Transfection Reagents

ESCORT™ Transfection Reagents

For stable and transient transfections in a wide variety of cell lines

The ESCORT series of reagents was designed to meet the specific requirements needed for effective transfections in a broad spectrum of cell lines. Each one was formulated to optimize transfection efficiency based on the cell host and experimental parameters. These parameters include: stable vs. transient, serum vs no serum, and mammalian vs. insect. All of the ESCORTS offer low toxicity levels and the flexibility to move from one common cell type to another.

ESCORT™ Transfection Reagent Selection Table

For information on additional cell lines, please visit our website at www.sigma-aldrich.com.

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Cell Line	ESCORT™	ESCORT™ II	' ESCORT™ III	ESCORT™ IV	ESCORT™ V	ESCORT™ V Kit-Enhanced
BHK		\checkmark				
C2C12						\checkmark
СНО		\checkmark		\checkmark		\checkmark
COS-7		\checkmark				
F9		\checkmark				\checkmark
HEK293T		\checkmark				
HeLa		\checkmark				\checkmark
Jurkat						
L8						\checkmark
L929		\checkmark				\checkmark
NIH3T3		\checkmark		\checkmark		
PC-12						
Sf 9				\checkmark		
T.ni.				\checkmark		
Vero						

Note: These are reagents recommended for the cell line indicated. ESCORT reagents not checked may also transfect these cell lines efficiently. Transfection efficiency may vary depending on the plasmid and cell line used.



Nontoxic and outperforms the competitors

Figure 2. Cell viability following transfection. Cells were transfected with pFLAG-CMV-2T^M, using ESCORT V, Competitors G and R transfection reagents according to the manufacturers' instructions. HeLa, HEK 293 and NIH 3T3 cell lines ($5x10^3$ cells/well) were plated into 96-well tissue culture plates. Relative cell viability was determined 24 hours after complex addition using the MTT assay.

Highly efficient transfection agent HeLa 700 600 500 3-gal mU/cm 400 300 200 100 Escort V Competitor F HEK 293 700 3-gal mU/cm² 600 500 400 300 200 100 Escort \ Competitor F NIH 3T3 160 140 120 β-gal mU/cm² 100 80 60 40 Competitor R

Figure 1. Performance comparison between ESCORT V™ and benchmark competitors.

HeLa, HEK 293 and NIH 3T3 cells were 60-80% confluent the day of transfection. The cells were transfected with pCMV-gal using ESCORT V or Competitors G and R transfection reagents according to the manufacturers' instructions.

After incubation for 44-48 hours under standard conditions, lysates were prepared with CelLytic M reagent (<u>2978</u>) and tested for β-galactosidase activity using Sigma's β-galactosidase Reporter Gene Activity Detection Kit (<u>Gal-A</u>). The data represents results obtained from 4 independent transfection experiments performed in triplicate.

Recombinant Protein Cloning and Expression

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Features & Benefits

- Efficiently transfects wide variety of cell types
- Low toxicity
- Suitable for stable and transient transfection
- Use in serum-containing or serum-free media
- Economical
- Ideal for Sf 9 insect cells

5 μl is sufficient to transfect in a 35 mm culture dish; 15 μl is sufficient in a 60 mm dish.

ESCORT™ Transfection Reagent

ESCORT liposome transfection reagent is a highly effective, low toxicity transfection reagent suitable for both transient and stable transfection in either full serum or serum-free medium. It is a 1:1 (w/w) liposome formulation of the cationic lipid N-[1-(2,3-dioleoyloxy)propyl]-N,N,N-trimethylammonium chloride (DOTAP) and dioleoyl phosphatidylethanolamine (DOPE) in 0.2 μ m filtered MES-buffered saline, pH 6.2.

Efficient transfection has been demonstrated in a wide variety of cell lines including: HeLa cells, CHO-K1, COS-7, CV-1, HEK 293, PAE and *Sf* 9 insect cells. In particular, ESCORT is a transfection reagent of choice for *Sf* 9 insect cells resulting in higher efficiencies, better cell viability and requiring less transfection reagent and less DNA compared to other insect specific transfection reagents.

Product Code	Description	Size
<u>E 9770</u>	ESCORT™ Transfection Reagent	0.25 ml
		0.5 ml

Features & Benefits

- High efficiencies
- Transfects a wide spectrum of cells
- Works well in serum

Sufficient for 150 transfections (2 μg of DNA/dish) 1.5 ml sufficient for 300 μg DNA transfection

ESCORT™ II Transfection Reagent

ESCORT II is a unique formulation of the neutral lipid dioleoyl phosphatidylethanolamine (DOPE) and a proprietary cationic lipid. Transfected cell types include: HeLa S3, BHK-21, 293, CHO-K1, MDCK, CV-1, NIH3T3, COS-1, B16-F0, COS-7, PC-12, HepG2 and K562.

Through the use of an optimized DNA diluent, ESCORT II delivers higher expression levels than other commercially available products over a broad spectrum of cells and in the presence of serum.

Product Code	Description	Size
<u>L 6037</u>	ESCORT™ II Transfection Reagent	0.75 ml
		1.5 ml

Features & Benefits

- Recommended for primary cell lines
- Reagent of choice for PC-12
- Low toxicity

Do not freeze.

1 ml sufficient for 250-1000 transfections

ESCORT™ III Transfection Reagent

Supplied as a sterile suspension in water at a concentration of 1 mg/ml.

ESCORT III is a liposomal formulation of a polycationic lipid and a neutral, nontransfecting lipid compound recommended for primary cell transfections. ESCORT III has been used to successfully transfect DNA into primary cells such as: primary human keratinocytes and tracheobronchial cells, primary quail myoblasts, primary sheep tracheobronchial cells, and primary hamster and rat hepatocytes. ESCORT III has also been shown to be effective for the transfection of HepG2, COS, NIH3T3, PC-12 and Jurkat cells. No significant toxicity was observed at the concentrations used for optimal activity on the cell lines tested.

Optimal efficiencies are typically achieved using 1-4 μ g ESCORT III per μ g DNA on various cell lines tested in 35 mm dishes.

Product Code	Description	Size
<u>L 3037</u>	ESCORT™ III Transfection Reagent	1 ml

Features & Benefits

- Reagent of choice for insect cells
- Recommended for cultured cell lines
- Low toxicity

Do not freeze.

1 ml sufficient for 160-250 transfections

ESCORT™ IV Transfection Reagent

Supplied as a sterile suspension in water at a concentration of 1 mg/ml.

ESCORT IV is a liposomal formulation of a polycationic lipid and a neutral, nontransfecting lipid compound. ESCORT IV has been used successfully to transfect DNA into CHO-K1, COS-1 and NIH3T3 (in the presence of fetal bovine serum), primary keratinocytes, primary rat aortic smooth muscle, primary human lung alveolar cells, ECV304 (HUVEC), 293, C2C12, and astrocytes. ESCORT IV is recommended for the transfection of cultured cell lines. Peak activities were achieved using 4-6 μ g ESCORT IV per μ g of DNA on the tested cell lines grown in 35 mm dishes. No significant toxicity was observed at the concentrations used for optimal activity on the cell lines tested.

Product Code	Description	Size
<u>L 3287</u>	ESCORT™ IV Transfection Reagent	1 ml

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ESCORT™ V Reagent

The ESCORT V reagent is a specially processed polyethylenimine (PEI) at a concentration of 1.3 mg/ml. It has been extensively tested on a wide variety of cell lines and found to be highly efficient in many cell types including: CHO, BHK-21, HeLa, HEK, HEK-293T, Vero, F9, Jurkat, PC-12, COS-1, COS-7, NIH3T3, and L929. ESCORT V pyrogen free transfection reagent works effectively in the presence of serum and in serum-free mediums. It is non-toxic at the effective concentrations for all cell lines tested. The transfection procedure is easily scalable and can be used for high-throughput assays using 96-well plates.

Product Code	Description	Pkg. Size
<u>E 9778</u>	ESCORT™ V Reagent	1.5 ml

ESCORT™ V Kit-Enhanced

Sigma's new ESCORT V Kit is an alternative for cell lines that provide low transfection yield. ESCORT V is a specially processed polyethylenimine (PEI) at a concentration of 1.3 mg/ml. In conjunction with the enhancer, transfected gene expression can be enhanced as much as 20-fold. It has been tested on a variety of cell lines and found to be highly efficient in many cell types including: CHO, HeLa, F9, C2/C12 and L929

Product Code	Description	Size
<u>E 1029</u>	ESCORT™ V Kit-Enhanced	0.4 ml

NeuroPorter™ Transfection Kit

NeuroPorter[™] is a unique cationic lipid that has been specifically optimized for the transfection of primary neurons, neuronal cell lines, and glial cells. Transfection with NeuroPorter[™] results in high efficiencies, minimal toxicity, and is compatible with serum containing media. It is also suitable for transfection of cultured and primary cells. Use of NeuroPorter[™] eliminates neurodegeneration and neurite withdrawal typical of calcium phosphate and electroporation methods. Each kit is suitable for 75-300 reactions, depending on the cell type.

Product Code	Description	Unit
<u>NPT01</u>	NeuroPorter™ Transfection Kit	1 kit

Note: Available only in the US and Canada.

NeuroPorter[™] is a trademark of Gene Therapy Systems, Inc.

DEAE-Dextran Transfection Kit

DEAE-dextran, positively charged at physiological pH, complexes with DNA, facilitates adhesion to cell membranes, and promotes entry of DNA into the cell. Sigma's easy-to-use kit allows you to transfect DNA conveniently into mammalian cells. This method suitable for transient transfections.

Reference

1. Ausubel, F. M., Transfection using DEAE-dextran Short Protocols in Molecular Biology 4th ed., New York, NY, USA (1999), **10**.

Product Code	Description	Size
<u>DE-DEX</u>	DEAE-dextran Transfection Kit	1 kit

Features & Benefits

- Highest efficiencies
- Transfects a wide spectrum of cells
- Lowest cytotoxicity

1.5 ml is sufficient for 140-200 transfections in a 35 mm dish

Features & Benefits

- Same as Escort V
- Enhances transfection up to 20-fold in difficult to transfect cell lines

0.4 ml is sufficient for 35-55 transfections in a 35 mm dish

Features & Benefits

- Optimized for neuronal cell lines
- Minimal toxicity
- Suitable for cultured and primary cells Sufficient for 75-300 reactions

Components

10 mg/ml DEAE-Dextran in PBS
10x Phosphate Buffered Saline

Chloroguine in PBS, 8 mM

1 kit sufficient for 40 x 100 mm dishes or 60 x 60 mm dishes

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Components		Components
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2x HEPES Buffered Saline
Molecular Biology Grade Water

Calcium Chloride

Sufficient for 300 transfections (3.5 cm dishes) Sufficient for 40 transfections

(10 cm dishes)

Features & Benefits

- Ready-to-use
- As little as 10 ng of plasmid DNA required
- Flexibility for any strain of yeast
- Sufficient for >100 standard transformations

Components

Components

96-well plate

FITC-Antibody Control

β-Galactosidase Control

Control yeast plasmid DNA, pRS316

PLATE buffer

Transformation buffer

Yeast synthetic media supplement without uracil Carrier DNA from salmon testes

Composition: 20 mM DOTAP:Cholesterol (1:1 molar ratio) extruded liposomes in 5% glucose.

Sufficient for 6-10 injections

BioPORTER Reagent Coated Tubes

Contains 24 tubes of BioPORTER,

sufficient for 24 reactions in a 6-well

plate/35 mm dish or 240 reactions in a

Calcium Phosphate Transfection Kit

This procedure is based on slow mixing of HEPES-buffered saline containing sodium phosphate with a $CaCl_2$ solution containing the DNA. A DNA–calcium phosphate coprecipitate forms which adheres to the cell surface and is taken up by the cell, presumably by endocytosis. This method suitable for transient transfections.

References

- Graham, F.L. and Van der Eb, A.J., A new technique for the assay of infectivity of human adenovirus 5 DNA Virology 52, 456-467 (1973).
- Wigler, MJ., et al., Biochemical transfer of single-copy eucaryotic genes using total cellular DNA as donor Cell 14, 725-731 (1978).

Product Code	Description	Size
<u>CA-PHOS</u>	Calcium Phosphate Transfection Kit	1 kit

Yeast Transformation Kit

Contains all necessary reagents and controls for efficient transformation of yeast by the lithium acetate method. The lithium acetate method is documented by a long, successful publication history as a highly efficient and low cost method of transformation. Convenient, flexible and sensitive, positive transformants can be obtained with as little as 10 ng of DNA; the optimal efficiency is in the 0.1-3 μ g range. The Yeast Transformation Kit contains all necessary reagents and is ready-to-use with no mixing necessary. Offers complete flexibility so any strain of yeast can be used.

References

Ito, H., et al., Transformation of intact yeast cells treated with alkali cations. J. Bacteriol. **153**, 163-168 (1983).
Hill, J., et al., DMSO-enhanced whole cell yeast transformation Nucl. Acids Res. **19**, 5791 (1991).
Gietz, D., et al., Improved method for high efficiency transformation of yeast Nucl. Acids Res. **20**, 1425 (1992).
Elble, R., A simple efficient procedure for transformation of yeast Biotechniques **13**, 18-20 (1992).

Product Code	Description	Size
<u>YEAST-1</u>	Yeast Transformation Kit	1 kit

in vivo Liposome Transfection Reagent

This reagent provides a method to transfect animal cells for study of gene expression *in vivo*. When DNA is mixed with the DOTAP:cholesterol (1:1 molar ratio) extruded liposomes, it becomes condensed in the liposome interior. The liposomes are stable at high concentration and with a high concentration of DNA, allowing large quantities of DNA to be delivered *in vivo*. Transfection and gene expression efficiency is correspondingly high, for example, in mice.¹

Reference

1. Smyth-Templeton, N. et al., Nature Biotechnology, 15, 647, (1997).

Product Code	Description	Size
<u>L 6910</u>	in vivo Liposome Transfection Reagent	0.4 ml

BioPORTER® Quikease™ Protein Delivery Kit

The BioPORTER Quikease Protein Delivery Kit contains a unique lipid-based formulation that allows for the intracellular delivery of proteins, peptides, and bioactive molecules such as enzymes and antibodies, into a broad range of cell types. The BioPORTER Reagent is easy to use, shows very low toxicity, and is more economical than either microinjection or electroporation for delivering biologically active proteins into living cells. The specific formulation of BioPORTER can deliver various molecules over a broad range of cell types in serum-free conditions. Molecule delivery is fast and reaches optimal levels after 4 hours of incubation.

Product Code	Description	Size
BPQ24	BioPORTER Quikease Protein Delivery Kit	1 kit

Available only in the US and Canada.

BioPORTER[®] Quikease[™] is a trademark of Gene Therapy Systems, Inc.

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