MagVigen™ DNA Select Nanoparticles

Cat # K61001

Product Description

MagVigen™ DNA Select nanoparticles are ideal for DNA purification. MagVigen™ DNA Select nanoparticles feature efficient recovery of double-stranded and single-stranded DNA. DNA products are captured by MagVigen™ DNA Select nanoparticles following a short incubation. The generated nanoparticle-oligo complex can be separated from the rest of the sample by magnet. The retained genomic material can be eluted from the nanoparticles using an elution buffer.

MagVigen™ DNA Select nanoparticles enable the purification of DNA products from salts. They can be used for PCR product clean-up, terminator dye removal, and removal of other contaminants from assay samples, e.g. cell lysate. The purified DNA products can be further analyzed by gel electrophoresis, PCR quantification and sequencing.

Product Contents

- MagVigen™ DNA Select nanoparticles
- Capture Solutions (I,II,III)
- Elution Buffer

All materials should be stored at 4°C up to 6 months.

Protocols

Materials Needed

70% ethanol

Note:

The amount of nanoparticles needed for efficient DNA capture depends on the DNA concentration in the starting material.

In general, use 0.5X-4X volume of MagVigen™ DNA Select nanoparticles per 1X volume of DNA sample.

Example: If the DNA-containing solution has 30ul volume, then use 30-120ul of MagVigen™ DNA Select nanoparticles for capture.

Important: Always resuspend nanoparticles in 1X to 4X volume of Capture Solution for 1X volume of DNA sample.

Size selection:

Capture Buffer I: Recommended for DNA >=150bp
Capture Buffer II: Recommended for DNA >=75bp
Capture Buffer III: Recommended for DNA >35bp

DNA Capture Protocol

Bind DNA

1. Remove MagVigen™ DNA Select nanoparticles from storage and bring them to room temperature.
2. Vortex MagVigen™ DNA Select nanoparticles for 10 seconds before use.

   Note: Make sure the beads are fully resuspended and well dispersed.
3. Remove 0.5X to 4X volumes of MagVigen™ DNA Select nanoparticles and put into a clean 1.5ml micro-centrifuge tube.
4. Collect MagVigen™ DNA Select nanoparticles using magnetic rack and discard the supernatant.

   Note: A clear precipitate containing dark brown colored nanoparticles should become visible on the side of the micro-centrifuge tube.
5. Resuspend the nanoparticles in Capture Solution in 1X to 4X volume.
6. Add DNA sample to the MagVigen™ DNA Select nanoparticles.
7. Vortex or pipette the reaction solution to mix thoroughly.

   Note: It is ideal not to introduce bubbles during the capture reaction.
8. Incubate the MagVigen™ DNA Select nanoparticles-DNA reaction at room temperature for 30 minutes.
9. After incubation, use the magnet rack to separate the DNA-captured nanoparticles from the solution.
10. Carefully remove the supernatant with a pipette, make sure not to disturb the DNA-captured nanoparticle pellet.

Wash DNA

11. Keeping the magnet in place, rinse the DNA-captured nanoparticle pellet by adding 100ul of freshly prepared 70% ethanol. Let stand for 30 seconds-1 minute.

    Note: Adjust the volume of ethanol as needed to sufficiently cover the DNA-captured nanoparticle pellet.
12. Remove and discard the ethanol.
13. Repeat steps 11-12, performing a total of two rinses.
14. Allow the sample to air dry at room temperature.

    Note: Time will vary depending on the reaction volume. Try not to allow pellet to over-dry and crack. This could affect the recovery.

Elute DNA

15. Elute the captured DNA from the nanoparticles by adding 20ul of the Elution Buffer.

    Note: The volume of the Elution Buffer can be adjusted as needed.
16. Gently pipette to mix well and incubate for 2 minutes at room temperature.

    Note: It is ideal not to introduce bubbles during the elution reaction.
17. Spin down a few seconds to collect the solution.
18. Place tube on magnetic rack for 1 minute to separate the nanoparticles from the eluted DNA.
19. Transfer the supernatant containing the DNA products to a clean tube. Make sure not to disturb the pellet. The purified DNA is now ready to use for subsequent evaluation.

PCR Cleanup Protocol

Bind DNA

1. Remove MagVigen™ DNA Select nanoparticles from storage and bring them to room temperature.
2. Vortex MagVigen™ DNA Select nanoparticles for 10 seconds before use.
   Note: Make sure the beads are fully resuspended and well dispersed.
3. Transfer 10µL of MagVigen™ DNA Select nanoparticles to a micro-centrifuge tube.
4. Collect MagVigen™ DNA Select nanoparticles using magnetic rack and discard the supernatant.
   Note: A clear precipitate containing dark brown colored nanoparticles should become visible on the side of the micro-centrifuge tube.
5. Resuspend the nanoparticles in 100µL of Capture Solution.
6. Add 25-50µl of PCR sample to the resuspended nanoparticles.
7. Incubate at room temperature for 30 minutes.
8. Place the sample on magnetic rack for 1 minute until a tight pellet is formed.
9. Keep the sample on magnetic rack and carefully remove and discard the supernatant.
   Note: Do not disturb the pellet during this process. Point the tip of the pipette away from the pellet.

Wash DNA.

10. Keeping the magnet in place, rinse the DNA-captured nanoparticle pellet by adding 100µl of freshly prepared 70% ethanol. Let stand for 30 seconds-1 minute.
    Note: Adjust the volume of ethanol as needed to sufficiently cover the DNA-captured nanoparticle pellet.
11. Remove and discard the ethanol.
12. Repeat steps 10-11, performing a total of two rinses.
13. Allow the sample to air dry at room temperature.
    Note: Time will vary depending on the reaction volume. Try not to allow pellet to over-dry and crack. This could affect the recovery.

Elute DNA

14. Remove the microcentrifuge tube containing the nanoparticles from the magnetic rack.
15. Add 10-50µL Elution Buffer to the tube, and pipet up and down gently to mix.
    Note: It is ideal not to introduce bubbles during the elution reaction.
    Note: The volume of the Elution Buffer can be adjusted as needed. Less Elution Buffer can be used to achieve a higher concentration of DNA.
16. Incubate at room temperature for 1 minute.
17. Spin down a few seconds to collect the solution.
18. Place tube on magnetic rack for 1 minute to separate the nanoparticles from the eluted DNA.
19. Transfer the supernatant containing the DNA products to a clean tube. Make sure not to disturb the pellet. The purified DNA is now ready to use for subsequent evaluation.

DNA Capture from blood/tissue sample

Sample Preparation

For DNA capture from blood or tissue sample, removal of proteins by phenol/chloroform extraction or other methods are recommended prior to DNA capture to prevent protein contamination.

Phenol/Chloroform Extraction:

1. Serum or tissue lysate is diluted by 1X volume of TE buffer.
2. Add 1X volume of Phenol:Chloroform:IAA (25:24:1) and vortex for 30sec.
3. Centrifuge at 13,000g for 5min.
4. Transfer the top aqueous phase to a new tube for subsequent DNA capture.

Bind DNA

5. Remove MagVigen™ DNA Select nanoparticles from storage and bring them to room temperature.
6. Vortex MagVigen™ DNA Select nanoparticles for 10 seconds before use.
7. Remove 0.5X to 4X volumes of MagVigen™ DNA Select nanoparticles and put into a clean 1.5ml micro-centrifuge tube.
8. Collect MagVigen™ DNA Select nanoparticles using magnetic rack and discard the supernatant.
   Note: A clear precipitate containing dark brown colored nanoparticles should become visible on the side of the micro-centrifuge tube.
9. Resuspend the nanoparticles in Capture Solution in 1X to 4X volume.
10. Add DNA sample to the MagVigen™ DNA Select nanoparticles.
11. Vortex or pipette the reaction solution to mix thoroughly.
    Note: It is ideal not to introduce bubbles during the capture reaction.
12. Incubate the MagVigen™ DNA Select nanoparticles-DNA reaction at room temperature for 30 minutes.
13. After incubation, use the magnet rack to separate the DNA-captured nanoparticles from the solution.
14. Carefully remove the supernatant with a pipette, make sure not to disturb the DNA-captured nanoparticle pellet.

Wash DNA

15. Keeping the magnet in place, rinse the DNA-captured nanoparticle pellet by adding 100ul of freshly prepared 70% ethanol. Let stand for 30 seconds-1 minute.
    Note: Adjust the volume of ethanol as needed to sufficiently cover the DNA-captured nanoparticle pellet.
16. Remove and discard the ethanol.
17. Repeat steps 11-12, performing a total of two rinses.
18. Allow the sample to air dry at room temperature.
    Note: Time will vary depending on the reaction volume. Try not to allow pellet to over-dry and crack. This could affect the recovery.

DNA Elution

19. Elute the captured DNA from the nanoparticles by adding 20µl of the Elution Buffer.
    Note: The volume of the Elution Buffer can be adjusted as needed.
20. Gently pipette to mix well and incubate for 2 minutes at room temperature.
    Note: It is ideal not to introduce bubbles during the elution reaction.

Note: The pellet may not dissolve well due to protein precipitation. However, DNA extraction is not significantly affected.

21. Spin down a few seconds to collect the solution.
22. Place tube on magnetic rack for 1 minute to separate the nanoparticles from the eluted DNA.
23. Transfer the supernatant containing the DNA products to a clean tube. Make sure not to disturb the pellet. The purified DNA is now ready to use for subsequent evaluation.