

## Hieff Trans™ Polyethylenimine Linear (PEI) MW40000(Rapid Dissolving)

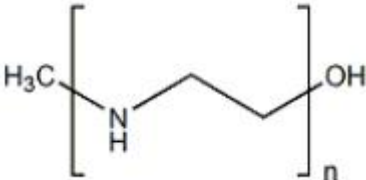
### Product description

PEI 40000 is a highly cationic polymer with a molecular weight of 40,000. It readily binds to negatively charged nucleic acids to form complexes, facilitating their entry into cells. As a transient transfection reagent, PEI 40000 features low cytotoxicity and high transfection efficiency, achieving superior gene expression levels in cell lines such as HEK293 and CHO. It has been extensively validated for a wide variety of cell lines, including HEK-293, HEK293T, CHO-K1, COS-1, COS-7, NIH/3T3, Sf9, HepG2, and HeLa, yielding transfection efficiencies of up to 80%–90%.

Compared to PEI 25000 transfection reagent, PEI 40000 offers several distinct advantages. These include: 1. PEI 40000 is highly soluble and can be dissolved directly in water, whereas PEI 25000 requires acidification of the water to aid dissolution, followed by neutralization with NaOH; 2. PEI 40000 is more convenient to handle and delivers better transfection performance than PEI 25000; 3. PEI 25000 contains 4%–11% propionyl residues, which can hinder the binding of the polymer backbone to DNA. In contrast, PEI 40000 features a fully depropionylated structure, ensuring consistently high and reliable performance.

This product is formulated for rapid dissolution, allowing for quick dissolving and convenient preparation.

### Specifications

|                        |                                                                                     |
|------------------------|-------------------------------------------------------------------------------------|
| Cat.No.                | 40816ES01 / 40816ES02 / 40816ES03 / 40816ES10                                       |
| Size                   | 5 mg / 100 mg / 1 g / 10 g                                                          |
| English Name           | Polyethylenimine Linear (PEI) MW40000                                               |
| CAS No.                | 49533-93-7                                                                          |
| Molecular formula      | $(\text{CH}_2\text{CH}_2\text{NH})_n$                                               |
| Molecular weight       | 40,000                                                                              |
| Solubility             | Soluble in water,insoluble in organic solvents:benzene,ether and acetone            |
| Structure              |  |
| Form                   | White or off-white solid                                                            |
| Serum Compatible       | Yes                                                                                 |
| Cell Type              | Established Cell Lines                                                              |
| Sample Type            | Plasmid DNA                                                                         |
| Transfection Technique | PEI-Based Transfection                                                              |

## Components

| Name                                                                    | 40816ES01 | 40816ES02 | 40816ES03 | 40816ES10 |
|-------------------------------------------------------------------------|-----------|-----------|-----------|-----------|
| Hieff Trans™ Polyethylenimine Linear(PEI)<br>MW40000 (Rapid Dissolving) | 5 mg      | 100 mg    | 1 g       | 10 g      |

## Storage

This product should be stored at room temperature for 2 years. The stock solution is stored at 2-8 °C for 3 months.

## Instructions

### I.Storage liquid configuration(1 mg/mL)

#### 1. Material

PEI 40000,Milli-Q water/water for injection (WFI)or similar bio-grade water,1 mol/L sodium hydroxide (NaOH), disposable 0.1~0.2 µm PES vacuum sterile filter, sterile HDPE or poly acrylic storage bottle.

#### 2. Configure the storage solution (1 mg/mL)

2.1 In a 1 L glass beaker, add 1 g of PEI 40000 powder to 900 mL of Mill-Q ultrapure water or other equivalent biological water, stir evenly on a magnetic stirrer, and generate small vortices.

2.2 Wait until PEI 40000 is completely dissolved (usually less than 5 mins);

2.3 Add 1 mol/L sodium hydroxide solution dropwise while stirring to adjust the pH to 6.90~7.10.

**【Note】** : If the pH value is >7.10, please use hydrochloric acid to adjust the pH value to 6.90~7.10.

2.4 Transfer the solution to a graduated cylinder, and add water to make up to 1 L.

2.5 Filter and sterilize with a disposable 0.1~0.2 µm PES vacuum filter to obtain a stock solution of 1 mg/mL.

2.6 Aliquot as needed and store at 2-8 °C, stable for 3 months.

### II. Adherent Cell Transfection Protocol (Using 6-Well Plate as an Example)

1. Inoculate cells: In order to improve the transfection efficiency, it is recommended to inoculate cells one day before transfection, and the cell density should be 70%~80%.

2. Prepare DNA-PEI complexes: Prepare DNA-PEI nucleic acid-transfection reagent complexes according to the following system:

2.1 For each well of cells, dilute 2 µg of target DNA with 100 µL of serum-free medium, and mix thoroughly to form a DNA dilution solution.

**【Note】** : Opti-MEM or ddH<sub>2</sub>O is recommended for serum-free diluents.

2.2 Immediately add 4 µL of PEI40000 Transfection Reagent to 100 µL of DNA Diluent, vortex for 10 seconds, and mix well.

2.3 Incubate at room temperature for 10-15 mins to form a DNA-PEI cationic nucleic acid transfection reagent complex.

#### 3. Transfect cells

3.1 During complex formation, remove cell growth medium and add 2 mL of fresh prewarmed complete medium to each well.

3.2 Add 100 µL of DNA-PEI nucleic acid-PEI complex directly to the cells, shake the culture plate, and mix gently.

3.3 Culture in a 37 °C, 5% CO<sub>2</sub> incubator, and the expression of the transfected gene can be detected as soon as 5 hours after transfection. Please determine the appropriate detection time by yourself.

The amount of transfection in different cell culture vessels (for reference only):

**Table 1. Cell Transfection Parameters (For Reference Only)**

| Culture vessel          | Surface area per, well*(cm <sup>2</sup> ) | DNA(μg) | Transfection reagent(μL) | Vol.of dilution medium(μL)** | Vol of plating medium |
|-------------------------|-------------------------------------------|---------|--------------------------|------------------------------|-----------------------|
| 96-well                 | 0.3                                       | 0.1     | 0.1                      | 10                           | 100 μL                |
| 48-well                 | 0.7                                       | 0.2     | 0.3                      | 20                           | 200 μL                |
| 24-well                 | 1.9                                       | 0.5     | 1                        | 50                           | 500 μL                |
| 12-well                 | 3.8                                       | 1       | 2                        | 50                           | 1 mL                  |
| 6-well                  | 10                                        | 2       | 4                        | 100                          | 2 mL                  |
| Flask 25cm <sup>2</sup> | 21                                        | 4       | 8                        | 200                          | 4 mL                  |
| Flask 75cm <sup>2</sup> | 58                                        | 10      | 20                       | 500                          | 10 mL                 |

**[Note]** : \*.The surface area of cell culture plates provided by different manufacturers may vary.

\*\*.\*Volume of medium used to dilute DNA.

### III.Suspension Cell Transfection Protocol (Using a 1L System as an Example)

#### 1) Cell Seeding

Select an appropriate seeding density based on cell status. It is recommended to seed cells at a density of 1–1.5 × 10<sup>6</sup> cells/mL, aiming for a cell density of 2–3 × 10<sup>6</sup> cells/mL at the time of transfection the following day.

#### 2) Preparation of DNA-Transfection Reagent Complexes

- Plasmid-to-Reagent Ratio: The recommended ratio of plasmid (μg) to reagent (μL) ranges from 1:0.5 to 1:3.
- Plasmid Dilution: Dilute 2 mg of plasmid in 50 mL of serum-free medium and mix gently.
- Reagent Dilution: Dilute 4 mL of transfection reagent in 50 mL of serum-free medium and mix gently.
- Complex Formation: Add the diluted transfection reagent to the diluted plasmid solution. Mix gently by vortexing, then incubate at room temperature for 10–20 minutes before use.

#### 3) Cell Transfection

- Directly add the prepared DNA-transfection reagent complexes to the 1 L cell suspension. Shake the culture flask to mix gently.
- Incubate the cells in a 37°C, 5% CO<sub>2</sub> incubator for 24–72 hours before proceeding with detection and analysis.

### Notes

- This product is polyethylenimine in its hydrochloride salt form and has a tendency to agglomerate (form clumps).
- For most cell types, using 3.0 μL of PEI 40000 transfection reagent per 1 μg of DNA yields high transfection efficiency.
- This product is for research use only.
- For your safety and health, please wear a lab coat and disposable gloves when handling this product.