Accurate genetic testing.

It's in our DNA.

New, innovative Smart Deep Basecaller Software

Gain clarity and confidence in Sanger sequencing results

The Applied Biosystems™ Smart Deep™ Basecaller Software is an innovative new basecalling algorithm that allows you to obtain improved Sanger sequencing output with reduced manual review time. The Smart Deep Basecaller is available for use in Applied Biosystems™ DNA Sequencing Analysis Software v8.

Compared to Applied Biosystems™ KB™ Basecaller Software, Smart Deep Basecaller provides:

• **Increased read lengths** with higher-quality basecalls at 5´- and 3´-ends (Figure 1)

• **More accurate** pure and mixed basecalls

• **Improved basecalling accuracy** and robustness through artifacts such as dye blobs, N-1 peaks, mobility shifts, and difficult sequences such as GC-rich templates (Table 1)

• **New, advanced algorithm** to support basecalling through heterozygous insertion-deletion (het indel) variants (Figure 2)

• **Reduced manual review time**—fewer edits and fewer false positives

• **Optional enhanced view trace visualization** with a cleaned-up baseline and increased resolution in the 3´-end of plasmid (pure base) sequences

Figure 1. Increased throughput with longer reads. By producing more accurate basecalls with higher quality scores, Smart Deep Basecaller generates longer read lengths after quality trimming. Datasets were provided for the Applied Biosystems™ SeqStudio™ Flex Genetic Analyzer, Applied Biosystems™ 3730 DNA Analyzer, Applied Biosystems™ SeqStudio™ Genetic Analyzer, and Applied Biosystems™ 3500 Genetic Analyzer. The data show read lengths were increased 9–16%. The advanced algorithm in Smart Deep Basecaller allows for greater accuracy in the 5´- and 3´-ends to optimize the number of bases per read.
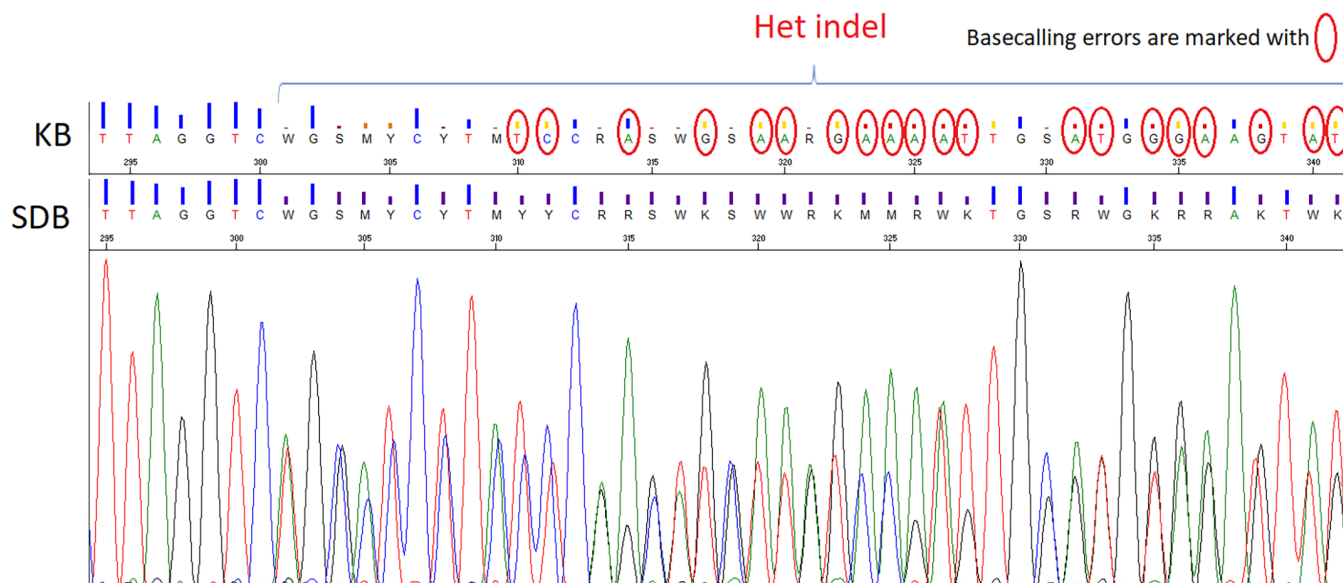
Figure 2. Smart Deep Basecaller outperforms KB Basecaller by correctly basecalling through the het indel region with high-quality values.

Table 1. Greater robustness. Based on 164 SeqStudio Genetic Analyzer samples containing artifacts such as dye blobs, N-1 peaks, and mobility shifts, the Smart Deep Basecaller results provide a 100% false negative reduction and 94% false positive reduction compared to KB Basecaller.

	Minimal QV* (QV 1) trimming		QV 20 trimming		QV 30 trimming	
Basecaller	KB Basecaller	Smart Deep Basecaller	KB Basecaller	Smart Deep Basecaller	KB Basecaller	Smart Deep Basecaller
Mixed reference positions	185	185	182	185	173	183
Mixed called positions	749	211	441	202	307	192
Correct mixed calls	166	185	163	185	158	183
False negatives	19 (10.3%)	0 (0.0%)	19 (10.4%)	0 (0.0%)	15 (8.7%)	0 (0.0%)
False positives	583 (74.7%)	26 (11.5%)	278	17 (8.0%)	149	9 (1.4%)
Indel errors	0	0	0	0	0	0
False negative reduction	100%		100%		100%	
False positive reduction	95.5%		93.9%		94.0%	

* QV = quality value

Learn more at **thermofisher.com/smartdeep**

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