



NZYSpeedy Miniprep

Catalogue number	Presentation
MB21001	50 columns
MB21002	4 x 50 columns
MB21004	2 x 50 columns
MB21005	10 x 50 columns

Description

NZYSpeedy Miniprep Kit is designed for the ultra-rapid, small-scale preparation of highly pure plasmid DNA from recombinant *Escherichia coli* strains. NZYtech's speedy miniprep procedure is based on the alkaline lysis of bacterial cells followed by adsorption of DNA onto a new specially treated silica membrane in the presence of high salt. The plasmid DNA is selectively adsorbed in the silica gel-based NZYtech plasmid spin column and other impurities such as proteins, salts, nucleotides and oligos (<40-mer) are washed away. The eluted DNA is suitable for applications like automated fluorescent sequencing, PCR and a wide range of other enzymatic manipulations. NZYSpeedy Miniprep Kit includes a newly developed washing buffer (Buffer AS) which ensures complete removal of contaminants in a rapid washing step.

Shipping & Storage Conditions

This product is shipped at room temperature. All kit components can be stored at room temperature (15-25 °C) and are stable till the expiry date if stored as specified.

Components

COMPONENT	MB21001 (50 COLUMNS)
Buffer A1	15 mL
Buffer A2	15 mL
Buffer A3	20 mL
Buffer AS (concentrate)	8 mL
Buffer AE (does not contain EDTA)	15 mL
RNase A	5 mg
NZYtech Spin Columns	50
Collection Tubes (2 mL)	50

Reagents, Materials and Equipment Required but Not Provided

- 96-100% ethanol
- 1,5 mL microcentrifuge tubes and disposable tips
- Centrifuge for 1,5 mL microcentrifuge tubes

Standard Protocol

Recommendations before starting

- Buffer A2 may form a precipitate upon storage. If necessary, dissolve the precipitate by warming the solution at 37 °C.
- Buffer A3 contains guanidine hydrochloride. Wear gloves and goggles when using this kit.

Procedures before starting

Reagents Preparation

- Buffer A1: add 1 mL of Buffer A1 to the RNase A vial and vortex. Transfer the resulting solution into the Buffer A1 bottle and mix thoroughly. Buffer A1 with RNase A should be stored at 4 °C for frequent use and at -20 °C for infrequent use.
- Buffer AS: add 32 mL of 96-100% ethanol to the bottle of Buffer AS.

Procedure

All centrifugations should be carried out at room temperature in a table-top microcentrifuge at $>12000 \times g$ (10000-15000 rpm depending on the rotor type).

1. Cultivate and harvest bacterial cells

Please see the Technical Notes section for recommendations on bacterial culture growth.

Pellet 1-5 mL of an *E. coli* LB culture for 30 s. Discard supernatant. Remove as much media as possible.

2. Cell Lysis

Re-suspend cell pellet in 250 μ L Buffer A1 by vigorous vortexing.

Add 250 μ L of Buffer A2 and mix gently by inverting the tube for 6-8 times. Incubate at room temperature for up to 2 min. Do not vortex.

Add 300 μ L Buffer A3. Mix gently by inverting the tube for 6-8 times. Do not vortex.

3. Lysate Clarification

Centrifuge for 5-10 min at room temperature, depending on initial culture volume.

4. DNA Binding

Place NZYtech spin column in a 2 mL collecting tube and load the supernatant from step 3 onto the column. Centrifuge for 1 min at $11,000 \times g$. Discard flow-through.

5. Wash Silica Membrane

Add 600 μ L of Buffer AS (make sure ethanol was previously added) onto the column. Centrifuge for 1 min. Discard flow-through.

6. Dry Silica Membrane

Re-insert the NZYtech spin column into the empty 2 mL collecting tube and centrifuge for 2 min.

7. Elute Highly Pure DNA

Place the dried NZYtech spin column into a clean 1.5 mL microcentrifuge tube and add 50 μ L of Buffer AE. Incubate 1 min at room temperature. Centrifuge for 1 min. By repeating this step the overall yield will increase by 15-20%. To obtain a highly concentrated miniprep (1.3 times higher) reduce the volume of elution buffer to 30 μ L. Store the purified DNA at -20 °C.

Note: It is extremely important to add the Elution Buffer into the centre part of the column. Incubating the column with the Elution Buffer at higher temperatures (37 to 50 °C) may slightly increase the yield especially of large ($>10,000$ bp) DNA Plasmids. Pre-warming the Elution Buffer at 55 to 80 °C may also slightly increase elution efficiency. If water is used for elution, make sure that its pH is between 7.0 and 8.5. Elution efficiency is dependent on pH and the maximum elution efficiency is achieved within this range. A pH <7.0 can decrease yield.

Technical Notes

Growing of bacterial cultures

LB medium is recommended for cultivation of bacterial cells. Alternatively, rich media like 2 $\times$ YT or TB may be used. Cells grow faster in these media and reach the stationary phase much earlier than in LB. This may lead to a higher percentage of dead or starving cells when starting the preparation, leading to partially degraded plasmid DNA that might be contaminated with chromosomal DNA. In addition, overgrown cultures may result in too much bacterial material affecting the efficacy of the lysis and precipitation steps. Pick a single colony from a freshly streaked selective plate and inoculate a culture of 1–5 mL LB medium containing the appropriate selective antibiotic. Incubate for 12–16 h at 37 °C with vigorous shaking.

Quality control assay

All components of NZYMiniprep Kit are tested following the isolation protocol described above. The purification system must isolate 15-35 μ g of pNZY28 plasmid DNA per column.

Troubleshooting

LOW OR NO DNA YIELD
• Incomplete lysis/viscous lysate
Make sure that the culture volumes were used according to the recommendations.
• Inadequate Buffers preparation
Check that Buffer AS concentrated was diluted with correct volume of ethanol.
CLOGGED COLUMNS
• Large amount of sample material
Check if the culture volume used is recommended. Do not use a large volume of sample. Increasing culture volumes not only obstruct the column but may also reduce plasmid DNA yields due to inadequate lysis.
LOW DNA QUALITY
• Presence of RNA
Make sure that RNase A was added to Buffer A1. See Reagents preparation described above.
• Degraded DNA/DNase contamination
Check your working area and pipettes for possible DNase contamination. Implement stringent cleanliness protocols.

By addressing these possible causes and implementing the suggested solutions, you can troubleshoot common issues encountered during the DNA isolation process and achieve better results with the NZYSpeedy Miniprep Kit.



For life science research only. Not for use in diagnostic procedures.