EMnetik SYSTEM

PCR CLEANUP AND PLASMID PREP – SIMPLIFIED

BECKMAN COULTER Life Sciences

Bring your PCR cleanup and plasmid prep into the 21st century.

Monotonous, time-consuming column cleanup has been around since 1991—so a change is long overdue. **And now it's here.**

When you replace your typical column cleanup steps with the benchtop EMnetik System, you'll spend half the time on PCR cleanup, which means you'll have more time for the *important* activities in your lab.

Benefits of the EMnetik System

- ~2x faster turnaround time compared to column PCR cleanups (16 min vs 30 min)
- >80% recovery (comparable to column PCR cleanup kits)
- Significantly fewer touchpoints
  - < 50 touchpoints compared to 300 for columns for PCR cleanup
  - No need to handle small columns or use a single-channel pipette
  - Move samples from a thermocycler or lysate to the EMnetik 24 microparticle processor, and don't move them again until final elution
- Plasmid recovery of 4-7 µg shown for a high copy plasmid
- Intuitive user interface removes guesswork by providing clear, step-by-step instructions
- Column-based cleanups are officially history.

The EMnetik System Is the Future of Simplified PCR Cleanup

Comparison of an EMnetik System workflow with a column workflow.

You can see how the system alleviates common column pain points.

1 & 2 No more worries about smeared sample numbers or confusing 6s and 9s. Your samples can stay in a 24-well format post lysis—or the format used for your PCR or enzymatic reaction. You can save sample names, however, in a way that's best for you, not written in ink on a column that can easily smudge.

3 Move samples directly from a thermocycler or lysate to the EMnetik system, reducing the potential for dropping them, and you won't have to move them again.

4 Instead of using a single-channel pipette, you can use a multi-channel pipette to quickly process 24 samples.

5 Complete the bind, wash and elute steps in one place with the user-friendly EMnetik 24 microparticle processor interface.

> "The EMnetik device is nice because the protocol is right there in front of the user on the screen that has step-by-step instructions and videos for extra explanations."
>
> – User 1 from MRI Global

EMnetik 24 Microparticle Processor

C57784

The EMnetik 24 microparticle processor is designed to work with the EMnetik PCR Cleanup Kit and EMnetik Plasmid Purification Kit in genetic engineering workflows.

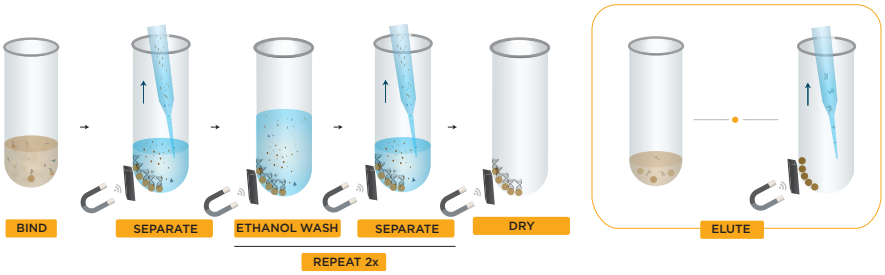
EMnetik PCR Cleanup Kit

C68442

DNA cleanup from enzymatic reactions

The EMnetik PCR Cleanup Kit is a revolutionary bead-based DNA cleanup kit. Using new SuperSPRI technology combined with the EMnetik 24 microparticle processor, users can complete PCR cleanups in 16 minutes.

EMnetik PCR Cleanup Workflow



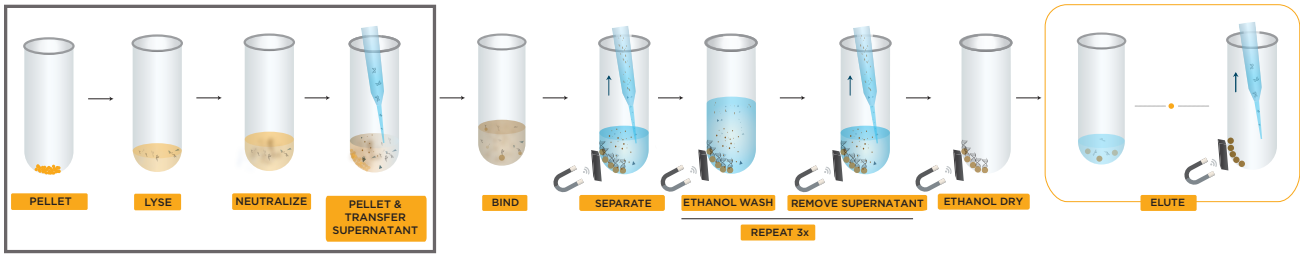
1. Add your sample to the instrument
2. Add EMnetik PCR Cleanup Kit to sample (1.8x ratio)
3. Start *Bind Mix and Separate*
4. Remove supernatant
5. Add Ethanol to wash
6. Remove supernatant
7. Repeat Steps 5 & 6
8. Start Ethanol Dry
9. Add eluant
10. Start *Elution Mix and Separate*
11. Move final elution to preferred labware

EMnetik Plasmid Purification Kit

C68445

The EMnetik Plasmid Purification Kit is a new bead-based DNA cleanup kit. Using new SuperSPRI technology combined with the EMnetik 24 microparticle processor, users can complete a plasmid prep without having to handle columns.

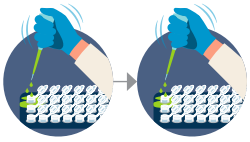
EMnetik Plasmid Purification Workflow



1. Pellet your sample
2. Add L1 to lyse your sample
3. Add N3 to neutralize your sample
4. Pellet the flocculant and remove the supernatant to a new tube
5. Add your sample to the instrument
6. Add your EMnetik Plasmid Purification Bind to your sample
7. Start *Bind Mix and Separate*
8. Remove supernatant
9. Add Ethanol to wash
10. Remove supernatant
11. Repeat steps 5 and 6
12. Start your Ethanol Dry
13. Add your eluant
14. Start *Elution Mix and Separate*
15. Move your final elution to your preferred labware

EMnetik PCR Cleanup Workflow: ~2x Faster Compared to Column Cleanups

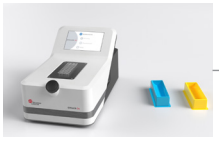
SAMPLE SETUP



Add Buffer to Samples → Add Samples to Columns

6:42 | 96

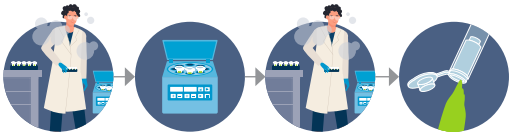
1:59 | 13



Add Samples in PCR Tubes to EMnetik 24 Tube Holder

Add EMnetik PCR Cleanup Reagent

BIND AND MIX



Move Samples to Centrifuge → Centrifuge Samples → Remove Samples from Centrifuge and Back to Workstation → Discard Flow-through

4:05 | 72

3:15 | 4

Start the "Bind Mix and Separate" Step

Remove Supernatant

WASH SAMPLES

Add Wash Buffer to Samples → Move Samples to Centrifuge → Centrifuge Samples → Remove Samples from Centrifuge and Back to Workstation → Discard Flow-through

Move Samples to Centrifuge → Centrifuge Samples → Remove Samples from Centrifuge and Back to Workstation → Discard Flow-through

10:25 | 168

4:50 | 12

Add Ethanol to Wash Samples

Remove Supernatant

Repeat Ethanol Wash

ELUTION

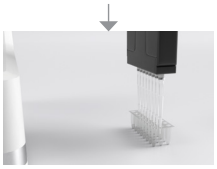
Add Eluant to Samples → Move Samples to Centrifuge → Centrifuge Samples → Remove Samples from Centrifuge and Back to Workstation → Discard Columns

7:10 | 120

3:55 | 8

Add Eluant

Start the "Elution Mix and Separate" Step



Move the Elution to Preferred Labware

TOTAL

456 | 28:22

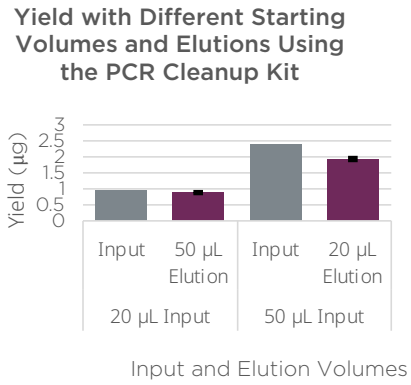
13:59 | 37

The workflow on the left illustrates a common column-based cleanup. The workflow on the right shows the fast, simple and easy-to-follow workflow using the EMnetik 24 microparticle processor. The left workflow is about 30 minutes while the right workflow takes half the time. The left one has over 400 touchpoints while the right workflow has fewer than 50.

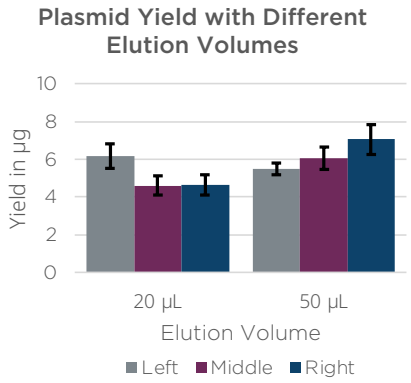
With the EMnetik System You Have Flexible Options

By using the EMnetik system you can choose your starting volume, your elution volume and your labware. Shown in the next few graphs are the results after using the different options. You can be confident that you can get clean DNA after using the EMnetik system.

With the EMnetik PCR cleanup kit and the EMnetik plasmid purification kit you can choose your elution volume.



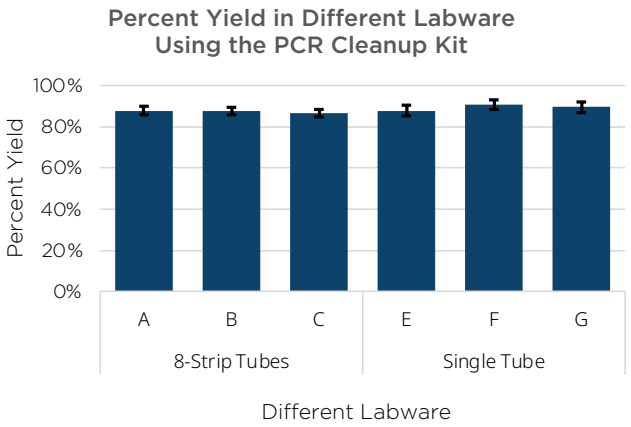
Yield of elutions from 2 different starting inputs and 2 different elution volume options (50 µL and 20 µL). Bars indicate the average of 9 replicates on the device; error bars indicate the standard deviation of the replicates.

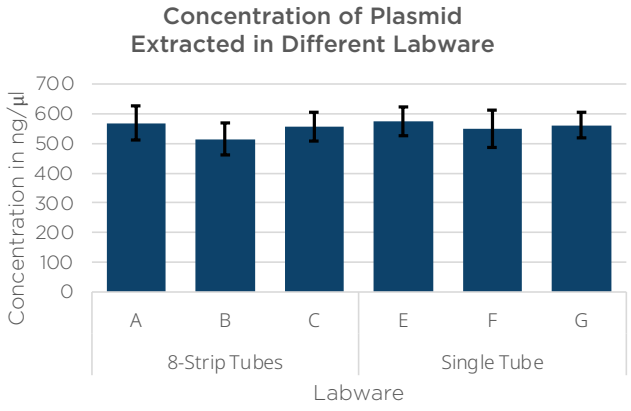


Yield of elutions from 2 different elution volume options (50 µL and 20 µL). The bars are the average of 8 replicates on the device, and the error bars are the standard deviation of the replicates. The left middle and right refer to the placement in the EMnetik system; for example, the left most column of samples are averaged in the left grey bars.

Both reagent kits allow you to choose the labware.

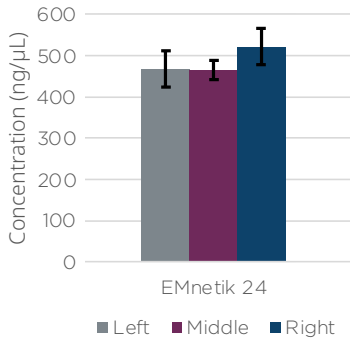
Yield does not vary widely when using different labware. In the graph on the left the first three bars show the yield after PCR cleanup using PCR 8-strip tubes, and the second three bars show the yield using single PCR tubes. The bars represent the average of 8 samples; error bars indicate the standard deviation of the 8 samples. The right graph shows the concentration of plasmid extracted using the EMnetik plasmid purification kit. The first three bars show the yield using PCR 8-strip tubes, and the second three bars show the yield using single PCR tubes. The bars represent the average of 8 samples; error bars indicate the standard deviation of the 8 samples. For both graphs the tubes are as follows: A: Thermo Scientific AB-2005, B:VWR 93001-118, C: VWR 20170-002, D: Thermo Scientific AB-0337, E: VWR 20170-010, and F: VWR 20170-012.





Plasmid Extraction Shows Little Variability Across Device

Plasmid Concentration



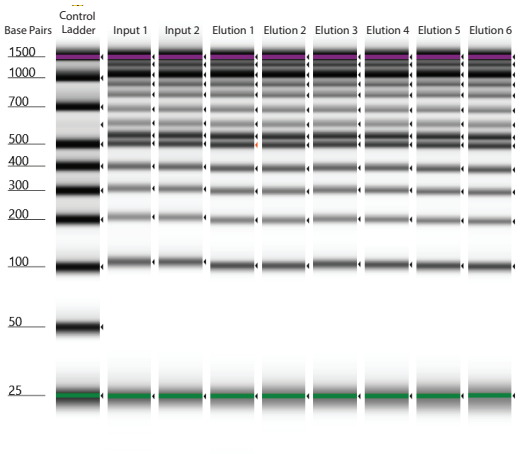
The concentration of pUC19 plasmid a high copy number plasmid extracted from *E. coli* was extracted using the EMnetik Plasmid Purification Kit on the EMnetik 24 microparticle processor. The bars are an average of 8 replicates. The error bars are the standard deviation. While the EMnetik 24 microparticle processor can only hold 100 µL of lysis, which is one-third of a typical column plasmid purification, the EMnetik plasmid purification kit extracted over 400 ng/µL of plasmid.

> "We were most surprised with EMnetik's System's robustness. The device moved the beads to the side making it so easy to aspirate."
>
> – Joshua James, Ph.D. Student

DNA Is Stable Using the EMnetik PCR Cleanup Kit

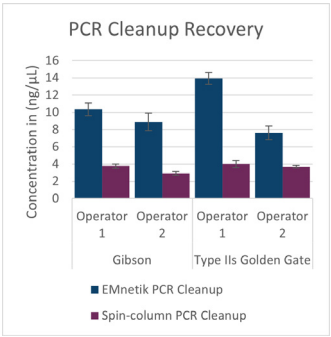
To test that DNA was not degraded during the automatic bead mixing or separation, NEB 100bp DNA ladder (PN: N3231L) was used as input. The lanes with input 1 and 2 show the input ladder and the lanes with elution 1 – 6 show the ladder after cleanup. All bands can be seen in all lanes, indicating that DNA is not degraded during the cleanup process.

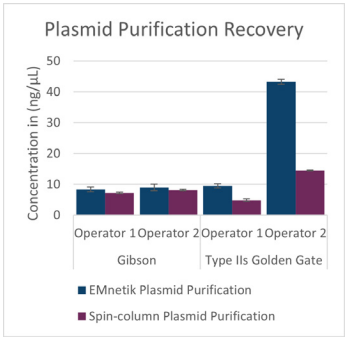
> "I did prefer the EMnetik System because of its simplicity and efficiency, despite being more familiar with column based protocols."
>
> – User 2 at MRI Global



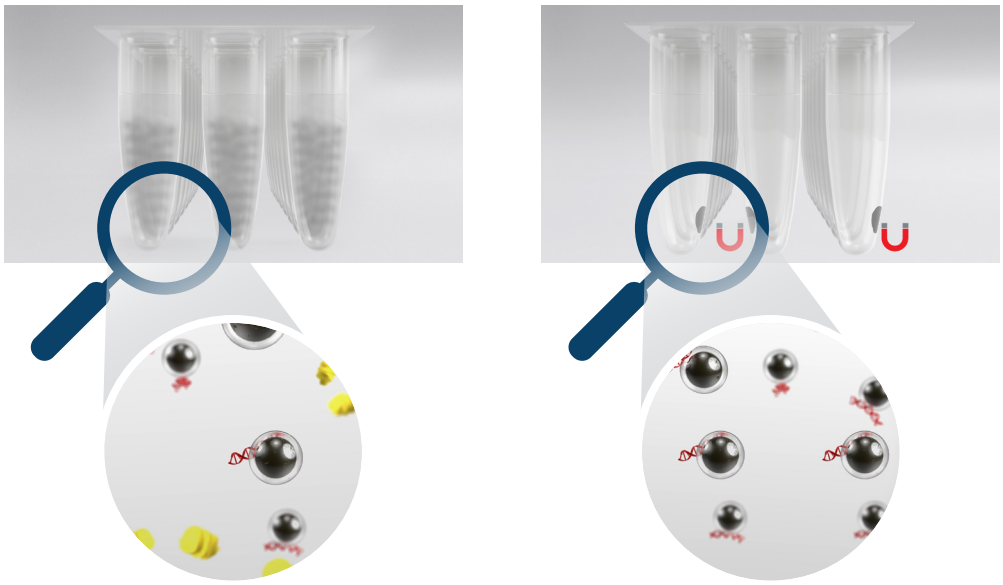
Similar Performance Compared to Spin-Column Kits

On the right the concentration of DNA recovered using either a EMnetik PCR cleanup kit or a spin-column cleanup kit. The DNA recovered were from either a Gibson assembly or a Type IIs Golden Gate assembly. The EMnetik PCR cleanup kit on average did better than the spin-column cleanup kit for these two users. Plasmids were also isolated using either the EMnetik Plasmid Purification kit or a spin-column plasmid purification kit as seen in the graph on the right. The bars are an average of three cleanups and the error bars are the standard deviation of those cleanups.





Automatic Magnetic Bead Mixing and Separating



A look inside the EMnetik 24 microparticle processor and the EMnetik PCR Cleanup kit.

Left: a photo illustrating the automatic mixing of reagent containing SuperSPRI beads and sample. The system uses electromagnets to mix samples—no pipetting required. **Right:** an illustration of highly responsive magnetic SuperSPRI beads binding only to the DNA in your sample. Once SuperSPRI beads are mixed with your sample, the EMnetik 24 microparticle processor uses a magnet to pull samples to the side of the tubes so you can remove contaminants in the supernatant, leaving only your sample bound to the beads. The DNA can be eluted off in water.

PART NO	PRODUCT NAME	NUMBER OF PREPS
C57784	EMnetik 24 Microparticle Processor	—
C68442	EMnetik PCR Cleanup Kit	500 (50 µL preps)
C68445	EMnetik Plasmid Purification Kit	96
C81106	EMnetik 24 + EU Power Cord	—
C79155	One Year Extended Warranty	—

For more information, please contact:

Name

Email

Phone

Not intended or validated for use in the diagnosis of disease or other conditions.

For Beckman Coulter's worldwide office locations and phone numbers, please visit Contact Us at beckman.com

22.02.4032.GEN