Automated Plasmid Purification Solution from up to 50 mL Culture Input

A Pre-scripted Application Developed by Omega Bio-tek for the Dynamic Devices Lynx

Automated Plasmid Extraction

24 x 50 mL samples
~80 minutes

Up to 50 mL Culture

Up to 50 mL input culture
No manual centrifugation
Yields up to 200 µg

Plasmid DNA preparation is a fundamental technique in molecular biology, commonly used in applications ranging from cloning and genetic modification to therapeutic research and biopharmaceutical development. Traditional manual plasmid purification methods are often labor-intensive, time-consuming, and prone to variability. Moreover, endotoxin contamination poses significant challenges for downstream applications, particularly those involving sensitive eukaryotic cell cultures or clinical-grade products.

Omega Bio-tek and Dynamic Devices offer a novel automated plasmid purification solution capable of processing culture input samples up to 50 mL without manual centrifugation. The workflow uses Dynamic Devices' Lynx LM1200 platform with the 24ST Pipetting Tool and 24XL MagRod head in conjunction with Omega Bio-tek's Mag-Bind® Endo-free Plasmid Midi Kit and E-Z Select® 24-Well Plates. This workflow integrates multiple steps, such as alkaline lysis, binding, washing, and elution, into an automated process that minimizes hands-on time while ensuring consistent results. The automated workflow is capable of processing 24 x 50 mL bacterial cultures in ~80 minutes.

omega BIO-TEK
innovations in nucleic acid isolation

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Comparable Plasmid Yields Regardless of Extraction Method

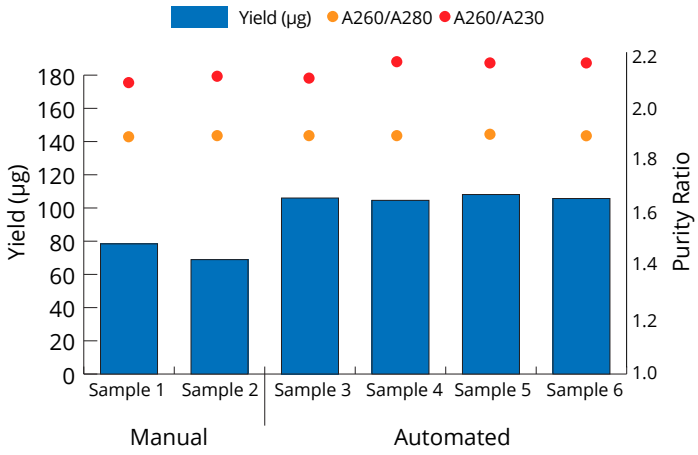

Figure 1. Average plasmid DNA yield values from 50 mL culture volume.

Results

Plasmid DNA was purified from 50 mL culture input volume both manually, following Omega Bio-tek's Mag-Bind® Endo-free Plasmid Midi Kit protocol, and automated using the same chemistry on Dynamic Devices' Lynx system. Plasmid DNA yield and quality were quantified using the NanoDrop 2000c system. Average yield and purity values are shown in Figure 1. Yields were ~1.4X higher for extractions run using the Mag-Bind® Endo-free Plasmid Midi Kit automated on the Dynamic Devices Lynx with manual extractions averaging 73.6 µg and automated extractions averaging 106.1 µg. Average purity values were comparable between the two extraction methods, A260/A280 ~1.8 and A260/A230 ~2.2, indicating purification of high-quality plasmids using this workflow.

Conclusions

Omega Bio-tek and Dynamic Devices have collaborated to devise a robust and straightforward method for automating plasmid purification from high-volume culture inputs (up to 50 mL). This workflow eliminates manual centrifugation providing a true walk-away solution. Plasmids purified using this automated workflow are shown to be equivalent or better in terms of yield and purity compared to plasmids purified from manual techniques.

E-Z Select® 24-Well Plate

Product Information

Description	Product No.	Size
Mag-Bind® Endo-free Plasmid Midi Kit	M1272-00	1 x 24 Preps
	M1272-01	4 x 24 Preps
E-Z Select® 24-Well Plate	PS24N-25SWV-16	16 Plates

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