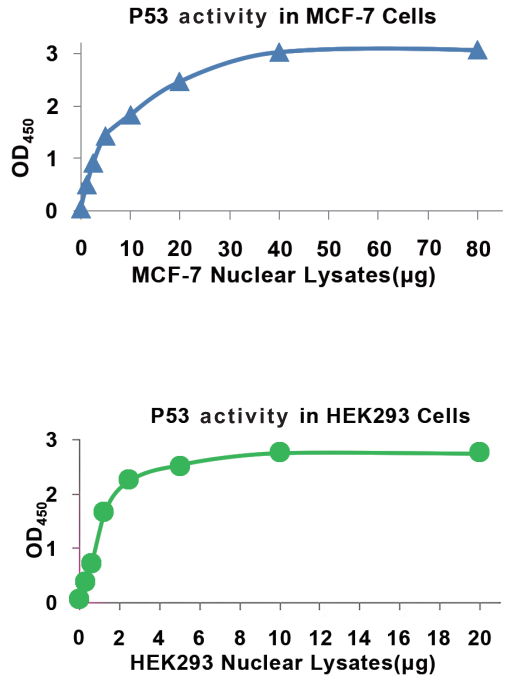

Figure 1. The activity of p53 proteins from the nuclear extracts of MCF-7 (Top) and HEK293 (Bottom) cells were detected using the TF-Detect p53 Activity Assay Kit. Both cell types were treated with 0.2mM H_2O_2 for 3 hours before harvesting. The cell nuclear extracts were prepared following the Preparation of Nuclear Extract protocol in the manual.

Advantages

Sensitive

Detects as little as 0.8 ng of human p53 protein

Quantitative

Purified recombinant human p53 protein included for use as a protein standard to provide quantitative comparison of p53 activities of different sample types and/or time points

HTS compatible

Optimized 96-well format for high throughput analysis on 96-well plate readers
Single strip (8-well) assay can also be performed

Fast

3 and 1/2 hours from preparation to detection

GeneCopoeia™
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TF-Detect™ Human P53 Activity Assay Kit

Protocol Overview

Rinse 96-well plate (coated with p53 binding oligoncleotides)

↓

Bind p53 (in nuclear extract or protein standard) to the immobilized oligonucleotides

↓ 1 hour

Wash 3X. Add p53 antibody

↓ 1 hour

Wash 3X. Add HRP-conjugated IgG antibody

↓ 1 hour

Wash 3X. Colorimetric reaction

Total < 3.5 hours

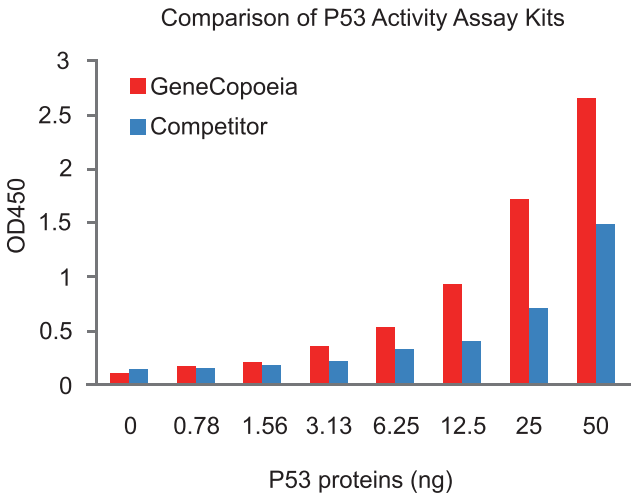

Figure 2. Performance comparison between GeneCopoeia's TF-Detect Human p53 Activity Assay kit and a similar competitor product. A human recombinant p53 protein was detected and quantified using both kits.

To order

TF-Detect™ Human P53 Activity Assay Kit
Cat. No. TAK-P53-196 (1 plate, 96 reactions)

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GeneCopoeia™ Expressway to Discovery

TF-Detect™ AP-1/c-Jun Activity Assay Kit

Overview

c-Jun, together with Fos and other Jun-related proteins, forms a homodimeric or heterodimeric transcription factor complex AP-1. TF-Detect™ AP-1/c-Jun Activity Assay kit enables fast and sensitive detection of Ser73-phosphorylated c-Jun in human, mouse or rat samples in a 96-well format. Double-stranded oligonucleotides containing the AP-1/c-Jun consensus binding site are immobilized in the 96-well plate. The c-Jun proteins present in nuclear extracts are captured by the immobilized oligonucleotides specifically. The Ser73-phosphorylated c-Jun is detected by a phosphor-c-Jun antibody and a HRP-conjugated secondary antibody. The colorimetric signal generated by HRP substrate TMB can be easily quantified by spectrophotometry. The Ser73 phospho-c-Jun antibody that detects Ser73-phosphorylated c-Jun also recognizes Ser100-phosphorylated JunD, as this site is conserved between c-Jun and JunD.

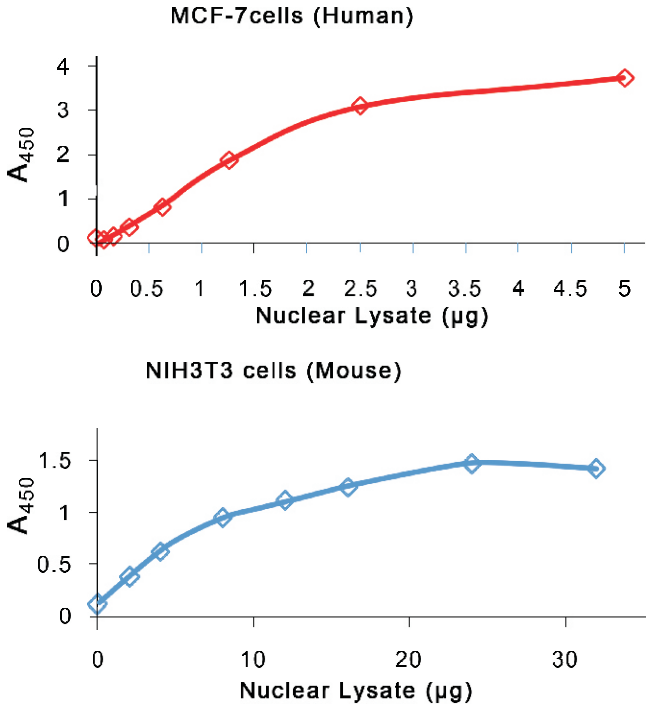

Figure 1. The activities of c-Jun proteins in the nuclear extracts of MCF-7 (top) and NIH3T3 (bottom) cells were detected using the TF-Detect AP-1/c-Jun Activity Assay Kit. Both cell types were treated with UV light for 20 Sec before harvesting.

Advantages

Multiple species

- Detects human, mouse or rat active c-Jun

Sensitive

- Detect Ser73-phosphorylated c-Jun in as low as 0.2 µg of nuclear lysate

HTS compatible

- Optimized 96-well format for high-throughput analysis on 96-well plate readers
- Single strip (8-well) assay can also be performed

Fast

- 3 and 1/2 hours from preparation to detection

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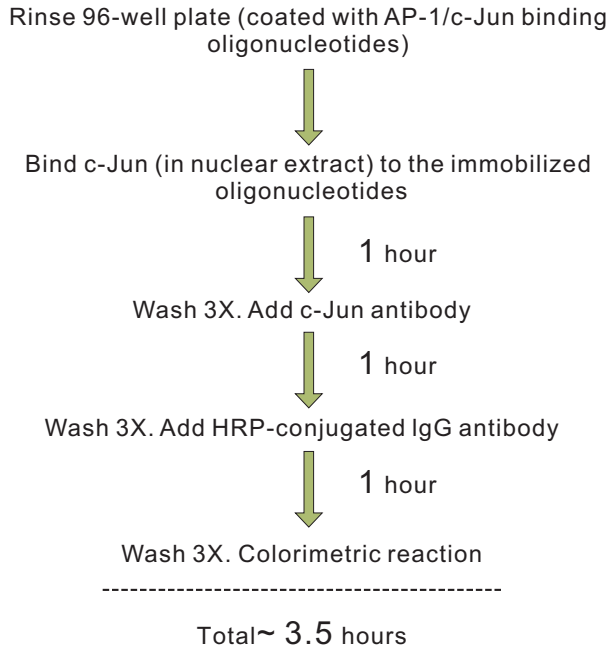
TF-Detect™ AP-1/c-Jun Activity Assay Kit

Protocol overview



Related Products

TF-Detect™ Human p53 Activity Assay kit
GLuc-ON™ Promoter Reporter Clones

To order

TF-Detect™ AP-1/c-Jun Activity Assay Kit
Cat. No. TAK-JUN-196 (1 plate, 96 reactions)

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GeneCopoeia™ Expressway to Discovery

MethylAffinity™ Methylated DNA Enrichment Kit

Overview

MethylAffinity™ Methylated DNA Enrichment Kit provides a GCM™-bead-based method for quick enrichment of methylated DNA fragments from whole genome. The enriched sample improves the performance of downstream analysis, such as RT-PCR, microarray and sequencing, for methylation status and location studies.

The genetically engineered GCM™ recombinant protein is designed based on the functional domain of methyl binding domain (MBD) proteins. It binds specifically to double-stranded DNA containing methylated CpG islands and has much higher affinity and specificity than any wild-type MBDs.

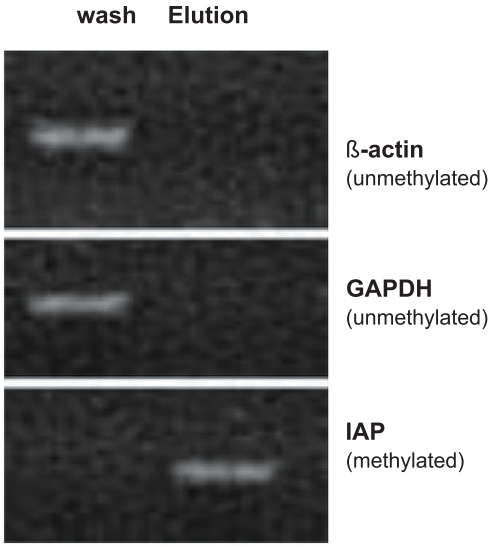

Figure 1. PCR results of enrichment controls
100 ng of mouse genomic DNA (sonicated) were added to 4 µl of GCM™-beads. After 1 hour binding reaction at RT, the beads were washed several times. Then the methylated DNA were eluted from the beads. The wash and elution supernatants (5% of each) were analyzed by PCR using primer sets specific for mouse ß-actin promoter (unmethylated), GAPDH promoter (unmethylated), and IAP repeats (methylated). The PCR products were checked by agarose gel electrophoresis.

Advantages

Sensitive and high affinity

- Enrich methylated DNA from nanograms of genomic DNA sample
- Isolate DNA fragments containing only a few copies of methylated CpG dinucleotides

Convenient gradient elution

- Salt gradient elution can be performed to fractionate DNA fragments based on methylated-CpG density

Fewer steps and less time

- Whole process takes < 2 hours
- Immobilized GCM beads are provided. No need to perform beads-protein coupling reaction
- Double-stranded methylated DNA fragments are captured, which simplifies sample preparation
- Rapid elution with salt

Easy to handle

- Vivid magenta color makes the beads easy to spot, thus greatly reduces the risk of incidental beads loss

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MethylAffinity™ Methylated DNA Enrichment Kit

Protocol Overview

Rinse and pellet GCM beads

↓

Bind methylated genomic DNA fragments to the GCM beads

↓ 1 hour

Pellet the beads. Wash 4X to remove non-methylated DNA

↓

Elute methylated DNA from the beads

Total< 2 hours

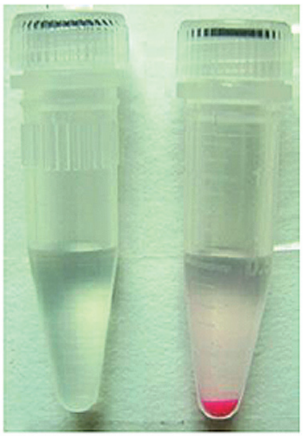

Figure 2. Easy to spot GCM™ beads Comparison of GCM™ magenta beads (right) with conventional Sepharose beads (left). The magenta color of the beads helps reduce accidental beads loss during the handling.

To order

MethylAffinity™ Methylated DNA Enrichment Kit
Cat. No. MAK-GCM-30 (30 Reactions)

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