Magrose Beads COOH (10-30 μm)

Introduction

TargetMol's Magrose Beads COOH (10-30 μm) are a new type of functionalized magnetic microspheres formed by compounding agarose, the most ideal natural polymer material for protein separation and purification, with superparamagnetic materials. Compare to traditional magnetic beads, Magrose beads offer rapid magnetic responsiveness while maintaining excellent dispersibility, extremely low nonspecific adsorption, and abundant binding sites. These features allow for convenient and efficient high-capacity conjugation with a variety of biological ligands (proteins, peptides, oligonucleotides, and drug molecules). With exceptionally high target-binding capacity, making Magrose beads the material of choice for separation and purification applications.

Product Features

- High carboxyl group density (Magrose COOH group~1000 μmol/g) ensures strong target binding capacity with minimal nonspecific adsorption.
- Uniformly dispersed magnetic beads with good handling, capable of maintaining stable magnetic responsiveness and good resuspension.
- Good physicochemical stability and batch-to-batch consistency, with a coefficient of variation (CV) for carboxyl group content below 5%, ensuring stable and reliable experimental results.
- High binding capacity for target molecules with low nonspecific adsorption, specially designed for separation and purification applications.

Components

Product Name	C0085	C0086	C0087
Average Particle Size	10-30 μm	10-30 μm，Ultra-suspension	30-150 μm
Surface Functional Group	~60 μmol/mL gel	~60 μmol/mL gel	≥120 μmol/mL gel
Magnetic Core	Fe_3O_4		
Shell Material	Agarose		
Magnetic Type	Superparamagnetic		
Storage Buffer	20% ethanol		

Applications

- Protein purification: The functional groups on the surface of the magnetic beads enable efficient purification of target proteins, significantly streamlining protein research and production workflows.
- Immunoassays: Magnetic beads can be conjugated with antibodies to capture and detect specific antigens, significantly enhances the sensitivity and specificity of immunoassays.
- Drug screening and delivery: Magnetic beads can be applied in high-throughput drug screening to identify potential drug candidates. They can also act as drug delivery carriers, allowing precise delivery of therapeutics to target sites under magnetic field control.
- High efficiency and versatility, mainly in the field of separation and purification.

Instructions

Coupling of Magrose Beads with Biomolecules (Example: Protein A)

1. Magnetic Bead Pretreatment

1) Vortex the Magrose Beads COOH thoroughly to ensure full dispersion. Pipette 100 µL of bead suspension into a 1 mL EP tube.
2) Place the tube on a magnetic separator for 1 minute, then perfome magnetic separation. Remove the supernatant and take the tube off the magnet.
3) Add 200 µL of MEST solution (100 mM MES, pH 5.0, 0.05% Tween 20) and wash the beads 2 times, removing the supernatant after each magnetic separation.

2. Activation of Carboxyl Groups on Bead Surface

1) Quickly add 100 µL of freshly prepared EDC solution (10 mg/mL, prepared using the above MEST buffer as the dispersant) and 100 µL of NHS solution (10 mg/mL, also prepared using the above MEST buffer as the dispersant) to the EP tube. Vortex thoroughly to fully resuspend the magnetic beads.
2) Incubate at 25 °C for 30 minutes. Keep the beads in suspension during the reaction using a vertical rotator or equivalent mixing device.

Note: After this treatment, the carboxyl groups on the surface of the magnetic beads are successfully activated and ready for covalent coupling with biomolecules containing primary amine groups. Since the activated state is unstable, it is recommended to proceed with the coupling reaction immediately to ensure high efficiency and successful conjugation.

3. Covalent Coupling of Beads with Biomolecular Ligands

1) Perform magnetic separation and discard the supernatant. Add 50–200 µg of the biomolecular ligand to the EP tube. The amount, concentration, and buffer system should be optimized based on experimental requirements.

Note: Recommended ligand buffers include: 100 mM MES buffer, pH 4.8; 200 mM sodium bicarbonate buffer, pH 8.3; 50 mM borate buffer, pH 8.5; 100 mM phosphate buffer; 100 mM sodium chloride solution, pH 7.4. 0.05% Tween 20 may be added to the buffer to improve bead dispersion. Avoid the presence of reagents containing primary amine groups in the buffer, except for the intended biomolecular ligand.

2) Gently mix the reaction. Incubate at 25 °C for 2 hours, or incubate at 25 °C for 1 hour followed by overnight incubation at 4 °C. Keep the beads suspended during coupling, using a vertical rotator or similar mixing device.

4. Blocking After Coupling

1) Perform magnetic separation and discard the supernatant. Add 200 µL of PBST solution (pH 7.2, containing 1% BSA) to resuspend the beads. Sonication may be used if necessary.
2) Incubate at 25 °C for 1 hour to block nonspecific binding sites on the bead surface. Keep the beads suspended during incubation using a vertical rotator or similar mixing device.

5. Storage

1) Perform magnetic separation and discard the supernatant. Wash the beads 3 times with 200 µL of PBS buffer (pH 7.2) or a designated storage buffer.
2) Resuspend the beads in storage buffer at the desired concentration. Store at 4 °C. If long-term storage is needed, 0.02% (w/v) sodium azide (NaN_3) can be added to inhibit microbial growth.

Storage

Store at 4℃ for 2 years.

Precautions

1. Avoid freezing, drying, or high-speed centrifugation of the magnetic beads.
2. To minimize bead loss, magnetic separation time should be no less than 1 minute each time.

3. Before removing beads from the tube, ensure they are evenly suspended by gentle shaking. Handle gently to prevent the bubbles.
4. It is recommended to use high-quality pipette tips and reaction tubes to reduce bead and solution loss due to surface adhesion.
5. If the solution is too viscous to allow proper resuspension of the magnetic beads by inverting the centrifuge tube, pipetting up and down or briefly vortexing can be used to fully resuspend the beads.
6. If needed, magnetic beads can be washed 2–3 times with purified water or buffer using magnetic separation to remove ethanol from the storage solution.
7. These beads are not pre-activated and must be activated according to the recommended procedure before performing coupling reactions.
8. The product is for R&D use only, not for diagnostic procedures, food, drug, household or other uses.
9. Please wear a lab coat and disposable gloves.