



abm abm®
www.abmgood.com

Viral Expression Systems



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Lentiviral Expression Systems

Lentiviral Vectors and Viruses

The Lentivirus system offers:

- A wide variety of promoters including CMV, EF1 α , UbC, and PGK

abm's ready-to-use lentiviral vectors and prepackaged lentiviruses are available for every human, mouse, or rat gene.

Select promoters, tags, and reporters to match your project requirements. Our Custom Recombinant Lentivirus Service utilizes our proprietary pLenti-Combo 2nd and 3rd generation packaging mixes as well as streamlined protocols for rapid high titer production.

Choosing the right promoter for your host system:

Promoter	Applications
CMV	The most widely used promoter. Very strong gene expression promoter in most cellular systems ; weak activity in human and mouse stem cells.
EF1 α	Strong expression promoter ; highly efficient in stem cells. Good for stable expression from long term cultures.
PGK	Medium expression promoter. Highest efficiency in stem cells ; Sustains stable activity in long term cultures of undifferentiated stem cells.
UbC	Relatively low expression promoter ; Sustains stable expression.

Tag: The CMV promoter vectors are offered with His or HA Tag. The addition of a tag can help you detect the protein expressed by western blot or IHC, or facilitate downstream protein purification if needed.

Reporters: **abm** offers both GFP and RFP in Fusion (in frame) with your gene of interest and in Bicistronic (driven by a separate promoter) formats.

Bicistronic/Tricistronic: By utilizing divergent promoters and Protein 2A, you can use these lentiviral vectors to express multiple genes in the same construct.

Products List

Lentiviral Systems

- Lentivirus Constitutive Vectors
 - Lentivirus CMV Promoter Vectors
 - His Tag Lentiviral Vector | HA Tag Lentiviral Vector | HA-III Tag Lentiviral Vector
 - Lentivirus UbC, PGK or EF1 α Promoter Vectors
 - UbC Promoter Lentiviral Vector | PGK Promoter Lentiviral Vector | EF1 α Promoter Lentiviral Vector
 - Lentivirus Promoterless Vectors
 - Promoterless Lentiviral Vector | Promoterless GFP and Luc Lentiviral Vector
- Bicistronic/Tricistronic Lentiviral Vectors
- siRNA Lentiviral Vectors
- miRNA Lentiviral Vectors
 - miRNA Overexpression | miRNA Inhibition Lentiviral Vector
- CRISPR/Cas9 Lentiviral Vectors
 - sgRNA Lentiviral Vector for Knock-in, Knock-out, Activation and Repression
- LncRNA and anti-sense Lentiviral Vectors
- RFP / GFP / CFP Fusion Tag Lentiviral Vectors
- GFP / RFP Bicistronic Lentiviral Vectors
- Reporter Lentiviruses
- Blank Control Lentiviral Vectors | Blank Control Lentiviruses
- Therapeutic Lentiviral Vectors
- ProAdhere 293T Cells (LV592 1x10⁶ cells/1.0 ml)

Lentiviral Expression Systems



Reporter Lentiviruses

Cat. No.	Product	Selection Marker	Quantity	Titer
LV006	GFP Control Lentivirus	Neomycin	10 ml	1x10 ⁶ IU/ml
LV058	RFP Control Lentivirus	Neomycin	10 ml	1x10 ⁶ IU/ml
LV095	GFP Control Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV096	RFP Control Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV007	β-Gal Control Lentivirus	Neomycin	10 ml	1x10 ⁶ IU/ml
LV027	Lenti-UbC-GFP Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV028	Lenti-PGK-GFP Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV088	Lenti-PGK-Luc Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV046	Lenti-EF1α-GFP Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV051	Lenti-UbC-Luc2 Lentivirus	Puromycin	10 ml	1x10 ⁶ IU/ml
LV152	Lenti-II-CMV-Luc-IRES-GFP Lentivirus	Neomycin	10 ml	1x10 ⁶ IU/ml

Blank Control Lentiviral Vectors

LV587	pLenti-III-Blank Vector	Puromycin	1.0 µg
LV588	pLenti-EF1a-Blank Vector	Puromycin	1.0 µg
LV589	pLenti-UbC-Blank Vector	Puromycin	1.0 µg
LV590	pLenti-CMV-GFP-2A-Puro-Blank Vector	Puromycin	1.0 µg
LV591	pLenti-CMV-RFP-2A-Puro-Blank Vector	Puromycin	1.0 µg
LV627	pLenti-PGK-Blank Vector	Puromycin	1.0 µg
LV628	pLenti-PGK-GFP Vector	Puromycin	1.0 µg

Blank Control Lentiviruses

LVP690	Lenti-CMV-GFP-2A-Puro-Blank Lentivirus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP691	Lenti-CMV-RFP-2A-Puro-Blank Lentivirus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP687	Lenti-III-Blank Lentivirus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP688	Lenti-EF1a-Blank Lentivirus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP689	Lenti-UbC-Blank Lentivirus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP627	pLenti-PGK-Blank Virus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml
LVP628	pLenti-PGK-GFP Virus	Puromycin	200 µl	1x10 ⁷ IU/1.0 ml

Lentiviral Expression Systems

siRNA Lentival Vector

	Kit Cat #	LV300	LV301	LV310	LV311	LV098	LV099	Individual Cat #
Linear iLenti™ Vector	25ul	✓		✓				LV014
Linear iLenti™ GFP Vector	25ul		✓		✓			LV016
Lenti-Packaging Mix	100ug	✓	✓	✓	✓	✓		LV003
Lentifectin™	1.0ml	✓	✓			✓		G074
293T Cells	1x10 ⁶	✓	✓				✓	LV010
Lenti-GFP	10ug	✓	✓				✓	LV011-a
iLenti Sequencing Primers	100ul	✓	✓	✓	✓			LV012

i000238c	si-Scrambled siRNA/shRNA/RNAi Lentivector (Target c)					iLenti-GFP-Construct	500 ng
LV015	Scrambled siRNA Lentivector					iLenti-siRNA	500 ng
LV015-G	Scrambled siRNA GFP Lentivector					piLenti-siRNA-GFP	500 ng
LV015-N	Scrambled siRNA GFP Lentivector with Neomycin					pGFP-iLenti	500 ng
iV000238c	si-Scrambled siRNA/shRNA/RNAi Lentivirus (Target c)					iLenti-GFP-Construct	2 x 200 µl
LVP015	Scrambled siRNA Lentivirus pooled					piLenti-siRNA	2 x 200 µl
LVP015-G	Scrambled siRNA GFP Lentivirus pooled					piLenti-siRNA-GFP	2 x 200 µl
LVP015-N	Scrambled siRNA GFP Lentivirus with Neomycin					pGFP-iLenti	2 x 200 µl
G037	Competent Cells-DH5α						100 µl

Lentiviral Packaging Related Products

LV003	2nd Generation Packaging System Mix	200ul
LV003-G074	2nd Generation Packaging Mix & Lentifectin Combo Pack	Kit
LV053	3rd Generation Packaging System Mix	200ul
LV053-G074	3rd Generation Packaging Mix & Lentifectin Combo Pack	Kit
G074	Lentifectin™ Transfection Reagent	1.0 ml
G171	PuRetro™ Lentivirus Purification Kit	2 Standard Units
G172	PuRetro™ Lentivirus Purification Kit	5 Standard Units
G173	PuRetro™ Lentivirus Purification Kit	2 Giga Units
LV998	Ultra-Pure Lentivirus Purification Kit	Kit
LV999	Speedy Lentivirus Purification	100 ml
LV900	qPCR Lentivirus Titration(Titer) Kit	100 Reactions
LV900-R/LR/S/iC	qPCR Lentivirus Complete Titration Kit (MasterMix-R/LR/S/iC)	100 Reactions
G698	ViralPlus Transduction Enhancer	1.0 ml
G511	ViralMAX1 Transduction Enhancer	0.5mg
G512	ViralMAX2 Transduction Enhancer	0.5mg
G513	ViralMAX3 Transduction Enhancer	0.5mg
G514	ViralMAX Combo Package (0.5mg each of ViralMAX1, ViralMAX2 and ViralMAX3)	3 x 0.5mg
G062	Polybrene	1.0 ml; 0.8 mg/ml
G614	Instant Lentivirus Titration Card	10 Tests
G615	Instant Lentivirus Titration Card	20 Tests
LV010	293T Cells	1 x 10 ⁶ cells/ml

Lentiviral Expression Systems



Custom Lentivirus

Custom Lentivirus Production	Enough DNA Provided	Custom Recombinant Lentivirus (10^6 IU/ml; 10 ml)	LV001
		High-Titer Custom Recombinant Lentivirus (10^7 IU/ml; 1.0 ml)	LV001-a
		High-Titer Custom Recombinant Lentivirus (10^8 IU/ml; 550 μ l)	LV001-b
		High-Titer Custom Recombinant Lentivirus (10^9 IU/ml; 5 x 20 μ l)	LV001-c
		High-Titer Custom Recombinant Lentivirus (10^{10} IU/ml; 5 x 20 μ l)	LV001-d
	DNA Amplification Required	Custom Recombinant Lentivirus (10^6 IU/ml; 10 ml)	LV002
		High-Titer Custom Recombinant Lentivirus (10^7 IU/ml; 1.0 ml)	LV002-a
		High-Titer Custom Recombinant Lentivirus (10^8 IU/ml; 550 μ l)	LV002-b
		High-Titer Custom Recombinant Lentivirus (10^9 IU/ml; 5 x 20 μ l)	LV002-c
		High-Titer Custom Recombinant Lentivirus (10^{10} IU/ml; 5 x 20 μ l)	LV002-d
Custom Lentivirus Titration	qPCR Based (Detectable Range of 10^4 - 10^{10} IU/ml)	C099	

*For customer supplied vectors, **abm** is only able to guarantee successful virus packaging as verified by our qPCR-based lentivirus titration assay. We recommend that gene expression and any other desired vector functionality is verified by transfection of the cells the virus is to be utilized in prior to submitting your plasmids for packaging.

**For customer supplied vectors, the customer must indicate prior to the service if any reporter expression will be expected or not. The expected reporter expression, e.g. GFP, should not require induction of expression. Due to differences in excitation/emission wavelengths for different fluorophores, we may not be able to provide infection images for fluorescent reporter expression other than standard GFP/RFP/mCherry.

Description

Recombinant lentiviral vectors have been shown to be powerful tools for stable gene transfer to both dividing and non-dividing cells in vitro and in vivo. Through years of experience with lentiviral vectors, **abm** has developed its own proprietary pLenti-Combo packaging mix and an efficient protocol for rapid production and preparation of recombinant lentiviral vectors/particles with titers up to 10^{10} IU/ml.

Adenovirus Expression Systems

abm's Adenovirus system offers ;

- High infection efficiency and subsequent yield of recombinant protein
- Broad host range (dividing and non-dividing, stem cells, and primary cells)
- Non integrating (no risk of affecting host gene expression)
- Large insert capacity (up to 8 kb)
- Low immunogenicity (post-infection cell viability is very high)
- Can be used in vivo and in vitro
- Biosafety: We use replication-incompetent (-E1/-E3) human adenovirus type 5 (Ad5)

abm offers a comprehensive library of premade adenoviruses containing full-length ORFs for human, mouse, and rat genes driven by a strong CMV promoter.

As part of our adenovirus expression system, our recombinant adenoviruses are available with a choice of no tag, His tag, HA tag, or GFP reporter. abm's premade adenoviruses are delivered to you packaged and ready to use.

For any other unique requirements, our Custom Recombinant Adenovirus Service can be used to produce packaged adenoviruses containing your transgene of interest or RNAi for gene silencing.

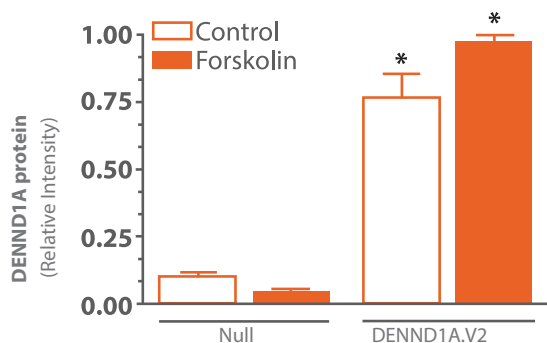


Figure 2: DENND1A.v2 expression in normal theca cells after infection with a cDNA adenovirus. Quantitative Western analysis following infection of normal theca cells with 3 pfu Null or DENND1A.V2 adenovirus to confirm DENND1A.V2 protein expression after adenoviral infection. Cells were treated in absence or presence of 20 μ M forskolin for 72h.

Data from Figure 5b of McAllister, J. et al (2014). Overexpression of a DENND1A isoform produces a polycystic ovary syndrome theca phenotype. PNAS, 111(15) pp.E1519-27.

Control Adenoviruses

000047A	Adeno CMV Null Adenovirus	1.0 ml	>1x10 ⁶ pfu/mL
000048A	Adenovirus Null Adenovirus	1.0 ml	>1x10 ⁶ pfu/mL
000197A	β -gal Adenovirus (E. coli)	1.0 ml	>1x10 ⁶ pfu/mL
000200A	RFP Adenovirus (Fish)	1.0 ml	>1x10 ⁶ pfu/mL
000541A	GFP Adenovirus	1.0 ml	>1x10 ⁶ pfu/mL

Adenoviral Related Kits

A902	Add-N-Pure Purification Kit	2 Standard Units
A905	Add-N-Pure Purification Kit	5 Standard Units
A910	Add-N-Pure Purification Kit	2 Giga Units
G097	Anti-Adenovirus Hexon Antibody	100 μ g

Custom Recombinant Adenovirus Service

Service	Description	Cat. No.
cDNA Adenovirus Production	Recomb. Adenovirus Expressing cDNA (1 ml of 10 ⁶ pfu/ml)	C001
RNAi Adenovirus Production	Recomb. Adenovirus Expressing 1 siRNA (1 ml of 10 ⁶ pfu/ml)	C002
Adenovirus Concentration	Recomb. Adenovirus Amplification (2-3 ml of 10 ⁹ pfu/ml)	C070
	Recomb. Adenovirus Amplification (2-3 ml of 10 ¹⁰ pfu/ml)	C071
	Recomb. Adenovirus Amplification (5 x 200 µl of 10 ¹¹ pfu/ml)	C072
	Recomb. Adenovirus Amplification (5 x 200 µl of 10 ¹² pfu/ml)	C005
Plaque Purification	Using ABMC1 Cells	C004
Plaque Assay	Adenovirus Titer	C006
RCA Assay	Using A549 Cells	C007
TCID50 Assay	Using 293 Cells	C008
293 Cell Line	Low Passages for Viral Production	C009
Neutral Red	0.33% [w/v]; 5x1.0ml	G035

Any additional assays required (such as those listed above) can be provided on request, at an additional cost. The viral titre will be calculated by end-point dilution assay by default. **abm** cannot guarantee titer discrepancies through any other quantification methods.

For customer supplied vectors or seed stock, the customer must indicate prior to the service if any reporter expression will be expected or not. The expected reporter expression, e.g. GFP, should not require induction of expression. Due to differences in excitation/emission wavelengths for different fluorophores, we may not be able to provide infection images for fluorescent reporter expression other than standard GFP/RFP/mCherry.

Description

Recombinant adenoviruses are versatile and highly efficient tools used for gene delivery and expression in mammalian cells. Numerous biological features of adenoviruses have made them the vector of choice for both in vitro and in vivo applications. They can infect a broad range of cell types with the highest efficiency. Additionally, their infection is not dependent on active host cell division. Another key feature for recombinant adenovirus is that high virus titers and high-level gene expression can be obtained in most mammalian cells.

abm produces custom recombinant adenovirus containing full-length cDNA, allowing high level gene expression in host cells or an adenovirus construct containing RNAi oligos specific to a target gene to generate efficient elimination of target gene expression.

Vectors

A002	pShuttle (+)	1.0 µg
A003	pShuttle (-)	1.0 µg
A012	pSiShuttle	1.0 µg
C029	pShuttle Primer	250 µl (10 µM)

Related Products

000012A	CMV-β-gal Adenovirus(E. coli)	1.0 ml
000013A	Adenovirus 5 Adenovirus (Human)	1.0 ml
000541A	GFP Adenovirus	1.0 ml

*Free with custom service orders where customer clones the insert into pShuttle/pSiShuttle.

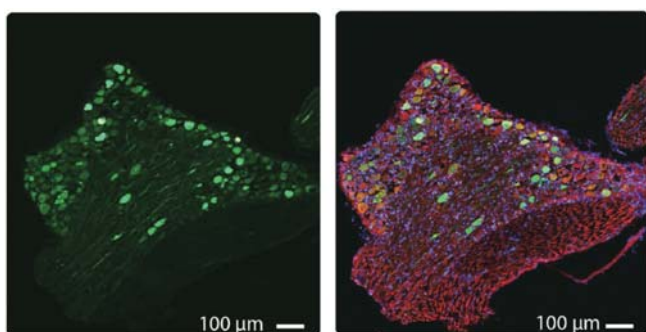
Adeno-Associated Virus (AAV)

Among all viral vectors, the recombinant Adeno-Associated Virus (AAV) is the most promising candidate for gene therapy and regenerative medicine due to its low pathogenicity and minimally integrating nature. **abm**'s Adeno-Associated viral system offers;

- Infects both dividing and non-dividing cells
- Has low immunogenicity and pathogenicity
- Can target a broad range of specific tissue types
- Provides long-term expression in non-dividing cells
- No integration into the host genome

abm's complete library of premade AAV vectors and prepackaged AAV particles for human, mouse, and rat genes are available with a wide selection of reporters (GFP and Luciferase) and promoters (CMV, EF1 α , PGK, CAGGS, and MSCV).

We also offer a full library of AAV siRNA and miRNA vectors and viruses as well as Custom AAV Services.



Left: EGFP expression (Green) in lumbar neuronal cells 4 weeks after intrathecal injection of AAV-EGFP Serotype 9 (Cat. # iAAV01509) into mice.

Right: Overlay with β -tubulin (red) and DAPI (blue). Image courtesy of Dr. Douglas Lopes, King's College London.

Don't Know Which Serotype To Use?

Try our Serotype BLAST Kit or selection of control viruses AAV Blank Control Virus (CMV), AAV Blank Control Virus (CMV) (GFP), or AAV Blank Control Virus (CMV) (Luc) to optimize your experiments

AAV Serotype	CNS/Retina	Heart	Lung	Liver	Skeletal Muscle
AAV1	X	X	X	-	X
AAV2	X	-	-	X	X
AAV3	X	X	-	X	-
AAV4	X	X	-	-	-
AAV5	X	-	X	-	-
AAV6	-	X	X	X	X
AAV7	X	-	-	X	X
AAV8	X	-	-	X	X
AAV9	X	X	X	X	X
AAV DJ	X	-	X	X	-
AAVDJ-8	X	-	X	X	-

Tissue Specificity (x = recommended application)

Don't Know Which Promoter To Use?

CMV (Strong)	A widely used promoter that provides strong gene expression in most cells (weak activity in human and mouse stem cells).
EF1 α	Strong expression promoter; highly efficient in stem cells. Good for stable expression from long term cultures.
PGK (Medium)	A high efficiency promoter able to sustain stable activity in long term cultures of undifferentiated stem cells.
CAGGS (Strong)	A large hybrid promoter (composed of the CMV immediate-early enhancer as well as the CBA and CBA intron 1/exon 1 promoter) with no methylation issues (max.insert size:2kb).
MSCV (Medium-Strong)	A small promoter suitable for all cell types (especially stem cells) that allows for larger gene inserts.

Adeno-Associated Virus (AAV)



Custom Adeno-Associated Virus (AAV) Service

Gene Synthesis

C098	Gene Synthesis	Per bp
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Custom AAV Plasmid Cloning

C234	Custom AAV plasmid cloning with compatible insert	
C235	Custom AAV plasmid cloning without compatible insert	

Custom AAV Production

Custom AAV (10^9 GC/ml) (AAVxx)	5 x 200 μ l
Custom AAV (10^{12} GC/ml) (AAVxx)	2 x 100 μ l
Custom AAV (10^{13} GC/ml) (AAVxx)	2 x 100 μ l

xx : Serotype No.

Custom siRNA AAV Production

Custom AAV siRNA Pooled Vector	1.0 μ g
AAV siRNA Pooled Virus (AAVxx) (10^9 GC/ml)	5 x 200 μ l

xx : Serotype No.

Titer Upgrades for Existing AAV Viruses

C288	10^9 AAV Virus to High Titer (10^{12} GC/ml)	2 x 100 μ l
C289	10^9 AAV Virus to High Titer (10^{13} GC/ml)	2 x 100 μ l

AAV Cell Line 10^6 Cells

C236	AAV Packaging Cell Line for High Titer Virus Production	
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AAV Packaging Mix

AAV1001	AAV Packaging Mix (Serotype 1)	100 μ g
AAV1002	AAV Packaging Mix (Serotype 2)	100 μ g
AAV1003	AAV Packaging Mix (Serotype 3)	100 μ g
AAV1004	AAV Packaging Mix (Serotype 4)	100 μ g
AAV1005	AAV Packaging Mix (Serotype 5)	100 μ g
AAV1006	AAV Packaging Mix (Serotype 6)	100 μ g
AAV002	AAV Blank Control Vector (CMV) (Luc)	1 μ g
AAV003	AAV Blank Control Vector (CMV) (GFP)	1 μ g
G2100	DNAfectin 2100 Transfection Reagent	1.0 mg/1.0 ml

qPCR Adeno-Associated Virus Titration (Titer) Kit

G931	qPCR Adeno-Associated Virus Titration (Titer) Kit	100rxns
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AAV Serotype Blast™ Kit

AAV099	AAV Serotype Blast™ Kit	1×10^9 GC/ml	9 x 100 μ l
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Viral Expression Systems

Retroviral Expression Systems

The Retrovirus offers;

- Integration of genetic material specifically into dividing cells
- Broad tropism for infection of a variety of mammalian cells
- Safe to use, the replication-incompetent retrovirus has minimal relation to the wild type Moloney Murine Leukemia Virus (MMLV)

abm's retroviral vectors and retroviruses are available for every human, mouse, and rat gene driven by the CMV promoter and available with either no Tag, HA tag or GFP reporter. Custom Restrovirus Services are also available.

E-510	Retro-Combo Mix	Retrovirus packaging plasmid mix	75 µg	
E-511	Pack-Easy Cells	Retrovirus packaging cell lines	Vial	
RV001	pRetroG-CMV-blank Vector		1.0 µg	
RV002	pRetroG-CMV-GFP-HA Vector		1.0 µg	
RV003	pRetroG-CMV-GFP-stop Vector		1.0 µg	
RV004	pRetroG-CMV-GFP-IRES-GFP Vector		1.0 µg	
RV005	pRetroG-CMV-RFP-stop Vector		1.0 µg	
RVP001	Retro-CMV Blank Retrovirus		1 ml	10 ⁶ IU/ml
RVP002	Retro-CMV-GFP-HA Retrovirus		1 ml	10 ⁶ IU/ml
RVP003	Retro-CMV-GFP Retrovirus		1 ml	10 ⁶ IU/ml
RVP004	Retro-CMV-GFP-IRES-GFP Retrovirus		1 ml	10 ⁶ IU/ml
RVP005	Retro-CMV-RFP Retrovirus		1 ml	10 ⁶ IU/ml

Herpes Simplex Viral Vectors and Viruses (HSV)

The Herpes Simplex Virus is most commonly used for lifelong preventative or therapeutic gene transfer of large transgenes into cells that have low transduction efficiency using other systems (e.g. neurons). The HSV system offers;

- Long-term non-toxic persistent infection of its host (particularly in neurons)
- Transient transgene expression
- Broad tropism for infection of a wide range of host cells
- Ability to deliver genes to post-mitotic cell types
- Delivery of large transgenes to the nucleus of mammalian cells
- Non-integrating gene delivery (but can replicate separately from host cell genome)

abm's Custom HSV Service is available with the CMV promoter (others are available upon request), with or without the addition of a GFP reporter, and includes custom gene synthesis/subcloning and viral production.

Baculoviral Vectors and Viruses

The Baculovirus System is commonly used to deliver genes into insect cells in order to achieve high yields of recombinant protein. This helper-independent system can be used for long-term expression of heterologous genes and offers;

- High yields of recombinant protein compared to bacterial expression systems
- An alternative expression system when bacterial expression is not feasible
- Expression of genes from bacteria, viruses, plants and mammals at levels from 1-500 mg/l
- Post-translational modifications such as phosphorylation, glycosylation and acylation (similar to mammalian processes) suitable for functional/structural studies
- Biosafety Level 1, as the baculovirus does not infect human cells

abm's Custom Baculovirus System includes both gene synthesis/subcloning and viral production. In addition, large-scale protein production service (involving culturing and infection of insect cells) is also available.

Viral Expression Systems



Summary of abm's Viral Vectors and Viruses

Characteristic	Lentivirus	Adenovirus	Adeno-Associated virus (AAV)	Retrovirus	Herpes Simplex Virus (HSV)	Baculovirus
Packaging Capacity	8 kb	8 kb	4.7 kb	8 kb	Theoretically up to 150 kb	Theoretically >100 kb
Transduction Efficiency	●●●	●●●●	●●●	●●●	●●●	●●●
Infection	Most Dividing/ Non-Dividing Cells	Most Dividing/ Non-dividing Cells (with high transduction rate towards Primary Cells)	All Cell Types (depending on Serotype)	Dividing Cells	Most Dividing/Non-Dividing Cells (ideal for Neuronal Cells)	Most Dividing/ Non-Dividing Cells (including Bacterial, Insect, Plant, and Mammalian Cells)
Expression	Stable	Transient	Transient or Stable	Stable	Transient	Transient or Stable
Integrating	Yes	No	Site-specific integration	Yes	No (but may replicate separately from the host)	No
Immune Response	●●●	●●●●●	●●	●●●●	●●●●●	●●●
Genetic Material	RNA	Double Stranded Linear DNA	Single Stranded Linear DNA	RNA	Double Stranded Linear DNA	Double Stranded Linear DNA

● Low ●●●●● High

	Lentivirus	Adenovirus	Adeno-associated virus (AAV)	Retrovirus	Herpes Simplex Virus (HSV)	Baculovirus
Genes available	Ready-to-use vectors and prepackaged viruses containing any human, mouse, or rat gene. Custom Services are also available				Custom Service	Custom Service
Gene Over-expression	ORF, miRNA inhibitors	ORF, miRNA inhibitors	ORF, miRNA inhibitors	ORF	ORF	ORF
Gene Silencing	siRNA, miRNA, shRNA	siRNA, miRNA	siRNA, miRNA	-	-	-
Promoters available	CMV, EF1α, UbC, PGK, H1 (for RNA; miRNA)	CMV	CMV, EF1α, PGK, CAGGS, MSCV	CMV	CMV	polh and p10
Other types of expression	CRISPR/Cas9, lncRNA, antisense RNA	CRISPR/Cas9, lncRNA, antisense RNA	CRISPR/Cas9	-	-	-
Tags/Reporters available	No tag or with HA tag, GFP and RFP available in a Bicistronic format	No tag, His tag, HA tag, GFP Reporter	No tag, GFP, Luciferase	No tag, HA tag, GFP Reporter	GFP, no GFP	No reporter, GFP, RFP
Titers available	10 ⁶ , 10 ⁷ , 10 ⁸ , 10 ⁹ , 10 ¹⁰ IU/ml	10 ⁶ , 10 ⁹ , 10 ¹⁰ , 10 ¹¹ , 10 ¹² pfu/ml	10 ⁹ , 10 ¹² , 10 ¹³ GC/ml	10 ⁵ , 10 ⁶ , 10 ⁷ , 10 ⁸ IU/ml	10 ⁶ , 10 ⁷ IU/ml	10 ⁶ , 10 ⁷ IU/ml

Viral Expression Systems

Gene Regulation (siRNA, miRNA, lncRNA) Vectors and Viruses

For gene regulation and functional studies, **abm** offers a variety of expression systems for:

- **siRNA**: efficiently express any target siRNA to knockdown any gene (lentivector comes with GFP or no reporter) without the need to design hair-pin loop structures using our unique iLenti™ RNAi Expression System
- **miRNA**: inhibit or over-express any miRNA for studies of post-translational gene regulation in mammalian systems using our ready-to-use viral vectors and packaged viruses
- **lncRNA/antisense RNA**: select from premade vectors and viruses for overexpression or knockdown of lncRNA or antisense RNAs for studies of embryonic regulation, histone modification, post-transcriptional gene regulation, miRNA processing, and more
- **UTR and Promoter Reporter platform**: quantitatively study a specific miRNA's regulation of its target gene using our 3'UTR platform or study promoter and 5'UTR elements using our custom reporters, all available as a library of premade lentiviral vectors and lentiviruses for any human or mouse gene

	Lenti-		AAV-		Adenovirus
	Vector	Virus	Vector	Virus	
siRNA/shRNA	✓	✓	✓	✓	✓
miRNA overexpression/inhibition	✓	✓	✓	✓	✓
lncRNA/antisense RNA	✓	✓	✓	✓	✓
5' UTR, 3'UTR or Promoter Reporter Platform	✓	✓			

Scrambled siRNA/shRNA/RNAi vectors and viruses

Cat. No.	Product Name	Vector	Size
LV015	Scrambled siRNA Lentivector	iLenti-siRNA	500 ng
LV015-G	Scrambled siRNA GFP Lentivector	piLenti-siRNA-GFP	500 ng
LV015-N	Scrambled siRNA GFP Lentivector with Neomycin	pGFP-iLenti	500 ng
LVP015	Scrambled siRNA Lentivirus pooled	piLenti-siRNA	2 x 200 µl
LVP015-G	Scrambled siRNA GFP Lentivirus pooled	piLenti-siRNA-GFP	2 x 200 µl
LVP015-N	Scrambled siRNA GFP Lentivirus with Neomycin	pGFP-iLenti	2 x 200 µl
iAAV01500	Scrambled AAV siRNA Control Vector	pAAV-siRNA-GFP	1.0 µg
iAAV01501	Scrambled AAV siRNA Control Virus (Serotype 1)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01502	Scrambled AAV siRNA Control Virus (Serotype 2)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01503	Scrambled AAV siRNA Control Virus (Serotype 3)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01504	Scrambled AAV siRNA Control Virus (Serotype 4)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01505	Scrambled AAV siRNA Control Virus (Serotype 5)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01506	Scrambled AAV siRNA Control Virus (Serotype 6)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01507	Scrambled AAV siRNA Control Virus (Serotype 7)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01508	Scrambled AAV siRNA Control Virus (Serotype 8)	pAAV-siRNA-GFP	5 x 200 µl
iAAV01509	Scrambled AAV siRNA Control Virus (Serotype 9)	pAAV-siRNA-GFP	5 x 200 µl
000202A	Scrambled shRNA Adenovirus	pAdeno	1.0 ml
000145A	Scrambled siRNA Adenovirus	pAdeno	1.0 ml

miRNA Controls

Cat. No.	Product	Size	Titer
M003	pLenti-III-mir-Blank Control Vector	500 ng	
M001	pLenti-III-mir-GFP Control Vector	500 ng	
M007	pLenti-III-mir-Off Control Vector	500 ng	
M004	pLenti-III-mir-Blank Control Virus	2 x 50 µl	>10 ⁷ pfu/ml
M002	pLenti-III-mir-GFP Control Virus	2 x 50 µl	>10 ⁷ pfu/ml
M008	pLenti-III-mir-Off Control Virus	2 x 50 µl	>10 ⁷ pfu/ml
M009	AdmiRa Control Virus	1.0 ml	>10 ⁶ pfu/ml
M010	AdmiRa-Off Control Virus	1.0 ml	>10 ⁶ pfu/ml
Am00100	pAAV-mir-GFP-Blank Control Vector	500 ng	
Am00700	pAAV-miR-Off-Blank Control Vector	500 ng	
Am00101	AAV-mir-GFP-Blank Control Virus (Serotype 1)	5 x 200 µl	>10 ⁹ pfu/ml
Am00102	AAV-mir-GFP-Blank Control Virus (Serotype 2)	5 x 200 µl	>10 ⁹ pfu/ml
Am00103	AAV-mir-GFP-Blank Control Virus (Serotype 3)	5 x 200 µl	>10 ⁹ pfu/ml
Am00104	AAV-mir-GFP-Blank Control Virus (Serotype 4)	5 x 200 µl	>10 ⁹ pfu/ml
Am00105	AAV-mir-GFP-Blank Control Virus (Serotype 5)	5 x 200 µl	>10 ⁹ pfu/ml
Am00106	AAV-mir-GFP-Blank Control Virus (Serotype 6)	5 x 200 µl	>10 ⁹ pfu/ml
Am00107	AAV-mir-GFP-Blank Control Virus (Serotype 7)	5 x 200 µl	>10 ⁹ pfu/ml
Am00108	AAV-mir-GFP-Blank Control Virus (Serotype 8)	5 x 200 µl	>10 ⁹ pfu/ml
Am00109	AAV-mir-GFP-Blank Control Virus (Serotype 9)	5 x 200 µl	>10 ⁹ pfu/ml
Am00110	AAV-mir-GFP-Blank Control Virus (Serotype 10)	5 x 200 µl	>10 ⁹ pfu/ml
Am00701	AAV-mir-Off-Blank Control Virus (Serotype 1)	5 x 200 µl	>10 ⁹ pfu/ml
Am00702	AAV-mir-Off-Blank Control Virus (Serotype 2)	5 x 200 µl	>10 ⁹ pfu/ml
Am00703	AAV-mir-Off-Blank Control Virus (Serotype 3)	5 x 200 µl	>10 ⁹ pfu/ml
Am00704	AAV-mir-Off-Blank Control Virus (Serotype 4)	5 x 200 µl	>10 ⁹ pfu/ml
Am00705	AAV-mir-Off-Blank Control Virus (Serotype 5)	5 x 200 µl	>10 ⁹ pfu/ml
Am00706	AAV-mir-Off-Blank Control Virus (Serotype 6)	5 x 200 µl	>10 ⁹ pfu/ml
Am00707	AAV-mir-Off-Blank Control Virus (Serotype 7)	5 x 200 µl	>10 ⁹ pfu/ml
Am00708	AAV-mir-Off-Blank Control Virus (Serotype 8)	5 x 200 µl	>10 ⁹ pfu/ml
Am00709	AAV-mir-Off-Blank Control Virus (Serotype 9)	5 x 200 µl	>10 ⁹ pfu/ml
Am00710	AAV-mir-Off-Blank Control Virus (Serotype 10)	5 x 200 µl	>10 ⁹ pfu/ml

Viral Expression Systems

Universal and House Keeping miRNA Primers

MPH00000	Universal 3' miRNA Primer	Universal	N/A	150 µl / 10 µM
MPH00001	U6-2 House Keeping Primers	Human	NR_002752	150 µl / 10 µM
MPH00003	SNORD44 House Keeping Primers	Human	NR_002750	150 µl / 10 µM
MPH00004	SNORD47 House Keeping Primers	Human	X96647.1	150 µl / 10 µM
MPH00005	SNORD48 House Keeping Primers	Human	NR_002745	150 µl / 10 µM

C. elegans Control Primers and Spike-In Control Templates

MPH00006	cel-miR-39-3p Control Primer	C. elegans	MIMAT0000010	150 µl / 10 µM
MPH00007	cel-miR-39-5p Control Primer	C. elegans	MIMAT0020306	150 µl / 10 µM
MPH00008	cel-miR-67-3p Control Primer	C. elegans	MIMAT0000039	150 µl / 10 µM
MPH00009	cel-miR-239b-5p Control Primer	C. elegans	MIMAT0000295	150 µl / 10 µM
MCH00001	cel-miR-39-3p Control Template	C. elegans	MIMAT0000010	2 x 2.5 nmol
MCH00002	cel-miR-39-5p Control Template	C. elegans	MIMAT0020306	2 x 2.5 nmol
MCH00003	cel-miR-67-3p Control Template	C. elegans	MIMAT0000039	2 x 2.5 nmol
MCH00004	cel-miR-239b-5p Control Template	C. elegans	MIMAT0000295	2 x 2.5 nmol

miRNA Mimic and Inhibitor Controls

MCH00000	miRNA Mimic Negative Control			2.5 nmol
MAH00000	miRNA Agomir Negative Control			2.5 nmol
MIH00000	miRNA Inhibitor Negative Control			5 nmol
MNH00000	miRNA Antagomir Negative Control			5 nmol

miRNA Cloning and Packaging

M016	pLenti-III-mir-GFP Cloning Vector			500 ng
MK001	Complete 2nd Generation miRNA Lentivirus Packaging Kit			1 kit
MK002	Complete 3rd Generation miRNA Lentivirus Packaging Kit			1 kit
MK003	Partial 2nd Generation miRNA Lentivirus Packaging Kit			1 kit
MK004	Partial 3rd Generation miRNA Lentivirus Packaging Kit			1 kit
LV998	Ultra-Pure Lentivirus Purification Kit			1 kit

miRNA cDNA Synthesis

G269	miRNA cDNA Synthesis Kit			25 reactions
G270	miRNA cDNA Synthesis Kit			100 reactions
G902	miRNA cDNA Synthesis Kit, with Poly(A) Polymerase Tailing			25 reactions
G903	miRNA cDNA Synthesis Kit, with Poly(A) Polymerase Tailing			100 reactions

CRISPR Cas9 Expression Vectors and Viruses

CRISPR is the most versatile technology for genome editing. **abm's** offers a variety of vectors and viruses for the expression of Cas9 and its variants. Pair these with sgRNA expression vectors or viruses from our human, mouse and rat Genome-Wide sgRNA Libraries or a custom sgRNA. For CRISPR Knock In a repair template is also needed.

NEW CRISPR activation (CRISPRa) and CRISPR interference (CRISPRi) are emerging technologies for modulation of gene activity. These technologies use a catalytically inactive Cas9 (dCas9) fused to an effector domain. The dCas9 portion is targeted to a specific promoter using an sgRNA; the effector domain then acts to induce (dCas9-SAM) or repress (dCas9-KRAB) the expression of that gene. For dCas9-SAM the sgRNA targets upstream of the promoter can be selected from our CRISPR Activation Genome-Wide Library or ordered as a custom sgRNA. For dCas9-KRAB the sgRNA targets immediately downstream of the transcription start site, the sgRNA can be ordered as a custom sgRNA.

Cas9 Non-Viral Vector Systems

K095	Cas9 Nuclease Non-Viral Vector	10 µg
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Cas9 Viral Systems

K002	Cas9 Nuclease Lentiviral Vector	10 µg	
K005	Cas9 Nickase Lentiviral Vector	10 µg	
K012	Cas9 Double Mutant Lentiviral Vector	10 µg	
K014	dCas9 C-terminal Cloning Vector	10 µg	
K015	dCas9 Synergistic Activation Mediator Lentivector	10 µg	
K203	dCas9-KRAB Lentiviral Vector	10 µg	
K003	Cas9 Nuclease Lentivirus	300 µl	10 ⁷ IU/ml
K006	Cas9 Nickase Lentivirus	300 µl	10 ⁷ IU/ml
K013	Cas9 Double Mutant Lentivirus	300 µl	10 ⁷ IU/ml
K016	dCas9 Synergistic Activation Mediator Lentivirus	300 µl	10 ⁷ IU/ml
K204	dCas9-KRAB Lentivirus	300 µl	10 ⁷ IU/ml
K207	saCas9 Nuclease AAV Vector	10 µg	
K208	saCas9 Nuclease AAV Virus (AAV1)	2 x 250 µl	1 x 10 ⁹ GC/ml
K209	saCas9 Nuclease AAV Virus (AAV2)	2 x 250 µl	1 x 10 ⁹ GC/ml
K210	saCas9 Nuclease AAV Virus (AAV3)	2 x 250 µl	1 x 10 ⁹ GC/ml
K211	saCas9 Nuclease AAV Virus (AAV4)	2 x 250 µl	1 x 10 ⁹ GC/ml
K212	saCas9 Nuclease AAV Virus (AAV5)	2 x 250 µl	1 x 10 ⁹ GC/ml
K213	saCas9 Nuclease AAV Virus (AAV6)	2 x 250 µl	1 x 10 ⁹ GC/ml
K214	saCas9 Nuclease AAV Virus (AAV7)	2 x 250 µl	1 x 10 ⁹ GC/ml
K215	saCas9 Nuclease AAV Virus (AAV8)	2 x 250 µl	1 x 10 ⁹ GC/ml
K216	saCas9 Nuclease AAV Virus (AAV9)	2 x 250 µl	1 x 10 ⁹ GC/ml
K217	saCas9 Nuclease AAV Virus (AAV10)	2 x 250 µl	1 x 10 ⁹ GC/ml
K218	saCas9 Nuclease AAV Virus (AAV11)	2 x 250 µl	1 x 10 ⁹ GC/ml
K004	Cas9 Nuclease Adenovirus	1.0 ml	10 ⁶ pfu/ml
K007	Cas9 Nickase Adenovirus	1.0 ml	10 ⁶ pfu/ml

Other Cas9 Related Products

G932	CRISPR Genomic Cleavage Detection Kit	25 Reactions
Y300079	Anti-Cas9 Antibody	100 µl
G698	ViralPlus Transduction Enhancer	1.0 ml

Viral Expression Systems

CRISPR Gene Editing Vectors and Viruses

	Lenti-		AAV-		Adenovirus	Non-Viral Vector
	Vector	Virus	Vector	Virus		
sgRNA for spCas9	✓	✓	✓	✓	✓	✓
sgRNA for saCas9			✓	✓		
All-in-One (sgRNA & spCas9 Nuclease)	✓	✓				✓
All-in-One (sgRNA & saCas9 Nuclease)			✓	✓		
Multiplex sgRNA with spCas9	✓	✓				

Non-viral ORFs and Protein Vectors

In addition to our extensive viral vector library, **abm** also offers a complete library of sequence verified human, mouse, and rat ORFs. These ORFs are ready for insertion into a protein expression system from our non-viral protein vector library, which offers:

- Option of expression in either a prokaryotic (E. coli, T7 promoter-based) or eukaryotic (mammalian cell, CMV promoter-based) system
- A choice of 5 tags (His, HA, MBP, GST, and D-tag)
- A complete list of human, mouse, or rat genes

Key features of abm's protein expression vectors include:

- The option for expression in either a prokaryotic (E. coli; T7 promoter based) or a eukaryotic (mammalian cell; CMV promoter based) system.
- A choice of 5 tags (His, HA, MBP, GST and D-tag; some in combination) with both N-terminal and C-terminal options for a His tag.
- A near complete library of human genes to choose from.

Can't find what you need? Take advantage of our complete Custom Services menu!

At **abm**, we pride ourselves in our flexibility and expertise in generating whatever gene expression system you need!

If you can't find a suitable promoter, reporter, or any other specification in our catalogue, please inquire with us as we also offer custom gene synthesis, cloning and viral packaging.

www.abmGood.com

search by product name, gene symbol, catalog number, etc.

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