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Helios Oligo dT

1. Basic product information

Helios Oligo dT affinity resin is a new type of high rigid polymer resin, which is mainly used for the separation and purification of mRNA. Helios Oligo dT is based on polystyrene, and the surface is covered with a large number of hydroxyl groups. The functionalised poly dT group can efficiently capture mRNA by base pairing with the poly-A tail of mRNA and improve production efficiency. Resin has high selectivity and extremely low non-specific adsorption.

2. Chromatography resin parameters

Resin type	Affinity chromatography
Matrix	Polystyrene
Functional group	dT-20 mer
Median particle size	50 µm
Ligand density	0.27 umol dT/ml
Flow rate	1000 cm/h
Maximum working pressure	100 bar
Compression factor	1.06
Working temperature	2–65°C

3. Chemical resistance

pH stability*	2–13
Ionic strength	0 to 5 M common salt solutions
Common solvent	Water, 0~100% ethanol, acetonitrile, 2M acetic acid, 1M hydrochloric acid and other common organic solvents
Avoid	Strong oxidising agents (such as hypochlorite), oxidising acids (such as nitric acid), strong reducing agents (such as sulfite), acetone, tetrahydrofuran or benzyl alcohol

** The physical and chemical properties and functions of the chromatographic resin have no obvious change after being placed in an environment of 40°C and pH 3–13 for 7 days.*

4. Method of use

4.1 Chromatography conditions

(1) Buffer selection: use common buffer solution for mRNA purification; 0.5 M NaOH, 2 M MgCl2, 20 mM EDTA
(2) Column packing: according to the packing compression factor, the homogenate ratio is 50–70%, the inner diameter of the chromatography column and the actual demand, measure the packing. Generally, the packing needs to settle for 4 hours to read the volume. Pack the column with 0.1 M NaCl or equilibration buffer. Ensured that each material is at working temperature. The buffer used and the filler need to be degassed before use, and the filler needs to be poured into the column packer or column tube all at once to avoid multiple feedings.

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Helios Oligo dT has good rigidity and can be packed in low-pressure glass columns and high-pressure stainless steel columns. The recommended packing compressibility factor range is 1.06–1.5.
For smaller diameter columns (≤1 cm), we recommend packing the column at a flow rate of 1000–2000 cm/h; or use a flow rate of at least 50% of the maximum operating flow rate of the actual operating system. Generally, the pressure column is at least 3 CV. After the chromatographic column is packed, wash the column bed with the packing solution (2–3 CV) until the flow rate is the actual flow rate to stabilise the column bed. To avoid damage to the column bed, the pressure during operation should not exceed 80% of the packing pressure.

(3) Column efficiency determination
Flow rate: actual operating flow rate (100–300 cm/h)
Mobile phase: 0.1M NaCl
Sample: 1M NaCl
Loading volume: 2% column volume
Remarks: generally, equilibrate at least 4 CV with mobile phase before loading.

4.2 Chromatography steps

(1) Equilibration: equilibrate the column with 3 to 4 CV equilibration buffer; commonly used buffer is 10 mM Tris-HCl, 0.5 M NaCl, 1 mM EDTA, pH 7.4.
(2) Sample pretreatment: the mRNA sample was mixed with equilibration buffer, and the commonly used buffer was 10 mM Tris HCl, 0.5M NaCl, 1 mM EDTA, pH 7.4. If denaturation is required, heat the sample in a water bath at 65°C for 10–15 minutes, and then place the sample on ice immediately.
(3) Sample loading: load the sample at a flow rate of 50–150 cm/h.
(3) Rinse: first, rinse with equilibration buffer 10 mM Tris-HCl, 0.5M NaCl, 1 mM EDTA, pH 7.4, 2–3 CV.
Then wash with 10 mM Tris HCl, 100–300 mM NaCl, 1 mM EDTA, pH 7.4, for 3–5 CV until the conductivity goes flat.
(4) Elution: generally, bound mRNA is eluted with 3–5 CV of 10 mM Tris HCl, 1 mM EDTA, pH 7.4; or 3–5 CV of ultrapure water for elution.
Remarks: increasing the temperature to 65°C can effectively increase the elution rate.
(5) Regeneration: the regeneration buffer needs to be determined according to the purity and composition of the sample. Commonly used is ultrapure water, 3–5 CV. For impurities with strong binding, wash with 20–30% ethanol solution containing 0.5 M NaOH, 3–5 CV.

5. Cleaning and sterilisation

Contaminants accumulate on the column as the number of uses of the chromatography resin increases. Determine the frequency of cleaning-in-place (CIP) according to the degree of contamination of the chromatography resin (if the contamination is considerable, CIP is recommended after each use to ensure repeatability of results and to prolong the working life of the chromatography resin). Recommended cleaning conditions are as follows:
Wash with 3–5 CV of 0.1M NaOH first, then wash with equilibrium buffer solution for 3–5 CV until the conductivity remains unchanged.

6. Storage

Keep the unopened chromatography resin in the original container and store at 2~8°C in a well-ventilated, dry and clean place. Do not freeze. Wash the used column with 2–3 CV of 20% ethanol solution and store at 2~8°C.

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7. Destruction and recycling

Since chromatography resin is difficult to degrade in nature, it is recommended that the waste chromatography resin is incinerated to protect the environment. For chromatography resin that has been in contact with biologically active samples such as viruses and blood, follow the local biosafety requirements before destroying or disposing of it.

8. Packing method

Detailed information on resin packaging is available on request. Please contact your local distributor.

9. Ordering information

Product name: Helios Oligo dT

Product Cat. No	Package
252-00025	25 ml
252-00100	100 ml
252-00500	500 ml
252-01000	1 L
252-05000	5 L
252-10000	10 L
252-20000	20 L