Application Note

INTEGRA

Increase speed and efficiency of loading agarose gels using the VOYAGER pipette

Introduction

Gel electrophoresis is a standard laboratory procedure that is indispensable for nucleic acid visualization and purification. Samples are loaded onto a rigid polysaccharide gel, then subjected to an electric field. This induces migration towards the anode due to the negative charge of the nucleic acids, separating the individual components by size and/or conformation. Typically, samples from 96 well plates or PCR strips are loaded onto agarose gels using a single channel pipette. Multichannel pipettes with fixed tip spacing cannot be used, because the spacing of the gel wells is usually different to the 9 mm spacing of well plates and PCR strips. The VOYAGER electronic adjustable tip spacing pipette is the ideal solution. It offers one-handed operation and automatic adjustment of tip spacing to enable straightforward aspiration and dispensing of samples from well plates or PCR strips into the pockets of an agarose gel. Gel loading is much faster than with a traditional single channel pipette, because multiple samples can be transferred simultaneously.

Key benefits:

- The VOYAGER enables the simultaneous transfer of multiple samples in various labware formats, increasing speed, efficiency and throughput.
- VOYAGER pipettes feature a unique motorized tip spacing function, enabling one-handed adjustment of the spacing with a simple push of a button. It offers advantages over manual tip spacing adjustments, for example, leaving the other hand free to handle labware.
- The increased throughput of a multichannel pipette results in much faster work and fewer transcription errors, because the user does not need to go back and forth from the sample source to the gel very often.
- The VOYAGER enables much more precise and reproducible pipetting into the gel, as 8 or 12 channels can be pipetted simultaneously, at the same speed and height.
- The VOYAGER helps prevent repetitive strain injuries (RSIs) and pipetting errors by reducing transfer steps.
- The VOYAGER forms a perfect system in combination with GripTips, which never leak or fall off.

Overview: How to accelerate gel loading with the VOYAGER

In this protocol, a VOYAGER 8 channel 12.5 µl adjustable tip spacing pipette with Low Retention, Sterile, Filter GripTips is used to load eight DNA samples from a 96 well plate into an agarose gel in one go. Tip spacing adjustment is needed prior to loading the samples onto the gel.

VOYAGER electronic pipette

Step-by-step procedure:

Experimental set-up

Overview of the steps:
1. Tip spacing adjustment
2. Gel loading

1. Tip spacing adjustment	**STEP:** Different tip spacing set-ups for the 96 well plate and the gel	**HOW TO:** Before starting, the user needs to adjust the tip spacing in the Main Menu under Tip Spacing. The tip spacing of the 96 well plate and the PCR strips is 9 mm, and the gel comb of the 16 well gel is 4.5 mm. Choose 'Position 1' and set the tip spacing to 9 mm according to the 96 well plate, then choose 'Position 2' and set the tip spacing to 4.5 mm according to the agarose gel wells. After saving, select 'Pipet' mode in the Main Menu. **Tip:** • If required, it is easy to set up a different tip spacing. VOYAGER pipettes allow tip spacing from 4.5 to 33 mm.
2. Gel loading	**STEP:** Sample transfer from sample plate to the agarose gel	**HOW TO:** Set the required volume and transfer the first eight DNA samples from the 96 well plate into the agarose gel. Pressing the left or right arrow on the Touch Wheel will automatically adjust the tip spacing (**Figure 1**). **Tips:** • For better results, pipette the samples into the agarose gel slowly to allow them to run down to the bottom of the pockets and avoid introducing air bubbles. Setting the dispensing speed at 4 or lower gives optimal results. • Low Retention GripTips demonstrate excellent results when pipetting the viscous sample-DNA dye mixture.

A) **B)**

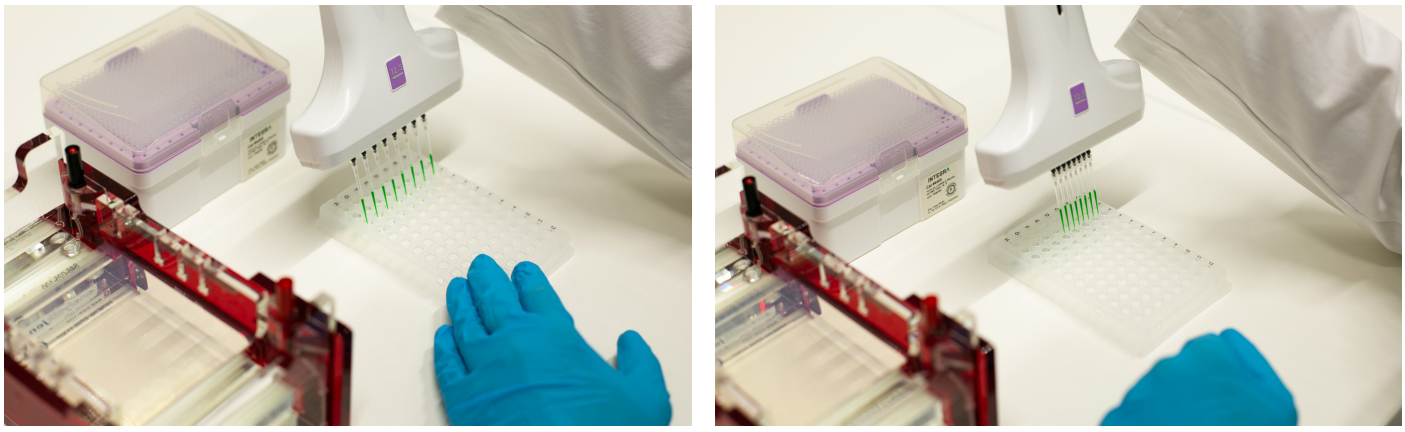

Figure 1: Sample transfer from a 96 well plate to an agarose gel. A) Sample aspiration from a 96 well plate using the VOYAGER 8 channel 12.5 µl electronic pipette with 9 mm tip spacing. B) Tip spacing is changed to 4.5 mm with the push of one button.

Repeat the transfer step and load the second set of samples into the empty wells of the agarose gel (**Figure 2**).
The gel is now ready for electrophoresis.

A) **B)**

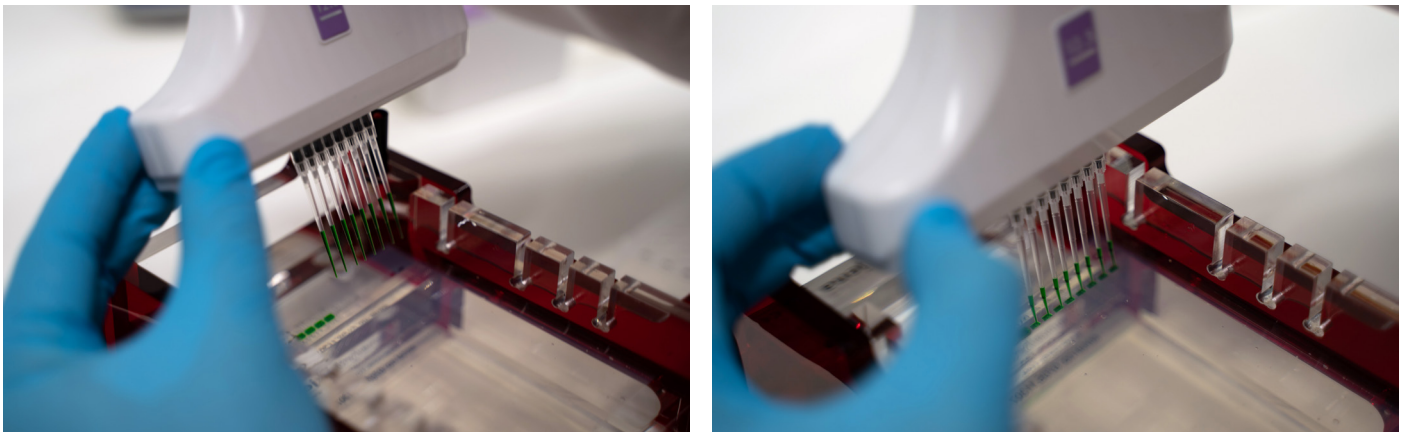

Figure 2: Gel loading. A) 4.5 mm tip spacing fits perfectly with the distance of the wells in the agarose gel. B) Easy, simultaneous loading of eight samples.

Conclusion

- Gel loading with the VOYAGER multichannel electronic pipette is precise, reproducible and eight times faster compared to single channel pipettes, saving time for other experiments and eliminating transcription errors.
- Tip spacing can be changed to fit 96 well plate and the gel pockets with just the push of a button.
- The best pipetting results are achieved when using Low Retention GripTips for viscous liquids.

Materials

Manufacturer	Part Number	Description	Link
INTEGRA Biosciences	4721	VOYAGER 8 channel 12.5 µl pipette	https://www.integra-biosciences.com/global/en/electronic-pipettes/voyager
INTEGRA Biosciences	3515, 3518	12.5 µl Low Retention, Sterile, Filter GripTips	https://www.integra-biosciences.com/global/en/pipette-tips/griptip-selector-guide

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