Applied Biosystems

BigDye® Terminator v3.1 and v1.1 Cycle Sequencing Kits

- **Enhanced robustness improves success rates, particularly with challenging templates**
- **Comprehensive chemistry solution for today's wide range of sequencing applications**
- **Improved peak-height uniformity and optimized signal balance for longer, higher quality reads**
- **Enable completion of sequencing projects more quickly and economically**

Improved Performance

BigDye® Terminator v3.1 and v1.1 chemistries provide a variety of benefits over earlier versions of BigDye chemistry. The new kits offer improved performance in sequencing difficult templates, successfully reading through dinucleotide repeats and other challenging sequence motifs. Both formulations are also designed to offer improved robustness with a wide range of template types and qualities. In addition, v3.1 and v1.1 kits generate data that has greater peak-height uniformity, which enhances basecalling accuracy and mixed-base detection. Overall, v3.1 and v1.1 kits enable longer sequencing reads and higher success rates, which lead to reduced project costs.

New Chemistries to Address Your Sequencing Needs

Like its predecessor (ABI PRISM® BigDye Terminator v3.0 Cycle Sequencing Kit), the new BigDye® Terminator v3.1 Cycle Sequencing Kit is optimized for the majority of DNA sequencing applications. The BigDye® Terminator v1.1 Cycle Sequencing Kit, which is based on the original ABI PRISM® BigDye Terminator chemistry (v1.0), is formulated for specialty applications. Together, these two new powerful and versatile chemistries meet the demands of the wide range of sequencing applications performed today.

Chemistry Options

Applications	BigDye® Terminator v3.1 Kit	BigDye® Terminator v1.1 Kit
de novo sequencing	+	✔
Resequencing	+	✔
Sequencing difficult templates	+	+
Long-read sequencing	+	✔
Sequencing across all template types (plasmids, PCR products, BACs, and fosmids)	+	✔
Mixed-base detection	+	✔
Sequencing short PCR products using rapid electrophoresis run modules	✔	+

+ Recommended ✔ Satisfactory

Table 1. Chemistry Options

Easy Integration

The dyes in the new BigDye Terminator v3.1 and v1.1 kits are the same as those in the v3.0 and v1.0/v2.0 kits respectively, and thus, no new software or instrument recalibration is required for data analysis. Therefore, researchers can easily integrate both new versions into their workflow and take advantage of the benefits these new chemistries provide.

BigDye® Terminator v3.1 Chemistry

The BigDye Terminator v3.1 Cycle Sequencing Kit is a robust, highly flexible chemistry, designed for the majority of applications, including *de novo* sequencing and resequencing. The BigDye Terminator v3.1 kit generates data with uniform peak heights and optimized signal balance to produce long, high-quality reads. Improved peak patterns also contribute to more accurate base assignments for heterozygote and mutation detection. The chemistry's robust formulation is successful with a wide variety of templates, including PCR products, plasmids, and large insert clones, such as fosmids and bacterial artificial chromosomes (BACs). The BigDye Terminator v3.1 kit provides researchers with a higher success rate than the BigDye Terminator v3.0 kit, particularly with difficult to

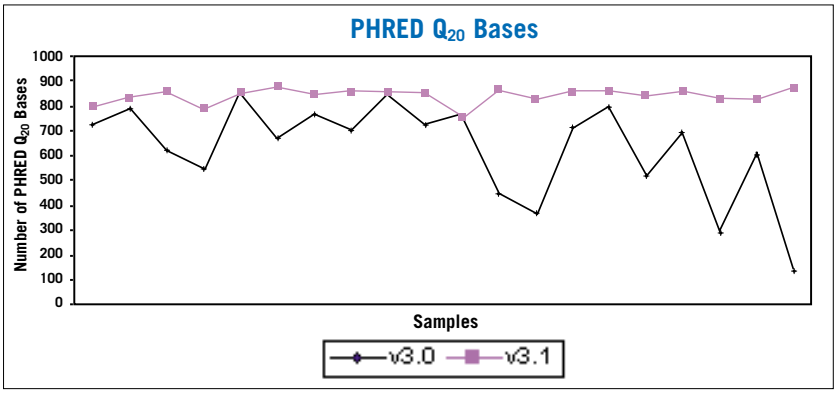

Figure 1. Longer, higher quality reads with the BigDye® Terminator v3.1 kit. The BigDye Terminator v3.1 kit generates data with an improved average number of PHRED Q_{20} bases. A library of "difficult" templates was sequenced in a customer's laboratory according to their standard protocol using the 3730*xl* DNA Analyzer. Samples using BigDye® Terminator v3.0 chemistry generated on average 629 Q_{20} bases, while samples using BigDye Terminator v3.1 chemistry generated on average 840 Q_{20} bases. (Data courtesy of Agencourt.)

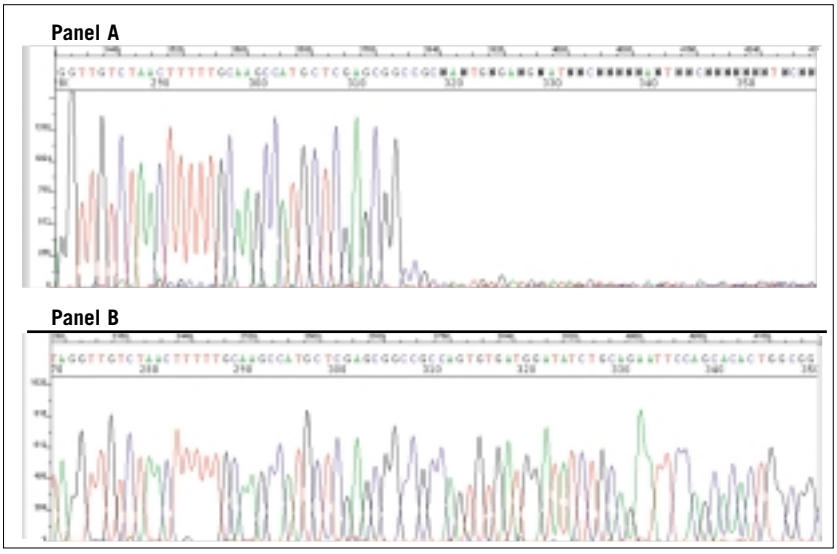

Figure 2. Improved Performance on Difficult Templates with BigDye® Terminator v3.1. A sample was run in a customer's laboratory according to their standard protocol. With the BigDye® Terminator v3.0 kit the reaction is terminated by an unknown sequence context (Panel A), while the reaction prepared with the BigDye Terminator v3.1 kit continues to read through the sample (Panel B). (Data courtesy of Agencourt.)

sequence templates, and requires only minimal changes to the current BigDye Terminator v3.0 kit protocol.

BigDye Terminator v1.1 Chemistry

The BigDye Terminator v1.1 Cycle Sequencing Kit is designed for specialty applications that require optimal basecalling adjacent to the primer. The v1.1 chemistry is an excellent choice for sequencing short PCR product templates with rapid electrophoresis run modules. With better peak-height uniformity than its v1.0 predecessor, the new v1.1 kit provides very good mixed-base detection. Like the v3.1 chemistry, the v1.1 chemistry is designed for superior robustness and provides dependable, reproducible results with a wide variety of templates. The new v1.1 protocol recommends only minimal changes to the v1.0 version.

Choosing the Right DNA Sequencing Chemistry

BigDye Terminator v3.1 and v1.1 kits allow researchers to choose the optimal chemistry for a wide range of applications. Table 1 provides guidelines for selecting the appropriate cycle sequencing kit. If your laboratory is interested in the most robust, flexible chemistry that will generate the longest reads, then you would prefer the v3.1 kit. If your lab is primarily sequencing short PCR fragments using rapid electrophor-

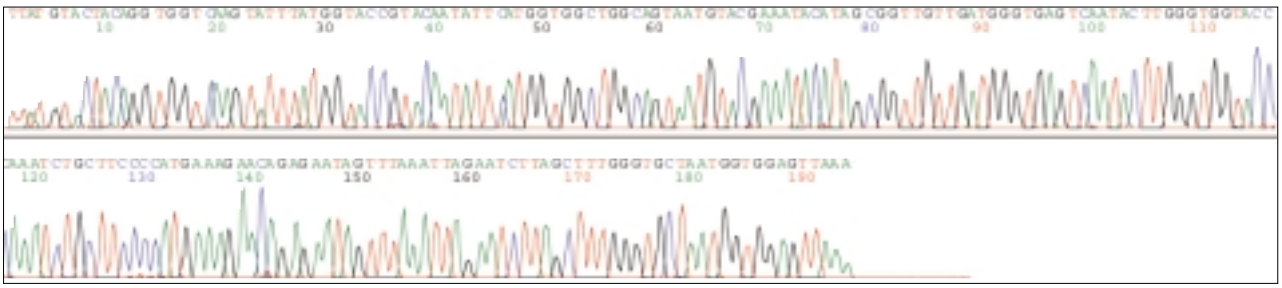

Figure 3. Short PCR Product Sequencing with BigDye® Terminator v1.1. The v1.1 kit successfully sequences a short PCR product generated from human mitochondrial DNA. The PCR product shows 100% basecalling accuracy beginning with the first base adjacent to the primer. The sample was run on the 3100 Genetic Analyzer using POP-6™ Polymer.

esis run modules, then you would prefer the v1.1 kit. Many variables contribute to DNA sequencing data quality, including template type, instrument module, total signal, peak-height uniformity, and mobility shift. All should be taken into consideration when selecting the most appropriate chemistry.

Guaranteed Performance

All BigDye sequencing reagents are tested twice for quality—first for correct formulation and then for consistent, reliable performance on our sequencing systems. Additionally, Applied Biosystems expert field and telephone support teams are readily available to answer your questions and provide whatever assistance you require.

Specifications

BigDye® Terminator v3.1 and v1.1 Cycle Sequencing Kits include all required reagents for sequencing 24, 100, 1,000, 5,000, or 25,000 single-stranded (ss) or double-stranded (ds) DNA templates. The reagents in each kit are optimized for use with the ABI PRISM® 310, 3100, and 3100–*Avant* Genetic Analyzer; the 3700, 3730, and 3730*xl* DNA Analyzer, and the 377 DNA Sequencer.

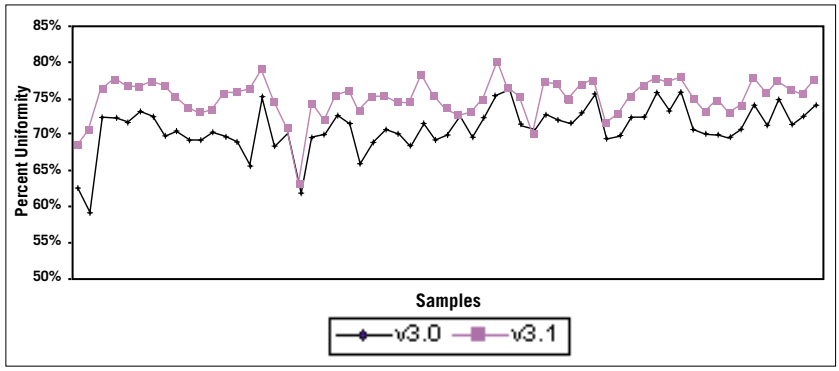

Figure 4. Improved uniformity of peak heights. BigDye® Terminator v3.1 chemistry generates data with improved peak height uniformity in customer samples. Peak height uniformity is defined as local peak height consistency of analyzed data. 100% peak height uniformity represents an idealized situation where all analyzed data peaks are of equivalent height. Improved uniformity contributes to longer, higher quality reads and more accurate mixed base detection.

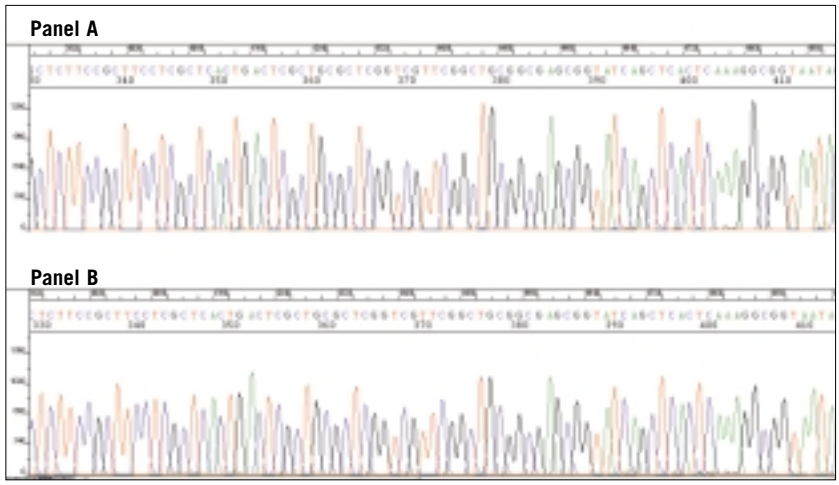

Figure 5. Improved uniformity of peak heights with BigDye® Terminator v3.1 kit. Panel A shows data from a sample sequenced using the BigDye® Terminator v3.0 kit. Panel B shows the same sample run under identical conditions with the BigDye Terminator v3.1 kit. The uniformity of the data produced with the v3.0 sample is 72% whereas the uniformity for the v3.1 sample is 76%.

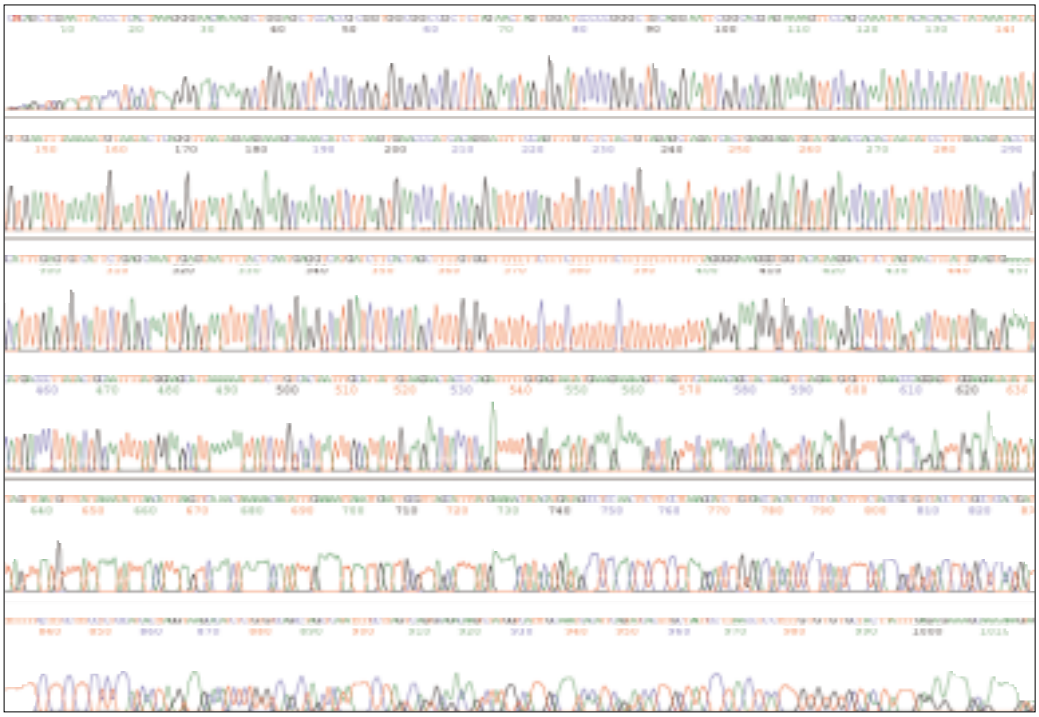

Figure 6. Longer Read Lengths with BigDye® Terminator v3.1 on the 3100 Genetic Analyzer. This figure shows accurate basecalling for more than 1,000 bases; the first ambiguity is not seen until base 1,040. The sample was run on the ABI PRISM® 3100 Genetic Analyzer with an 80 cm array using POP-4™ Polymer and the standard run module.

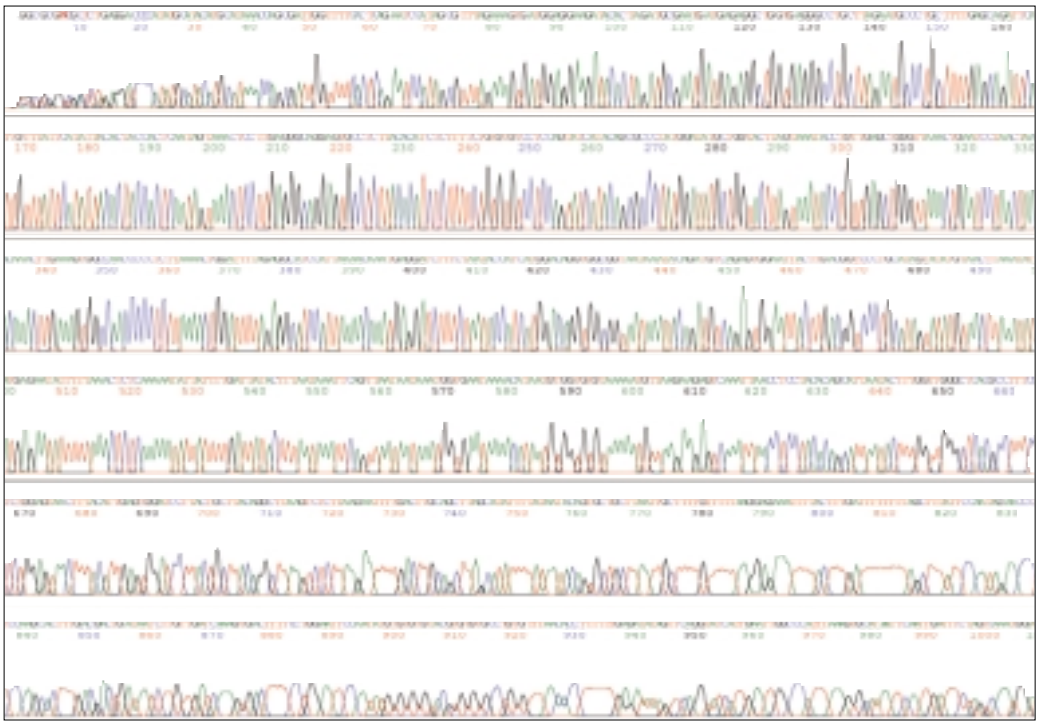

Figure 7. Longer Read Lengths with BigDye® Terminator v3.1 on the 3730*xl* Genetic Analyzer. The plasmid insert, beginning at base 23, shows accurate basecalling for more than 1,000 bases. The first ambiguity occurs at base 1,031. The sample was run on an Applied Biosystems 3730*xl* Genetic Analyzer with a 50 cm array using POP-7™ Polymer and the standard run module.

Ordering Information

BigDye® Terminator v3.1 Cycle Sequencing Kit

Ready Reactions	P/N
24	4337454
100	4337455
1,000	4337456
5,000	4337457
25,000	4337458

BigDye® Terminator v1.1 Cycle Sequencing Kit

Ready Reactions	P/N
24	4337449
100	4337450
1,000	4337451
5,000	4337452
25,000	4337453

BigDye® Terminator v3.1 Sequencing and Matrix Standards*

Description	P/N
BigDye® Terminator v3.1 Sequencing Standard	4336935
3700/3730 BigDye® Terminator v3.1 Sequencing Standard	4336943
310/377 BigDye® Terminator v3.1 Matrix Standards	4336948
3100 BigDye® Terminator v3.1 Matrix Standard	4336974
3700/3730 BigDye® Terminator v3.1 Matrix Standard	4336975

*Spatial/Spectral recalibration is not required to use v3.1 chemistry if currently using v3.0 files

BigDye® Terminator v1.1 Sequencing and Matrix Standards*

Description	P/N
BigDye® Terminator v1.1 Sequencing Standard	4336791
3700/3730 BigDye® Terminator v1.1 Sequencing Standard	4336799
310/377 BigDye® Terminator v1.1 Matrix Standards	4336805
3100 BigDye® Terminator v1.1 Matrix Standard	4336824
3700/3730 BigDye® Terminator v1.1 Matrix Standard	4336825

*Spatial/Spectral recalibration is not required to use v1.1 chemistry if currently using v1.0 or v2.0 files

BigDye® Terminator v1.1/v3.1 Sequencing Buffer (5X)

Quantity	Description	P/N
1 mL	BigDye® Terminator v1.1/v3.1 Sequencing Buffer (5X)	4336697
28 mL	BigDye® Terminator v1.1/v3.1 Sequencing Buffer (5X)	4336699
233 mL	BigDye® Terminator v1.1/v3.1 Sequencing Buffer (5X)	4336701

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Headquarters
850 Lincoln Centre Drive
Foster City, CA 94404 USA
Phone: 650.638.5800
Toll Free: 800.345.5224
Fax: 650.638.5884

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