# Protocol Dr Vida MagBeads

**Important: Do not freeze beads. Beads must be stored at 2-8°C and equilibrated to room temperature before use.**

## Protocol for PCR Reaction, Genomic DNA and Enzymatic Reaction Cleanup

Dr Vida MagBeads reagent offer a fast and convenient way to cleanup a PCR, Genomic DNA or enzymatic reaction. Typically, a 1:1.8x volumetric ratio of reaction-to-beads is used. Amplicons or DNA fragments >100bp are retained while smaller fragments, primers, linkers, enzymes and other buffer components are effectively removed. The following example demonstrates the procedure of cleaning up a 50 µL PCR reaction.

1. Equilibrate the Dr Vida MagBeads reagent at room temperature for at least 30 minutes. Vortex for 15 seconds to fully resuspend the beads.
2. Add 90 µL of Dr Vida MagBeads reagent to the 50 µL reaction in a 96-well PCR plate or tube and mix well by pipetting or vortexing. The reaction-to-beads ratio is 1:1.8.
3. Incubate at room temperature for 2-5 minutes.
4. Place the plate or tube on the magnetic stand at room temperature for 2-5 minutes or until the supernatant appears completely clear.
5. Remove and discard the clear supernatant taking care not to disturb the beads.
6. With plate or tube on the stand, add 200 µL of freshly prepared 80% ethanol to each magnetic bead pellet and incubate at room temperature for at least 30 seconds. Remove ethanol by pipette.
   **Important: 80% ethanol must be freshly made**.
7. Repeat step 6 for a total of 2 ethanol washes, ensuring all ethanol has been removed.
8. Remove the plate or tube from the magnetic stand and let dry at room temperature for 5 minutes or until dry.
   **Important: Do not over-dry the beads. Do not dry at high temperature or under vacuum**.
9. Resuspend dried beads with of 52 µL of Elution Buffer. Mix well by pipetting. Ensure beads are no longer attached to the side of the well.
10. Incubate resuspended beads at room temperature for 2-5 minutes.
11. Place the plate or tube on the magnetic stand for 2-5 minutes or until the sample appears clear.
12. Transfer 50 µL of clear sample to a new plate or tube.

## Protocol for NGS Library Size Selection

Dr Vida MagBeads reagent can be used for single-sided or double-sided size selection during NGS library preparation. By varying the beads ratio, DNA fragments of different sizes are bound to the beads.

Single-sided size selection follows essentially the same procedure as above (PCR Reaction and Enzymatic Reaction Cleanup), except that the beads ratio is adjusted to capture the different desired DNA length. A general guideline is provided as below but can be adjusted as necessary.

| Fragments to capture | Recommended ratio |
|---|---|
| ≥450 bp | 0.6x |
| ≥300 bp | 0.8x |
| ≥250 bp | 0.9x |
| ≥150 bp | 1.5x |
| ≥100 bp | 1.8x |

Double-sided selection removes both larger and smaller DNA fragments, making it ideal for preparing libraries optimized for the sequencing chemistry of choice. The following procedure is a 0.7x-0.9x selection, which generates 250-400bp fragments. Different ratios can be applied to further refine the selection range.

1. Equilibrate the Dr Vida MagBeads reagent at room temperature for at least 30 minutes. Vortex for 15 seconds to fully resuspend the beads.
   **Important: Beads must be warmed up to room temperature, otherwise, recovery rate will be lower**.
2. Add 35 µL of Dr Vida MagBeads reagent to 50 µL of sample in a PCR plate or tube. Mix thoroughly until homogeneous.
3. Incubate the sample at room temperature for 2-5 minutes.
4. Place the plate or tube on the magnetic stand at room temperature for 2-5 minutes.
5. Transfer 80 µL of the supernatant to a new well.
   **Important: Be careful not to transfer any beads with the supernatant**.
6. Add 10 µL of Dr Vida MagBeads reagent to the 80 µL supernatant. Mix thoroughly until homogeneous.
7. Place the plate or tube on the magnetic stand at room temperature for 2-5 minutes.
8. Remove and discard clear supernatant.
9. With plate or tube on the stand, add 200 µL of 80% ethanol to each magnetic bead pellet and incubate at room temperature for at least 30 seconds. Carefully remove ethanol by pipette.
   **Important: 80% ethanol must be freshly made**.
10. Repeat step 9 for a total of 2 ethanol washes. Ensure all ethanol has been removed.
11. Remove the plate from the magnetic stand and let dry at room temperature for 5 minutes or until bead pellet is visibly dry.
    **Important: Do not over-dry the beads. Do not dry at high temperature or under vacuum**.
12. Resuspend dried beads with 52 µL of Elution Buffer. Mix thoroughly until homogeneous.
13. Incubate resuspended beads at room temperature for 2-5 minutes.
14. Place the plate or tube on the magnetic stand at room temperature for 2-5 minutes.
15. Transfer 50 µL of clear sample to a new well.