

## magnetiQ<sup>®</sup> Plasmid Miniprep Kit

The Galenvs magnetiQ Plasmid Miniprep Kit enables a rapid and efficient method of plasmid extraction and purification. The plasmid isolation kit provides extraction of plasmid DNA through magnetic bead-based lysis and capture of plasmids from transformed bacteria.

Achieve highly efficient capture of molecular biology and transfection grade plasmids yielding purified solutions with negligible gDNA, RNA, protein, chemical compounds and endotoxin carryover, with reduced handling time for the user, for various downstream applications such as transfection, PCR, and sequencing. The magnetiQ Plasmid Miniprep Kit enables simple and rapid plasmid extraction from cultured bacteria in 15–20 minutes using magnetic nanoparticles. The kit is also compatible with automated platforms in the form of pre-filled plates, for high throughput multiple sample processing. No need for spin columns and multiple centrifugation steps, no more problems related to columns clogging.

### Applications

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- Molecular biology
- In Vitro transfection
- PCR amplification, DNA sequencing, molecular cloning

### Features

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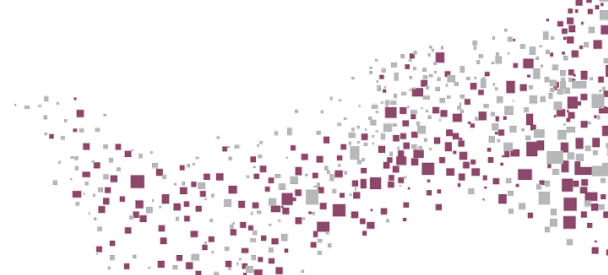
- Amenable to high-throughput methods, including automation
- Faster and simpler magnetic collection and resuspension steps
- Reduces concern for clogging
- Eliminates centrifugation steps with bacterial lysis and removal of cell debris, proteins, and denatured gDNA

### Performance

The Galenvs kit's performance was evaluated through yield and quality assessment of plasmid preparations – from transformed DH5a competent E. Coli cells – compared to three widely used, industry leading kits:

- QIAprep Spin Miniprep Kit from QIAGEN (Qiagen)





- Invitrogen PureLink Quick Plasmid Miniprep Kit from ThermoFisher (Thermo)
- Omega BIO-TEK Mag-Bind Ultra-Pure Plasmid DNA (Omega)

## Yield

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To evaluate yield of plasmid extraction, a 9.3 Kbps plasmid vector (pcDNA3.1-SARS2-Spike, Addgene ID. 145032) was inoculated in Miller Luria-Bertani (LB) Broth and used as a sample input. 2 mL of bacteria was pelleted and resuspended in appropriate resuspension buffers were used in Qiagen, Thermo and Omega as per manufacturer protocols.

Yield and quality were evaluated using spectrophotometric measurements for quantification at A260, as well as salt and organic contamination using A260/A280 and A260/A230 ratios. Gel electrophoresis was also performed to evaluate plasmid quality, in addition to evaluating the RNA and genomic DNA (gDNA) contamination. All samples were run in triplicates for standard deviation analysis.

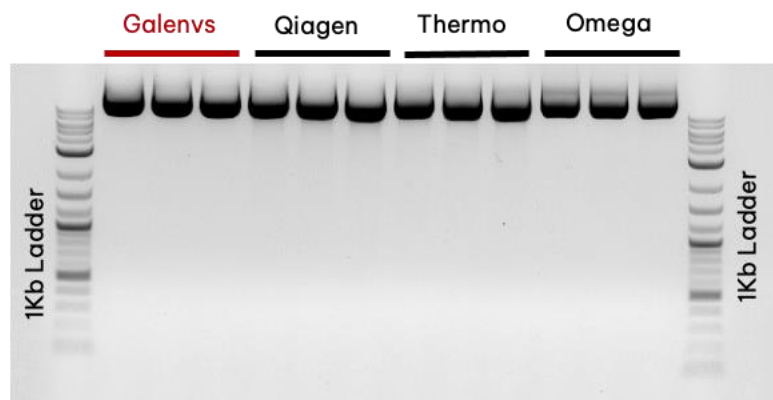


Figure 1: Gel Electrophoresis of purified plasmid preparation of pc-SARS2-spike vector

A comparison of the plasmid DNA yield from *E. coli* host strain DH5a harboring pc-SARS2-spike plasmid (9300 bp) showed that Galenvs Miniprep Kit consistently produce higher yields of plasmid DNA compared to those of other suppliers including Qiagen, Thermo, Omega. All plasmid preps were performed according to recommended protocols using 2 ml of the same overnight culture of *E. coli* strain DH5a cultured in LB medium. The ladder is Quick-Load Purple 1 kb Plus DNA Ladder (NEB N0550).



Table 1 Spectrophotometry analysis of purified plasmid preparation

	Quantity (ng/ $\mu$ L)	A260/A280	A260/A230
<b>Galenvs</b>	242.65 $\pm$ 10.53	1.88 $\pm$ 0.02	2.18 $\pm$ 0.03
Qiagen	220.12 $\pm$ 14.65	1.88 $\pm$ 0.01	2.23 $\pm$ 0.01
Thermo	171.51 $\pm$ 2.34	1.91 $\pm$ 0.02	2.20 $\pm$ 0.08
Omega	114.51 $\pm$ 1.26	1.89 $\pm$ 0.02	1.26 $\pm$ 0.35

Table 1 shows the spectrophotometry analysis of purified plasmid preparations from the 1 mL of bacterial culture. Compared to the competitors, the Galenvs kit produces the highest plasmid yield with high purity.

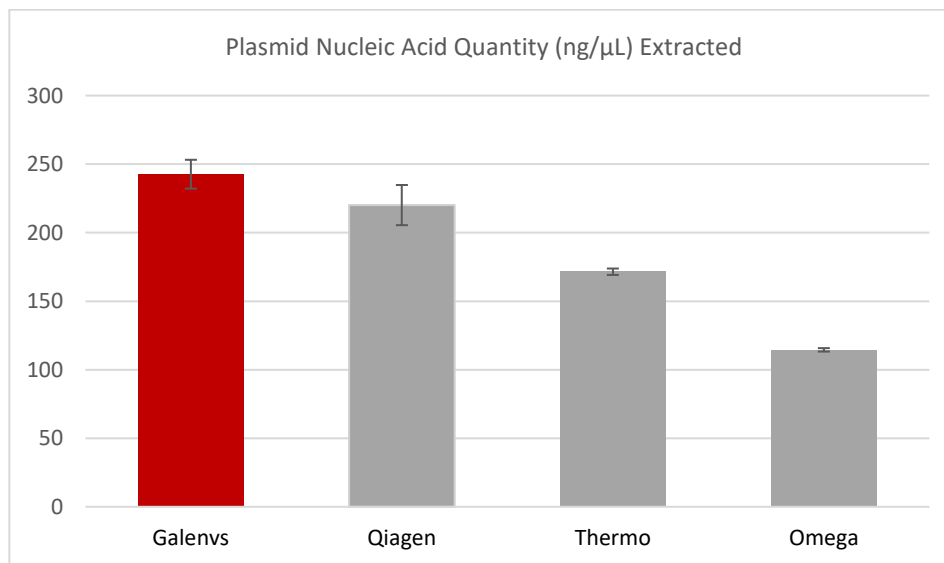


Figure 2: Plasmid nucleic acid quantity measurements of purified plasmid preparations

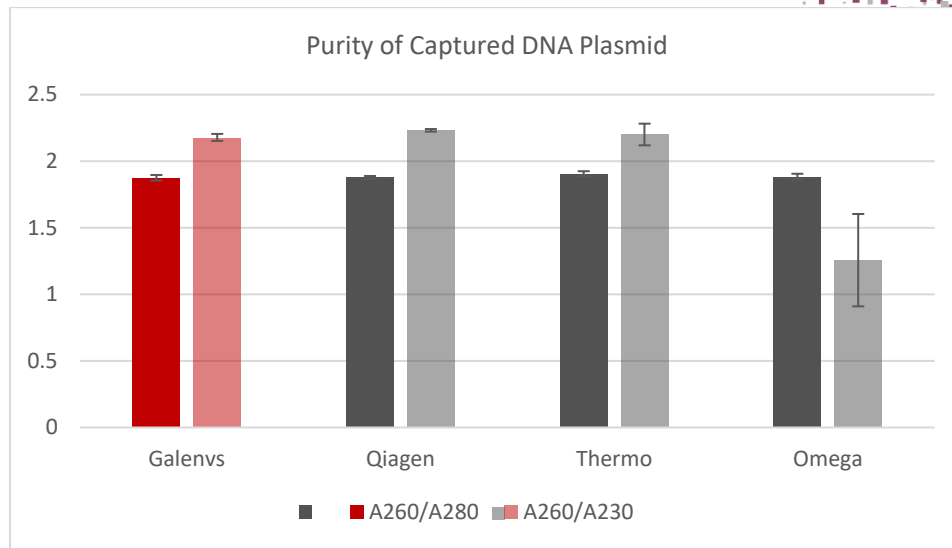


Figure 3: Plasmid nucleic acid purity measurements of purified plasmid preparations

Figures 2 and 3 are graphical representations of plasmid quantity and purity obtained using the Galenvs kit compared to Qiagen, Thermo and Omega. While Galenvs does not rely on centrifugation methods, it yielded the highest quantity of extracted plasmid.

## Transfection

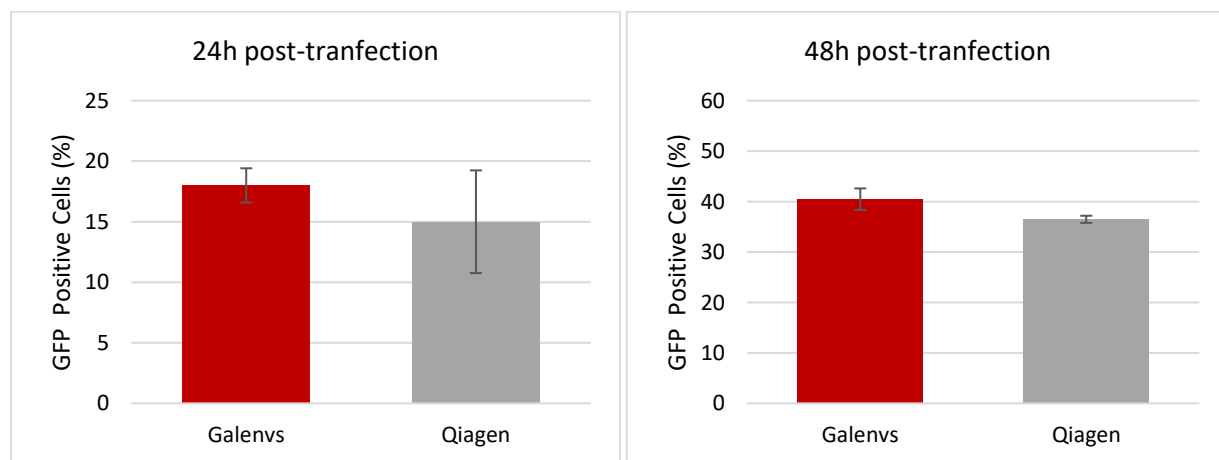


Figure 4: Transfection efficiencies of plasmid DNA generated using Galenvs Kit, and Qiagen Kit.

Transfections were performed on 293T cells with 1  $\mu\text{g}$  of plasmid DNA (H2B-GFP plasmid, 5107 bp, Addgene #11680), using Lipofectamine 3000 (Invitrogen). Cells were plated on 35 mm plates 24 h before transfection. Higher transfection efficiency was



observed from plasmid DNA samples purified with the Galenvs kit compared with the Qiagen kit.

## Endotoxin Levels

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Table 1 Plasmid DNA was isolated from 2 mL LB cultures following each manufacturer's recommended protocols. Endotoxin levels were determined with Thermo Scientific's Pierce LAL Chromogenic Endotoxin Quantitation Kit.

	Endotoxin Level (E.U./ $\mu$ g of pDNA)
pSARS2 spike Qiagen	0.044
pSARS2 spike Galenvs C	0.061

## Results

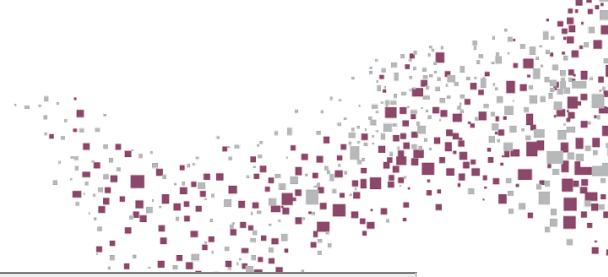
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The Galenvs magnetiQ Plasmid Miniprep Kit alleviates the need for centrifugation steps and separate collection tubes – in contrast to standard column-based kits. In addition, the Galenvs Plasmid Miniprep Kit allows for facile bacterial lysis, plasmid binding, and endotoxin removal only using a standard magnetic rack. The Galenvs magnetiQ Plasmid Miniprep Kit performance demonstrates high yield and pure plasmid extraction for both low and high-copy vectors. Sample processing is completed in less than 20 minutes, yielding high purity and efficient recovery of molecular biology and transfection grade plasmids.

## Specifications

The Galenvs magnetiQ Plasmid Miniprep Kit contains optimized buffers for molecular biology applications developed with Galenvs' functionalized magnetic beads and optimized with machine-learning approaches for protocol development and reagent formulation.

Sample Type	Bacteria Culture
Quantity	100 or 250 assays / Ready-to-use Prefilled plates (16 preps)
Elution Volume	50 $\mu$ l
Processing mode	Automated / Manual
Throughput	100–250 samples per run



Binding Technology	Magnetic beads
Binding Capacity	Scalable
Components	<ul style="list-style-type: none"> <li>(i) Resuspension Buffer</li> <li>(ii) Lysis Buffer</li> <li>(iii) Neutralization Buffer</li> <li>(iv) Binding Buffer</li> <li>(v) Wash 1 Buffer</li> <li>(vi) Wash 2 Buffer</li> <li>(vii) Elution Buffer</li> </ul>
Storage	Room Temperature

### Product Codes

100 preps	PM0100
250 Preps	PM0250
Prefilled plates 16 -well	PM0016