

Anti-GFP VHH Agarose Beads

Product Information

Catalog Number: KTSM1301

Volume: 500 μ L (20 times, 50% anti-GFP VHH coated agarose beads)

Storage condition: 4°C for 12 months

Product Description

Fluorescent protein GFP exhibits bright green fluorescence when exposed to ultraviolet light and is frequently used as reporter and fusion tag. VHH (variable domain of heavy chain of heavy chain-only antibodies) is 4 nm in length, 2.5 nm in width, and has a molecular weight of 15 kDa, only one tenth the size of conventional antibodies. VHH exhibits high specificity and affinity and outperforms conventional antibodies in many aspects, such as high stability, great specificity and easy and feasible development process. Anti-GFP VHH Agarose Beads are agarose beads covalently coupled with VHH antibodies acquiring high specificity and affinity for GFP. These beads can efficiently capture and separate GFP and GFP tagged proteins, alongside with the associated proteins from cell extracts of mammal, plant, bacteria, yeast, insect, and other organisms.

Advantages

- No heavy & light antibody chains
- Consistent and reproducible results
- Extraordinary binding, even under harsh conditions
- Short incubation time (1-2 hours)
- Animal-free production

Application

Immunoprecipitation (IP), co-immunoprecipitation (CoIP), chromatin immunoprecipitation (CHIP), RNA-binding protein immunoprecipitation (RIP), Mass Spectrometry (MS).

Beads Property

Beads size: ~45 μm (7.5% cross-linked agarose beads)

Storage buffer: 1XPBS, 0.03% sodium azide, 50% glycerol

Binding capacity: 10 μL slurry binds about 18 μg of recombinant GFP.

Specificity: Selectively recognizes GFP, mEGFP, superfolder GFP and most common CFP and YFP variants.

Recommended Buffers

Buffer	Composition
Lysis buffer	50 mM Tris-HCl (pH 7.5); 150 mM NaCl; 1% Triton X-100; 1 mM EDTA
RIPA buffer	10 mM Tris-HCl (pH 7.5); 150 mM NaCl; 0.5 mM EDTA; 0.1% SDS; 1% Triton X-100; 1% deoxycholate
Dilution /Wash buffer	50 mM Tris-HCl (pH 7.5); 150 mM NaCl; 1 mM EDTA
SDS loading buffer	120 mM Tris-HCl (pH 6.8); 20% glycerol; 4% SDS; 0.04% bromophenol blue; 10% β -mercaptoethanol
Glycine - elution buffer	0.2 M glycine (pH 2.0)
Neutralization buffer	1 M Tris (pH 10.4)

Note: For yeast, plant, insect, or bacteria cell extracts, use an equally effective amount of cytolysis buffer.

Working Procedures

Harvest Cells

For co-immunoprecipitation, 10^6 - 10^7 mammalian cells expressing GFP fusion protein (about one 10 cm dish) are required.

- Gently remove cell growth medium by aspiration.
- Wash cells twice with 1 mL pre-chilled PBS.
- Collect the adherent cells using cell scraper or tryptic digestion,
- Transferred to centrifuge tubes, and centrifuge at 1,200 g for 3 - 5 min
- Discard the supernatant, resuspend cells with prechilled 1XPBS
- Repeat cell washing twice.

Cell Lysis

- a. For cytoplasmic proteins, resuspend cells with 500 μ L of pre-chilled lysis buffer.
Note: Make sure protease inhibitors and 1 mM PMSF are added.
For nuclear proteins: add 1 mg/mL DNase and 2.5 mM MgCl₂ to RIPA buffer (with protease inhibitor and 1mM PMSF)
- b. Place centrifuge tubes on ice for 30 - 40 min, and resuspend cells every 10 min.
- c. Centrifuge at 4°C and 12,000 g for 10 min, transfer the supernatant into a prechilled new centrifuge tube with 300 μ L dilution buffer (1X PBS), discard precipitation (if required, keep 50 μ L lysate for further analysis)
Note: the cell lysate collected at this point should be stored at -80°C.
Optional: Add 1mM PMSF and protease inhibitor.

Beads Equilibration

- a. Vortex Anti-GFP VHH Agarose Beads, and transfer 25 μ L beads suspension into a 1.5 mL centrifuge tube;
- b. Add 500 μ L prechilled dilution buffer [1x PBST (0.05% Tween-20)];
- c. Centrifuge at 4°C and 1,200 g for 3 min, and remove the supernatant, and repeat step b) and c) twice.

Protein Binding

- a. Add protein extracts (from **Cell Lysis** step) to the equilibrated Anti-GFP VHH Agarose Beads, and keep the tube at 4°C and upside down for 1 - 2 hours;
- b. Centrifuge at 4°C and 1,200 g for 3 min, remove supernatant.

Washing

- a. Add 500 μ L dilution buffer (or 1 mL 1x PBST) to resuspend the beads;
- b. Centrifuge at 4°C and 1,200 g for 3 min, and remove the supernatant, and repeat step a) and b) 2 - 5 times.
Optional: Increase salt concentration to 500 mM in the second washing

Protein Elution

- a. Add 100 μ L SDS Loading Buffer to resuspend the beads and boil at 95°C for 10 min to denature and separate GFP-fusion proteins from the beads.
- b. Boil at 95°C for 10 min to separate beads from the immunoprecipitation complex.
- c. Centrifuge at 4°C and 1,200g for 2 min, use the supernatant for SDS-PAGE analysis.

Alternative Elution Procedure

- a. Resuspend beads with 50 μ L elution buffer (0.2 M glycine pH 2.0), incubate on ice for 30 sec.

- b. Centrifuge at 4°C and 1,200 g for 2 min.
- c. Add 5 μ L neutralizing buffer (1M Tris-base pH 10.4) to elute protein binders.

FAQs

A. Question: Can I use Anti-GFP VHH Agarose Beads to pull down EGFP- or RFP-fusion proteins and their partners?

Answer: Anti-GFP VHH Agarose Beads can pulldown EGFP- fusion proteins and their partners, but do not cross-react with RFP-fusion proteins and their partners. Anti-GFP VHH Agarose Beads selectively recognizes GFP, mEGFP, superfolder GFP and most common CFP and YFP variants. Does not cross-react with mCherry, mRFP, dsRed, mTagBFP, mTagRFP or their most common derivatives.

B. Question: Can I use an alternative Lysis Buffer with higher NaCl and NP40 concentration?

Answer: Yes, the nanobodies conjugated to Anti-GFP VHH Agarose Beads are highly stable and resistant to harsh buffer conditions.

C. Question: Can I incubate Anti-GFP VHH Agarose Beads with cell lysate at 4 °C overnight to increase binding?

Answer: Yes, despite that the binding efficiency of our Beads and GFP does not seem to increase very much over time, as our team has compared the results of 1 - 3 hr and overnight co-incubation. Therefore, in most situations, 1 hr incubation should be sufficient to achieve excellent results.

Disclaimer: Products are for life science research only. Not for use in diagnostic procedures unless otherwise indicated.