

## DNA Fragments Separation via Vertical Gel Electrophoresis System

### INTRODUCTION

DNA electrophoresis is a widely used separation technique for molecular biology research. Using a vertical system with polyacrylamide gel for DNA electrophoresis has several advantages over horizontal system: First, a vertical system provides higher resolving power for small DNA fragments separation, thus it can be applied to distinguish the small length differences. Second, it can accommodate larger amount of DNA samples without significant loss of resolution. Third, the recovered DNA from acrylamide gel is purer than from agarose gel thus it does not affect the subsequent experiments. The small fragment of DNA marker was used in Wealtec's vertical gel electrophoresis system (V-GES) which would illustrate the performance of DNA electrophoresis in a vertical system.

### MATERIALS

- V-GES with ELITE 300 Plus power supply (Wealtec)
- KETA GL imaging system (Wealtec)
- 100 bp DNA marker (Fermentas)
- 1x TBE buffer
- 0.5 µg/ml EtBr (in 1x TBE buffer)

### PROCEDURES

- Referred to the V-GES instruction manual to prepare acrylamide gel. The ingredients for two mini-gel with 0.75 mm spacer was as following:

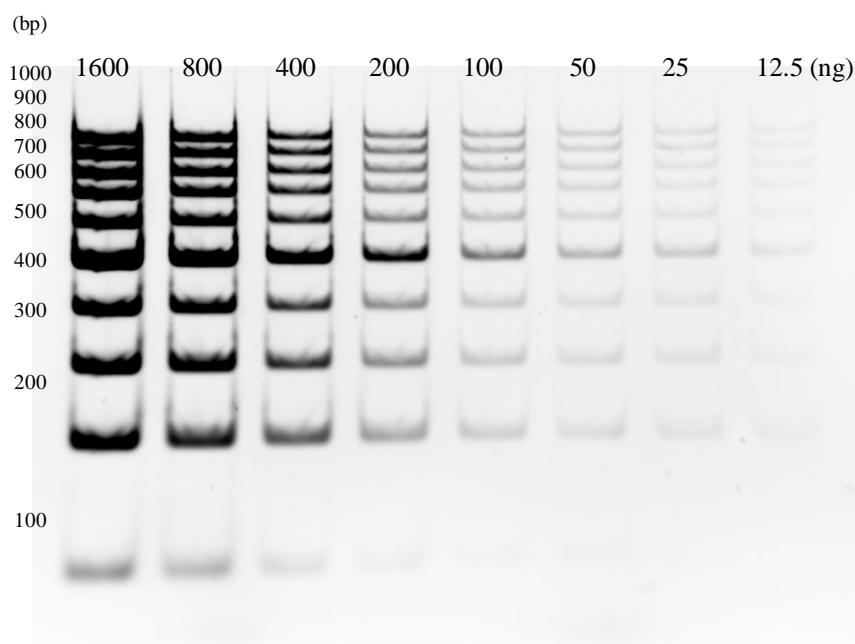
Resolving Gel Percentage	H <sub>2</sub> O (ml)	Acrylamide/Bis 30% 29:1(ml)	5x TBE (ml)	10% APS (µl)	TEMED (µl)
5.0%	10.03	2.66	3.2	160	8

- DNA samples were separated by 5% acrylamide gel in 1x TBE buffer at 100 V for an hour by V-GES and ELITE 300 Plus.
- After electrophoresis, gels were stained with 0.5 µg/ml EtBr(in 1x TBE buffer) for

another hour, and then detained with distilled water for 30 min.

- Gels were excited by 312 nm UV light source, and image was taken by KETA GL imaging system and with WK101 filter.

## RESULT



**Figure 1.** DNA electrophoresis by V-GES. EtBr signals were excited by 312 nm UV transilluminator and captured by KETA GL imaging system through WK101 filter with 0.6 seconds exposure time.

## DISCUSSION

According to previous numbers of reports, it has no doubt that V-GES providing a premium quality for protein separation. In this article, V-GES also has been proven that having high resolving power for separation of small DNA fragments (*fig. 1*). It can separate DNA marker clearly from 100 to 1000 base pairs in 5% acrylamide gel. Furthermore, V-GES system can accommodates larger amount of DNA samples than horizontal system within the separation process in acrylamide gel. As in *fig. 1*, the loading amount can get over than 1.6  $\mu$ g without any significant loss of resolution.

Wealtec's V-GES makes a revolution for vertical gel electrophoresis system. It possesses several patented designs to provide users an easy operation system, such as clasp-release design which allows easy assembling and disassembling. In addition, V-GES

provides a high-capacity tank to cool down system without extra cooling apparatus thus promises users the gel with the best resolution. Besides, V-GES has also been proved to have good performance on separating DNA through acrylamide gel. Remarkably, vertical gel electrophoresis system that supplied by Wealtec provided as the most useful and trustable equipment for daily experiments.