CCN Bio
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STag™ Magnetic Beads

1. Product Description

The **magnetic agarose bead series** consists of superparamagnetic agarose microspheres featuring rapid magnetic responsiveness, abundant hydroxyl functional groups, and a narrow particle size distribution. Under appropriate chemical activation conditions, these beads enable covalent coupling of biological ligands such as peptides, proteins, antibodies, and oligonucleotides, making them valuable tools for biomedical and molecular biology research. The particle size of magnetic beads is approximately **30–100 μm**. This optimized particle size distribution is well suited for biological separation and purification applications.

CCN Bio STag™ Magnetic Beads are designed for the purification of Strep-tag II and Twin Strep-tag fusion proteins expressed in a variety of systems, including baculovirus, mammalian cells, yeast, and bacteria.

Strep-tag II is a short affinity tag consisting of eight amino acids (Trp-Ser-His-Pro-Gln-Phe-Glu-Lys). Due to its small size, it has minimal impact on the structure and function of recombinant proteins and generally does not require removal after purification.

Twin Strep-tag is an enhanced version containing two sequential Strep-tag II motifs connected by a linker peptide. This design provides significantly higher affinity while retaining the mild and rapid purification characteristics of the original Strep-tag II system.

STag™ is a proprietary streptavidin-derived affinity ligand immobilized on magnetic agarose beads. The ligand enables efficient affinity purification of tagged proteins under physiological conditions, helping preserve protein structure, activity, and biological function.

Table 1. CCN Bio STag™ Magnetic Beads Specifications

Parameter	Specification
Matrix	Magnetic Agarose Beads
Ligand	STag™ Affinity Ligand
Binding Capacity	≥4 mg Twin Strep-tag Protein / mL Beads
Particle Size	30–100 μm
Storage Buffer	1× PBS containing 20% Ethanol
Bead Content	Beads occupy approximately 20% of suspension volume
Storage Temperature	2–8°C

2. Instructions for Use

2.1 Buffer Preparation

It is recommended that all water and buffers be filtered through a **0.22 μm or 0.45 μm membrane filter** before use.

Equilibration/Wash Buffer

Option 1

100 mM Tris-HCl
150 mM NaCl
1 mM EDTA
pH 8.0

Option 2 (PBS)

20 mM Sodium Phosphate
280 mM NaCl
6 mM Potassium Chloride
pH 7.4

Elution Buffer

Equilibration buffer supplemented with:
1–5 mM D-Biotin

Regeneration Solution

100 mM NaOH

2.2 Sample Preparation

Before loading, samples should be centrifuged or filtered through a **0.22 μm or 0.45 μm membrane filter** to remove particulates, improve purification efficiency, and prevent clogging.

2.3 Purification Procedure

1) Bead Preparation

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Invert the bead suspension several times to ensure complete mixing. Transfer the desired volume of bead suspension into a centrifuge tube.

Place the tube on a magnetic separator for approximately **1 minute** until the suspension becomes clear. Carefully remove and discard the supernatant.

2) Bead Equilibration

Remove the tube from the magnetic separator and add an equal volume of equilibration buffer.

Resuspend the beads by pipetting up and down 5–10 times. Place the tube on the magnetic separator for approximately 1 minute until the solution clears, then remove and discard the supernatant.

Repeat this wash step **twice**.

3) Binding

Add the prepared sample to the equilibrated beads and mix thoroughly.

Incubate on a rotator or mixer at room temperature for **at least 30 minutes**. The incubation time may be adjusted depending on binding efficiency requirements.

4) Washing

Place the tube on the magnetic separator for approximately 1 minute until the suspension clears.

Collect the supernatant if desired for analysis.

Add wash buffer equal to approximately **five bead suspension volumes** and resuspend thoroughly by pipetting 5–10 times.

Separate magnetically and remove the supernatant.

Repeat the washing procedure **at least two additional times**.

5) Elution

Add **3–5 bead volumes** of elution buffer and mix thoroughly.

Incubate at room temperature for **5 minutes**.

Place the tube on the magnetic separator and collect the supernatant containing the purified protein.

Elution may be repeated up to two additional times if necessary.

Denaturing Elution

Remove the tube from the magnetic separator and add an equal volume of **2× SDS-PAGE Loading Buffer**.

Mix thoroughly and heat at **95°C for 10 minutes**.

Separate the beads magnetically and collect the supernatant for SDS-PAGE or Western blot analysis.

Note: Beads subjected to denaturing elution cannot be reused.

3. Bead Regeneration and Cleaning

For bead regeneration, perform the following sequence:

3 bead volumes of deionized water

5–10 bead volumes of 0.1 M NaOH

3 bead volumes of deionized water

Store in 1× PBS containing 20% ethanol at 2–8°C

4. Ordering Information

Product	Cat. No.	Bead volume
CCN Bio STag™ Magnetic Beads 5 ml	CCNSTM0001	1 mL
CCN Bio STag™ Magnetic Beads 10 ml	CCNSTM0002	2 mL
CCN Bio STag™ Magnetic Beads 25 ml	CCNSTM0005	5 mL
CCN Bio STag™ Magnetic Beads 125 ml	CCNSTM0025	25 mL
CCN Bio STag™ Magnetic Beads 500 ml	CCNSTM0100	100 mL

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