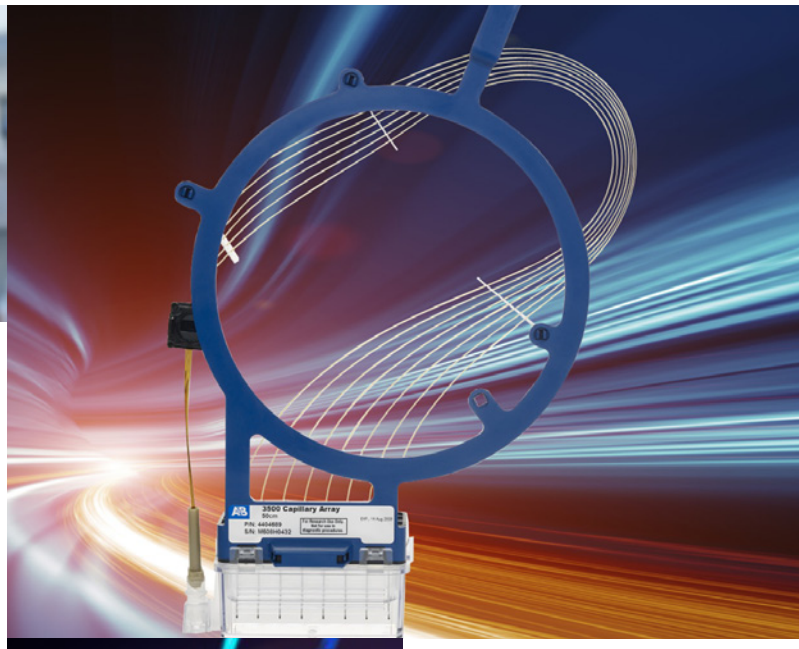
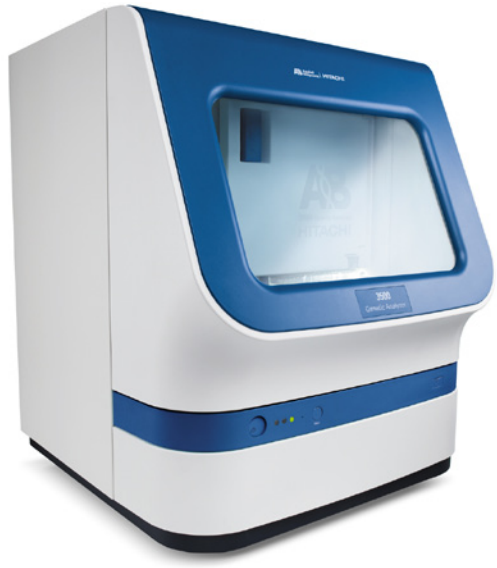
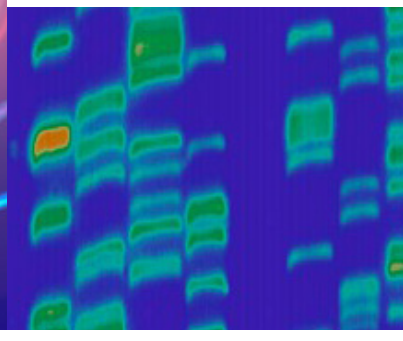
applied biosystems®
by life technologies™







Capillary Electrophoresis Products

Contents

Contents

Introduction

Capillary Electrophoresis

Applied Biosystems (now part of Life Technologies) has been a pioneer in the field of genetic analysis for over 25 years. Our capillary electrophoresis (CE) Sanger sequencing instruments were the first to sequence the human genome, paving the way for a new era of genomic study. Applied Biosystems® genetic analyzers are now a fundamental research and validation tool for life scientists, and new discoveries are made with our systems every day. The most widely published technology for DNA sequence analysis, Applied Biosystems® capillary electrophoresis instruments are cited in over 15,000 publications to date.

Capillary electrophoresis remains the industry standard for both DNA sequencing and fragment analysis. Numerous Sanger sequencing, fragment sizing, and quantification-based applications are addressed with high reliability and efficiency using this technique. Even as next-generation sequencing (NGS) platforms become more readily accessible and less complicated, researchers continue to choose CE Sanger sequencing as their primary method for confirming NGS sequencing results (visit www.lifetechnologies.com/sanger for more information). In addition, capillary electrophoresis enables many fragment analysis applications that are currently unavailable with other sequencing technologies.

Supporting life science researchers in both academia and industry, Life Technologies has a genetic analysis system to fit most applications and throughput needs. We are dedicated to expanding our genetic analysis applications portfolio to address the evolving needs of your research environment. Life Technologies is proud to offer whole-system solutions that include gold-standard capillary electrophoresis instrumentation, reagents, consumables, analysis software, and world-class application and technical support to address the unlimited potential of scientific discovery.

Sequencing

Many DNA sequencing approaches follow a similar basic workflow as shown in Figure 1. First, DNA samples are isolated and purified. Target segments of the DNA are amplified by PCR and purified. Then, cycle sequencing is performed using dye primer– or dye terminator–based sequencing chemistries. After a subsequent clean-up step, samples are loaded on an Applied Biosystems® genetic analyzer for separation by electrophoresis and primary data analysis. Secondary analysis software programs are used for additional data analysis and interpretation.

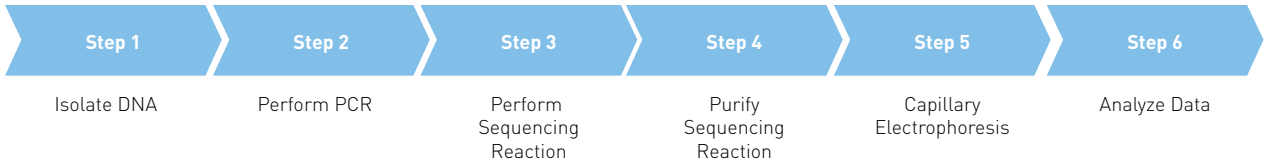


Figure 1. Step-by-step guide to DNA sequencing.

Step 1: Isolate the DNA

The isolation of high-quality DNA is a critical initial step in any DNA analysis application, including DNA sequencing. The DNA isolation method a researcher chooses will vary depending on the tissue type (including blood), how it was obtained from its source, and how the sample was handled or stored prior to extraction.

Step 2: Perform PCR: primer design, amplification, and PCR clean-up

PCR amplification of DNA samples is required for most DNA sequencing workflows. Life Technologies provides innovative tools to streamline primer design and subsequent amplification for specific applications.

- More than 420,000 predesigned PCR primer pairs for nearly 16,000 human genes were designed by Applied Biosystems and are available free on NCBI. All primer pairs are designed for universal PCR and sequencing conditions. More details on how to find primer sequences on NCBI can be found on page 6.
- Primer design software, such as OligoPerfect™ Designer (available at vwww.invitrogen.com/oligoperfect), can automatically evaluate a target sequence and design primers. The free Methyl Primer Express® Software v1.0 helps design high-quality PCR primers for methylation mapping experiments. The tool searches for CpG islands and simulates bisulfite modification of the DNA region of interest.
- The PCR reaction is performed using two PCR primers or tailed primers (like the M13-tailed primers), an AmpliTaq® DNA Polymerase, four dNTPs, and a buffer.
- After the PCR step and before the sequencing step, PCR products are purified to remove excess dNTPs and primers.

Step 3: Perform the sequencing reaction

BigDye® terminator cycle sequencing (V3.1 or V1.1) is performed in a single reaction tube by mixing together the

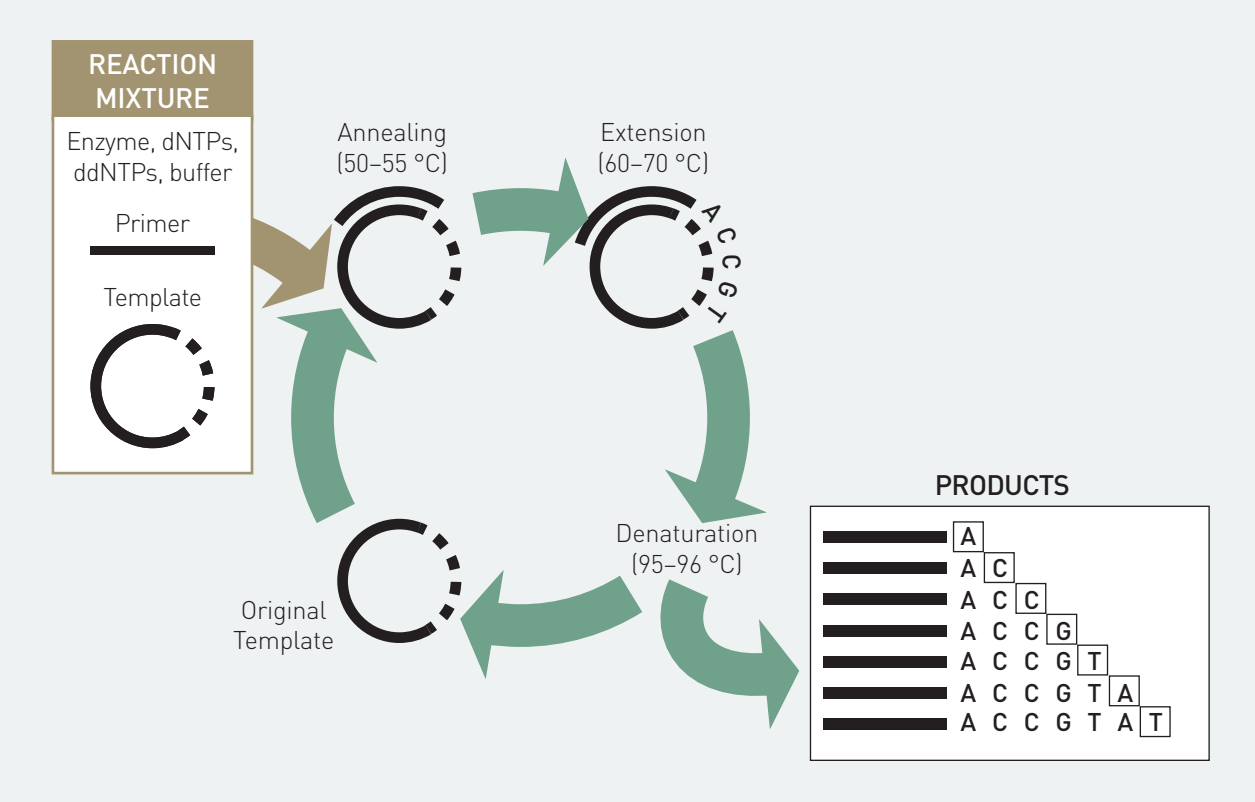


Figure 2. PCR cycle sequencing.

DNA template, one unlabeled primer (typically it is the same as the PCR primer or its M13 primers), and the BigDye® Terminator reaction mix (contains buffer, the four dNTPs, the four fluorescently labeled ddNTPS, and the AmpliTaq® DNA Polymerase). Cycle sequencing (Figure 2) entails successive rounds of denaturation, annealing, and extension of sample DNA in a thermal cycler that results in linear amplification of extension products from the DNA sample. Fluorescent fragments are generated by incorporation of dye-labeled ddNTPs. Each ddNTP (ddATP, ddCTP, ddGTP, or ddTTP) will carry a different color of dye, and correspond to either A, C, G, or T at the 3´ end.

BigDye® Direct Cycle Sequencing Kit. In 2011, the BigDye® Direct Cycle Sequencing Kit introduced an important modification in the sequencing protocol by providing a one-step PCR clean-up and sequencing reaction. Combined with M13-tailed primers, it streamlines the sequencing workflow and provides high-quality data. Learn more about the BigDye® Direct Cycle Sequencing Kit on page 32.

Step 4: Purify the sequencing reaction

After the sequencing reaction, it is important to remove unincorporated dye terminators and salts prior to capillary electrophoresis. Excess salt translates to poor signal-to-noise ratios, and unincorporated terminators can co-migrate with the sequencing template, resulting in basecalling errors. The BigDye XTerminator® Purification Kit is a fast, simple purification method for sequencing reactions that affords high-quality data for long reads, strong signal, and superior short fragment recovery. In addition, Life Technologies also offers the Centri-Sep™ System for sample clean-up in several configurations: individual columns, 8-well strips, and 96-well plates.

Step 5: Capillary electrophoresis

After performing the post-sequencing reaction purification, samples are ready for analysis on a capillary electrophoresis instrument. Applied Biosystems® capillary electrophoresis–based genetic analyzers are globally renowned for proven performance and reliability. During capillary electrophoresis, the products of the cycle sequencing reaction are injected electrokinetically into capillaries filled with polymer. A high voltage is applied so that the negatively charged DNA fragments move through the polymer in the capillaries toward the positive electrode. Capillary electrophoresis can resolve DNA molecules that differ in molecular weight by only one nucleotide. Shortly before reaching the positive electrode, the fluorescently labeled DNA fragments, now separated by size, move through the path of a laser beam. The laser beam causes the dyes on the fragments to fluoresce. An optical

detection device on Applied Biosystems® instruments detects the fluorescent signal produced. The Data Collection Software converts the fluorescent signal to digital data, and records the data in an *.ab1 file.

Step 6: Analyze the data using Sequencing Analysis Software

Life Technologies offers a suite of secondary analysis software packages. Sequencing Analysis Software, used in conjunction with the KB™ Basecaller Software, allows users to basecall and re-basecall, trim data ends, as well as display, edit, and print sample files. The free Sequence Scanner Software enables you to view, edit, print, and export sequence data generated using Applied Biosystems® genetic analyzers. The software is user-friendly and easily generates graphically expressive reports on results. SeqScape® Software v2.6 is designed for reference-based analysis, and Variant Reporter® software is designed for reference-based and non–reference-based analysis. Both are used for mutation detection and analysis, SNP discovery and validation, pathogen subtyping, allele identification, and sequence confirmation.

For more information on the sequencing workflow, go to www.lifetechnologies.com/cesequencing.

Sequencing Application Compatibility

		Instrument						
	Sequencing Application	**3730xl**	**3730**	**3500xL**	**3500**	**3130xl**	**3130**	**310**
	***De Novo* Sequencing**	S	S	S	S	S	S	S
Resequencing	**General Resequencing for Mutation Detection**	S	S	S	S	S	S	A
Resequencing	**NGS Sequence Confirmation**	C	C	C	C	C	C	C
Resequencing	**Methylation Sequencing**	S	S	S	S	S	S	C
Resequencing	**Checking Clone Constructs**	S	S	S	S	S	S	S
Resequencing	**BAC End Sequencing**	S	S	S	S	S	S	S
Resequencing	**HLA Typing**	N	N	S	S	S	S	C
Resequencing	**mtDNA Sequencing**	S	S	S	S	S	S	S
Resequencing	**Viral Genotyping**	C	C	C	C	C	C	C
Resequencing	**Microbial and Fungal Identification**	S*	S*	S	S	S	S	S*
Resequencing	**MLST**	A	A	A	A	A	A	A
Resequencing	**SAGE**	S	S	S	S	S	S	C

AB Supported (S). Testing and optimization has been performed by Applied Biosystems to validate this application on this system. Technical support and field application specialists have been trained to support this application. Applied Biosystems provides the whole-system solution for this application, including software, reagents, and instruments. AB Supported [S*]: denotes that the instrument does not include a system IQ/OQ or validation procedure.

AB Demonstrated (A). Applied Biosystems has tested this application but no optimization was performed for this instrument. This instrument can perform this application without apparent negative effects on instrument components. Certain components of the application workflow, such as data analysis software, reagent kits, and the reagent preparation protocol may not be available through Applied Biosystems. Supporting documentation such as Application Notes are available from Applied Biosystems or third parties.

Customer Demonstrated (C). This application has not been tested on this instrument by Applied Biosystems. However, at least one customer or third party has successfully performed this application on this instrument. Applied Biosystems cannot guarantee the application will not adversely affect the functionality of the instrument or other Applied Biosystems products. However, supporting third-party documentation is available and Applied Biosystems will attempt to assist in enabling this application.

Not Supported (N). This application has not been tested on this instrument by any parties. Applied Biosystems cannot guarantee the application will not adversely affect the functionality of the instrument or other Applied Biosystems products. Data generated by this application on this instrument may not be reliable. Applied Biosystems does not provide support for this application.

Sequencing Applications Overview

CE Sanger sequencing applications fall into two main categories: *de novo* sequencing and resequencing. *De novo* sequencing is used to generate the sequence of a DNA molecule without any prior information about the sequence. Resequencing, which is essentially sequencing of PCR products or cloned products, is the basis of many sequencing applications such as mutation detection (SNP, insertions, deletions), NGS sequence confirmation, methylation sequencing, mitochondrial sequencing, HLA typing, microbial and fungal identifications, and so on.

De Novo Sequencing

For *de novo* sequencing using capillary electrophoresis, the target DNA is fragmented and cloned into a viral or plasmid vector. Cloning provides amplification of the target DNA (by bacterial growth) and allows sequencing primers to bind to a known sequence in the vector and extend the sequence into the unknown target DNA. *De novo* sequencing methods are described in the Chemistry Guide for Sequencing (www.lifetechnologies.com/cechemistryguide) on pages 16–20.

Resequencing

Resequencing is defined as the sequencing of DNA molecules followed by comparison to a known or reference sequence. Resequencing or directed sequencing is used for the discovery of sequence variants usually associated with a phenotypic change, for determining evolutionary changes, and/or for biological identification. Resequencing may be focused on coding regions of genes implicated in disease, or it may target the whole genome for the discovery of SNPs and other sequence variations between individuals. Comparative sequencing is usually defined as sequencing a specific region in different species or subspecies to identify highly conserved regions. Resequencing is often carried out by amplifying a specific region of the genome by PCR and then sequencing the PCR fragment from both directions to generate a high-quality DNA sequence. Information about the different strategies for resequencing are described below and in the Chemistry Guide for Sequencing (www.lifetechnologies.com/cechemistryguide) on pages 20–23.

NGS Sequence Confirmation

Sanger sequencing is the gold standard for the confirmation of next-generation sequencing results. This is typically accomplished by the Sanger sequencing of PCR products that correspond to regions of interest identified using next-generation sequencing.

Methylation Sequencing

Methylation of a CpG residue can be determined by treating genomic DNA with sodium bisulfite that converts unmethylated cytosine to uracil, while methylated cytosine is protected from bisulfite conversion. Comparing the sequence of bisulfite-converted DNA with untreated DNA clearly indicates the presence of methylated C residues, because they appear as C in bisulfite-converted DNA. Unmethylated C is converted to U (and to T in the sequencing reaction), so it appears as T. In principle, there are two approaches to methylation depending upon available information and research goals: methylation-specific PCR or bisulfite-specific PCR. A researcher performs bisulfite treatment in order to transform an epigenetic event to a detectable, permanent genetic change *in vitro*, because the original methylation is lost during PCR.

Comparison of sodium bisulfite–treated DNA sequences with sequences obtained from untreated genomic DNA allows the precise identification of all methylated cytosines within a long stretch of DNA. Two options are available for collecting methylation sequencing data. Both options require bisulfite conversion and PCR amplification, but in one method the PCR fragments are sequenced directly, while in the other method the fragments are cloned and then the clones are sequenced. Methylation sequencing methods are described in the Chemistry Guide for Sequencing (www.lifetechnologies.com/cechemistryguide) on pages 23–26.

Checking Clone Constructs

Refers to verifying that the DNA of interest has been properly cloned into the vector by sequencing.

BAC End-Sequencing

Bacterial artificial clones (BACs) are large segments (100–200 kb bases) of DNA cloned into bacteria from another species. Multiple copies can be made after cloning. Sequences from the BAC ends provide highly specific markers. These sequences can then be queried against BAC libraries for confirmation.

HLA Typing

The human leukocyte antigen (HLA) test detects antigens (genetic markers) in white blood cells. The four types of human leukocyte antigens are: HLA-A, HLA-B, HLA-C, and HLA-D. The HLA test checks tissue compatibility and recipient/donor tissue typing.

mtDNA Sequencing

Mitochondrial DNA molecules are present in hundreds to thousands of copies per cell, rather than the nuclear complement of two copies per cell. This abundance and stability allows discrimination among individuals or biological samples for which the amount of DNA is limited. Mutations in mitochondrial DNA are also implicated in neurological diseases (Lax NZ et al. 2011, *Neuroscientist* 17:645).

Viral Genotyping

Many viral genomes mutate rapidly and often. Sequencing using capillary electrophoresis can be used to precisely

characterize and compare these variations for many types of research studies including, but not limited to, viral strain identification, evolution, and drug response.

Microbial and Fungal Identification

Molecular identification of bacteria, fungi, mold, and yeast species using PCR and DNA sequencing.

MLST (Multi-Locus Sequencing Typing)

An unambiguous procedure for characterizing bacterial isolates using the sequences of internal fragments from seven housekeeping genes. The procedure uses internal fragments (~450–500 bp) of each gene, as they can be accurately sequenced on both strands with an automated genetic analyzer. For each housekeeping gene, the sequences present within a bacterial species are assigned as distinct alleles, and for each isolate the alleles at each of the seven loci define the allelic profile or sequence type (ST).

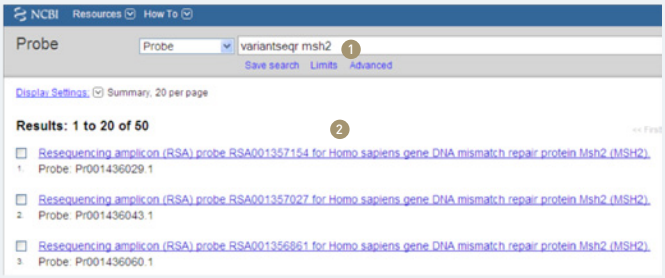
SAGE™ (Serial Analysis of Gene Expression) Method

Method for quantitative, genome-wide gene expression pattern analysis. A short sequence tag (10–25 bp) contains sufficient information to identify a transcript.

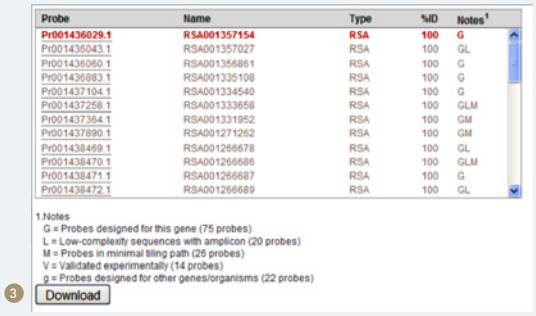
Resequencing Human Genes with VariantSEQr® Primers

The primer sequences for the Resequencing Amplicons (RSA) that make up a Resequencing Set (RSS) for a gene are available on the NCBI Probe database, http://www.ncbi.nlm.nih.gov/probe.

1. In the search box, type in "variantseqr" and the gene symbol, Locus Link ID, RSS ID, or an RSA ID and click Search.
2. Click on an "RSA" link in the results page to open the RSA page.



3. Click the Download button located at the bottom of the first RSA page to access all PCR primers for that gene.



4. All Resequencing Amplicons (represented by a rectangle) are aligned to the gene structure. The RSS ID (Resequencing Set ID) references a set of RSAs that provide the most efficient coverage (smallest number of RSAs for the region). Primers to a specific transcript can be selected by clicking the rectangle (red when selected). The M13 tail, included by default in the primer sequence, can be removed by checking the "Hide M13 Primers" box.

5. Click the Download button to export the primer sequences as a tab-delimited file.

Fragment Analysis

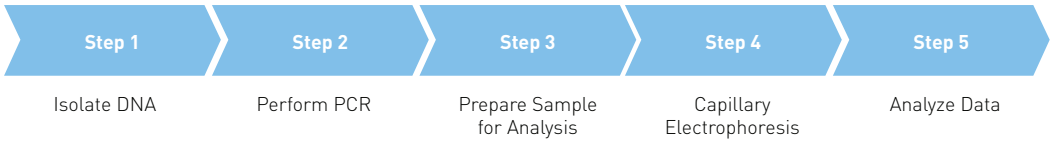


Figure 3. Step-by-step guide to general fragment analysis.

Applied Biosystems® genetic analyzers not only have the ability to perform sequencing by capillary electrophoresis but also can perform a variety of additional DNA analysis applications based on the sizing or sizing and intensity of fluorescently labeled DNA fragments. Collectively, these applications are referred to as "fragment analysis".

Among these fragment analysis applications are: microsatellite or short tandem repeat (STR) analysis, amplified fragment length polymorphisms (AFLP®) analysis, terminal restricted fragment length polymorphism (T-RFLP) analysis, bacterial artificial chromosome (BAC) fingerprinting, loss of heterozygosity (LOH), SNP genotyping (SNaPshot®), and gene expression profiling applications like HiCEP.

Several of these highly useful molecular biology applications utilize a general fragment analysis workflow as shown in Figure 3. For a specific application workflow, go to www.lifetechnologies.com/fa.

In general, fragment analysis applications are used to generate a size estimate for DNA fragments relative to a size standard with DNA fragments of known length. The size standard is combined with the sample of interest, and is co-injected on the capillary electrophoresis system. The general steps of a fragment analysis workflow include: isolating the DNA, performing PCR to label the DNA fragments with a fluorescent dye, preparing the sample for analysis, performing capillary electrophoresis to separate and detect the DNA fragments, and subsequent data analysis using the appropriate genotyping software.

Step 1: DNA isolation

Sample preparation and DNA isolation can be achieved in a similar manner as described in the sequencing section.

Step 2: Perform PCR to label DNA fragments with a fluorescent dye

After DNA extraction, a PCR step for amplification is often included as an initial step of many fragment analysis protocols. PCR is used to amplify the target DNA to be analyzed, and can also label the DNA fragment by using fluorescently labeled PCR primer(s).

Depending on the instrument, dye sets, and applications you are using, different dyes are available (Table 1).

Step 3: Prepare the sample for analysis

After PCR, PCR products are combined (multiplexed) together with formamide and a size standard. This size standard is a collection of DNA fragments labeled with a specific dye, such as ROX™ or LIZ® dye. Multiplexing can be done by size and by color, and allows analysis of multiple PCR products in a single tube. Multiplexing can also be performed during PCR but requires more optimization.

Step 4: Capillary electrophoresis

Both the dye-labeled sample and size standard fragments are co-injected and separated based on size and charge as they move through the capillary filled with polymer. As each of the fluorescently labeled sample and size standard fragments moves across the laser window and fluoresces, the signal produced is detected by an optical detection device on the instrument. The Data Collection Software then reports the DNA fragments. Since the sample and size

Table 1. Dye sets for fragment analysis. Combinations listed by filter.

Filter	Blue	Green	Yellow	Red	Orange
D6	FAM™	HEX™	NED™	ROX™	NA
G5	6-FAM™	VIC®	NED™	PET®	LIZ®
F	5-FAM™	JOE™	NED™	ROX™	NA
D**	6-FAM™	VIC®	NED™	ROX™	NA
E5	dR110	dR6G	dTAMRA™	dROX™	LIZ®

standard fragments are labeled with four to five distinct dyes, it is possible for samples of the same or similar size to be co-electrophoresed. Life Technologies offers several capillary electrophoresis platforms with various throughput options to help meet every laboratory's specific needs.

Step 5: Data analysis using appropriate software

Basic data collection occurs during a capillary electrophoresis run. After data collection, secondary analysis software is used to analyze the data. Applied Biosystems® GeneMapper® Software is a flexible, high-performance software package that can be used for a variety of fragment analysis

Fragment Analysis Application Compatibility

	Instrument						
Fragment Analysis Application	**3730xl**	**3730**	**3500xL**	**3500**	**3130xl**	**3130**	**310**
General sizing of PCR products	S	S	S	S	S	S	S
Fragment length polymorphisms	S	S	S	S	S	S	S
• AFLP®	S	S	S	S	S	S	S
• RFLP/tRFLP	A	A	A	A	A	A	A
Conformation analysis							
• SSCP	N	N	N	N	A	A	S
Large fragment analysis							
• BAC fingerprinting	A	A	A	A	A	A	S
• VNTR	C	C	C	C	C	C	C
Microsatellite							
• Genotyping	S	S	S	S	S	S	S
• Analysis for forensics/HID	N	N	S	S	S	S	S
• Linkage mapping	S	S	S	S	S	S	S
• Instability/RER	A	A	A	A	A	A	A
Relative fluorescent quantitation							
• LOH	S	S	S	S	S	S	S
• MLPA	C	C	C	C	C	C	C
• MSMSA	A	A	A	A	A	A	A
SNP genotyping							
• SNaPshot® system	A	A	S	S	S	S	S
DNA–protein binding assays and DNA fingerprinting	C	C	C	C	C	C	C
Gene expression profiling							
• HiCEP	N	N	C	C	N	N	N

AB Supported (S). Testing and optimization has been performed by Applied Biosystems to validate this application on this system. Technical support and field application specialists have been trained to support this application. Applied Biosystems provides the whole-system solution for this application, including software, reagents, and instruments.

AB Demonstrated (A). Applied Biosystems has tested this application but no optimization was performed for this instrument. This instrument can perform this application without apparent negative effects on instrument components. Certain components of the application workflow, such as data analysis software, reagent kits, and the reagent preparation protocol may not be available through Applied Biosystems. Supporting documentation such as Application Notes are available from Applied Biosystems or third parties.

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Not Supported (N). This application has not been tested on this instrument by any parties. Applied Biosystems cannot guarantee the application will not adversely affect the functionality of the instrument or other Applied Biosystems products. Data generated by this application on this instrument may not be reliable. Applied Biosystems does not provide support for this application.

applications such as those based on microsatellites, fragment length polymorphisms, and SNP genotyping. Peak Scanner™ Software is a nucleic acid sizing software that identifies peaks and fragment sizes for application-specific capillary electrophoresis assays.

Fragment Analysis Applications Overview

General Sizing of PCR Products

Allows for the determination of the size (from 30-1200 bp) of a product through the use of size standards.

Amplified Fragment Length Polymorphisms (AFLP®)

A highly sensitive method for detecting informative markers using DNA polymorphisms. Following restriction enzyme digestion of DNA, a subset of DNA fragments is selected for PCR amplification and visualization. Widely used in agricultural and microbial differentiation studies.

Restriction Fragment Length Polymorphisms (RFLPs/ tRFLPs)

RFLPs are generated by digesting DNA with restriction enzymes. The resulting fragments are separated according to size by gel electrophoresis. Slight differences in homologous fragments may exist between individuals.

Conformation Analysis-SSCP (Single Strand Conformation Polymorphism)

A method to detect a potential variant in a DNA fragment using nondenaturing electrophoretic conditions that results in a different secondary structure and a measurable difference in mobility relative to the wild type DNA.

Large-Fragment Analysis

Analysis of fragments longer than 600 bp.

- **BAC Fingerprinting:** Methods of building physical maps of chromosomes by assembling BAC fragments generated by restriction enzymatic digestion.
- **VNTR (Variable Number Tandem Repeats):** A defined region of DNA that contains multiple copies of a short sequence of bases that are repeated several times.

Microsatellite/Short Tandem Repeat (STR) Genotyping

Loci (or regions within DNA sequences) in which short DNA sequences are repeated in tandem arrays. The sequence lengths that most commonly occur are di-, tri-, or tetranucleotides.

- **Forensics/Human Identification:** Microsatellite loci (short tandem repeat (STR) loci) are widely used for forensic identification and relatedness testing.
- **Linkage Mapping:** Using STRs to identify the location of genes that cause genetic disease.
- **Instability/RER:** Additional microsatellite alleles, resulting from the inherent susceptibility of affected areas to such alterations, and from mutations in the DNA mismatch repair mechanism that normally corrects these errors.

Relative Fluorescent Quantitation

Relative fluorescent quantitation is a technique used in a variety of fragment analysis applications that require peak height (or peak area) comparisons across samples. Among these applications are screening for loss of heterozygosity using microsatellites or SNPs, aneuploidy assays, methylation assays and detection of large chromosomal deletions.

- **Loss of Heterozygosity (LOH):** A genetic event that can occur in the dividing cells of a diploid organism (heterozygous for one or more markers) in which a daughter cell becomes homozygous or hemizygous for one or more alleles through mitotic recombination, deletion, or gene conversion.
- **MLPA (Multiplex Ligation-Dependent Probe Amplification):** A technique that allows detection of DNA copy number changes of up to 40 sequences in a single reaction. This technique is based on the semiquantitative polymerase chain reaction principle, and can be applied for detecting copy number changes and methylation quantification of the genomic DNA or for mRNA profiling. MLPA is a registered trademark of MRC-Holland.
- **Methylation-Sensitive Mobility Shift Assay (MSMSA):** An application used to assess the degree of methylation present in a given amplicon.

SNP Genotyping

A single nucleotide polymorphism (SNP) is the substitution of one base for another. SNP-based genotyping enables the identification of alleles by identifying the base changes.

DNA–Protein Binding Assays/DNA Fingerprinting

Protein-binding affinity, as a function of a DNA sequence, measured by mobility shift on a capillary instrument.

High-Coverage Gene Expression Profiling (HiCEP)

The HiCEP method is a gene expression profiling method that requires no prior sequence information and has a reduced rate of false positives and a high degree of detection of both coding and noncoding transcripts.

Capillary Electrophoresis Instruments

Introduction

The Instruments That Sequenced the Genome

Applied Biosystems® capillary electrophoresis instruments are renowned globally for their proven technology, performance, and reliability. The gold standard in research laboratories around the world, these systems have been at the defining core of genetic analysis for the past quarter century. All of our automated genetic analyzers offer application-specific software, utilize our innovative BigDye® Terminator chemistry, and are backed by Life Technologies' world-class service and support. From single-capillary to large, production-scale systems, Life Technologies offers an instrument for every application and throughput level.

For more information on our full line of genetic analysis instruments, visit www.lifetechnologies.com/ce or contact your local sales representative.

Table 2. Capillary electrophoresis systems selection guide.

Specifications	310 (page 12)	3130/3130xl[1] (page 13)	3500/3500xL (page 15)	3730/3730xl (page 17)
Number of capillaries	1	4 (3130) 16 (3130xl)	8 (3500) 24 (3500xL)	48 (3730) 96 (3730xl)
Capillary array length (cm)	47, 61	22, 36, 50, 80	50	36, 50
Polymer type	POP-4®, POP-6™, CAP polymer	POP-4®, POP-6™, POP-7™, CAP polymer	POP-4®, POP-6™, POP-7™	POP-7™
Sample capacity	48 and 96 sample tubes	96- and 384-well microplates	96- and 384-well microplates	96- and 384-well microplates
Sequencing reagents	BigDye® Terminator Kits, dRhodamine Dye Terminator Kit	BigDye® Direct, BigDye® Terminator v1.1, BigDye® Terminator v.3.1	BigDye® Direct, BigDye® Terminator v1.1, BigDye® Terminator v.3.1	BigDye® Direct, BigDye® Terminator v1.1, BigDye® Terminator v.3.1
Genotyping reagents	SNaPshot® Multiplex Kit, GeneScan™ Size Standard	SNaPshot® Multiplex Kit, GeneScan™ Size Standard	SNaPshot® Multiplex Kit, GeneScan™ Size Standard (600 LIZ® v2.0)	SNaPshot® Multiplex Kit, GeneScan™ Size Standard
Integrated plate stacker	NA	NA	NA	Houses 16 sample plates (96- and 384-well formats)
Sequencing software	Sequencing Analysis Software, Variant Reporter® Software, SeqScape® Software, Sequencer Scanner Software			
Fragment analysis software	GeneMapper® Software , Peak Scanner™ Software			
Service and warranty	One-year limited warranty on parts and labor			

1. The 3130/3130xl Genetic Analyzers were discontinued in 2010. However, refurbished models are available.

Applied Biosystems® 310 Genetic Analyzer

Affordable, versatile, one capillary

- Flexibility to perform comparative sequencing, linkage analysis, STR analysis, SNP detection, discovery and validation, mutation detection, and many other applications
- Designed for continuous 24-hour hands-free automation—no gel preparation
- Simultaneous 5-dye detection
- Software for sequencing, genotyping, and fragment analysis applications
- Easy setup

Applied Biosystems® 310 Genetic Analyzer.

The 310 Genetic Analyzer is an automated, single-capillary instrument designed for a wide range of sequencing and fragment analysis applications.

The 310 Genetic Analyzer is fully compatible with Applied Biosystems® polymers, reagent kits, and software. The application-specific software suite manages instrument setup, controls instrument operations, allows real-time data visualization, and performs diagnostics. The Microsoft® Windows®-compatible platform makes it easy to upgrade the 310 system with the latest software updates.

Table 3. 310 Genetic Analyzer performance specifications.

Selected applications	Capillary	Polymer	Runs/ day	LOR (length of read)[1]	Throughput (per 24 hours)[2]
Standard sequencing	61 cm	POP-6™	9	700	5,220 bases
Rapid sequencing	47 cm	POP-4®	38	425	14,985 bases
DNA sizing	47 cm	POP-4®	48	250 (single-base detection up to 250 bases with 0.15 SD)	5-dye: 960 genotypes

1. Length of read with 98.5% basecalling accuracy, <2% N, using pGEM-32f(+) as template.
2. Assumes 20 genotypes per sample.

Product	Quantity	Cat. No.
310 Genetic Analyzer, 120 W (United States)	1 instrument	310-00-100/120-W
310 Genetic Analyzer, 240 W (Europe)	1 instrument	310-00-200/240-W
Refurbished 310 Genetic Analyzer (United States)	1 instrument	310-00-100/120WR
Refurbished 310 Genetic Analyzer (Europe)	1 instrument	310-00-200/240WR

Applied Biosystems® 3130 and 3130xl Genetic Analyzers

Flexible, ideal for a broad spectrum of applications

- Designed for continuous, unattended 24-hour operation with fully automated polymer delivery, sample injection, separation, detection, and data analysis
- Long-term reliability with extremely low maintenance requirements
- One polymer and one array for both sequencing and fragment analysis applications
- Multiple array and polymer configurations allow application-specific optimization for maximum flexibility
- Minimal setup, simple operation
- Simple hardware upgrades are available to maintain optimum system performance

The 3130 and 3130xl Genetic Analyzers deliver higher data quality, improved automation and ease of use, faster turnaround times, and greater reliability for all sequencing, resequencing, and fragment analysis applications.

The 3130 and 3130xl Genetic Analyzers are available as refurbished models only. Life Technologies provides the same level of service and support, and offers the same reagents and consumables for our refurbished systems.

Applied Biosystems® 3130 Genetic Analyzer.

Applied Biosystems® 3130xl Genetic Analyzer.

Product	Quantity	Cat. No.
3100-*Avant*™ to 3130 Genetic Analyzer Upgrade with Computer	1 unit	4396844
3100 to 3130xl Genetic Analyzer Upgrade with Computer	1 unit	4359571
3130 to 3130xl Genetic Analyzer Upgrade Kit	1 unit	4357355
3130 Genetic Analyzer (factory-refurbished)	1 instrument	3130-01R
3130xl Genetic Analyzer (factory-refurbished)	1 instrument	3130XL-R

Table 4. Sequencing run module performance and throughput specifications.

Sequencing run module	Array length (cm)	Polymer	Run time (min)	24-hr throughput[1]		KB™ Basecaller QV20 LOR[2,3]
				3130	3130xl	
UltraSeq36_POP7	36	POP-7™	35	164	656	500
RapidSeq36_POP7	36	POP-7™	60	96	384	600
UltraSeq36_POP4	36	POP-4®	40	144	576	400
RapidSeq36_POP6	36	POP-6™	60	96	384	500
FastSeq50_POP7	50	POP-7™	60	96	384	700
StdSeq50_POP7	50	POP-7™	120	48	192	850
StdSeq50_POP4	50	POP-4®	100	56	224	600
StdSeq50_POP6	50	POP-6™	150	36	144	600
LongSeq80_POP7	80	POP-7™	170	32	128	950
LongSeq80_POP4	80	POP-4®	210	24	96	700

1. Number of samples.
2. Sequencing Analysis Software v5.2 and higher provides a metric length of read (LOR), defined as the usable range of high-quality or high-accuracy bases determined by quality values (QV) generated by KB™ Basecaller Software v1.2. The LOR is determined by a sliding window of 20 bases, which have an average QV >20.
3. 98.5% basecalling accuracy, <2% N.

Table 5. Fragment analysis run module performance and throughput specifications.

Fragment analysis run module	Array length (cm)	Polymer	Run time (min)	24-hr throughput		Resolution (bp)	Performance SD[2]
				3130 GT[1]	3130xl GT[1]		
Fragment Analysis 22_POP4	22	POP-4®	20	5,760	23,040	400	0.50
SNP22_POP4	22	POP-4®	15	3,840[3]	15,360[3]	120	0.50
Fragment Analysis 36_POP7	36	POP-7™	35	3,280	13,120	500	0.15
Fragment Analysis 36_POP4	36	POP-4®	45	2,560	10,240	500	0.15
HID Fragment Analysis 36_POP4	36	POP-4®	45	2,560	10,240	500	0.15
SNP36_POP4	36	POP-4®	30	3,840	15,360	120	0.15
Fragment Analysis 50_POP7	50	POP-7™	50	2,240	8,960	500	0.15
Fragment Analysis 50_POP4	50	POP-4®	65	1,760	7,040	500	0.15
Fragment Analysis 50_POP6	50	POP-6™	90	1,280	5,120	500	0.15

1. 20 genotypes/injection.
2. Standard deviation: 1 base pair (bp) resolution at 99.99% accuracy.
3. 10 genotypes/injection.

Applied Biosystems® 3500 and 3500xL Genetic Analyzers

Accurate, reliable data quality

The 8-capillary 3500 Genetic Analyzer and the 24-capillary 3500xL Genetic Analyzer set a new standard in capillary electrophoresis. These instruments are specifically designed to support the demanding performance needs of validated and process controlled environments, while retaining the unsurpassed application versatility that life science researchers expect.

- 8-capillary system that can easily be upgraded to a 24-capillary system when you're ready
- A new, single-line, 505 nm solid-state long-life laser utilizes a standard power supply and requires no heat-removal ducting
- Powerful, integrated data collection and primary analysis software provides real-time assessment of data quality
- Radio Frequency Identification (RFID) technology tracks key consumables data and records administrative information
- Advanced multiplexing capabilities for DNA fragment analysis with up to six unique dyes
- Superior application flexibility—one array and one polymer are used for most applications
- Simple setup, operation and maintenance—our easiest genetic analyzer to run and own to date

Applied Biosystems® 3500 Genetic Analyzer.

3500xL Genetic Analyzer.

Product	Quantity	Cat. No.
3500 Genetic Analyzer	1 instrument	4440462
3500xL Genetic Analyzer	1 instrument	4440463
3500 to 3500xL Genetic Analyzer Upgrade Kit	1 unit	4426479

Table 6. Sequencing throughput and performance specifications.

Run module	Average run time (min)	Average throughput (samples/day)[1]		Configuration		Performance[2]	
		3500xL	3500	Capillary size (cm)	Polymer type	Median bases collected	KB QV20[3] CRL
RapidSeq50_POP7	≤40	≥840	≥280	50	POP-7™	≥600	≥500
StdSeq50_POP6	≤135	≥240	≥80	50	POP-6™	≥700	≥600
FastSeq50_POP7	≤65	≥504	≥168	50	POP-7™	≥750	≥700
StdSeq50_POP7	≤125	≥264	≥88	50	POP-7™	≥1,000	≥850
ShortReadSeqPOP7	≤30	≥1,104	≥368	50	POP-7™	≥325	≥300
MicroSeq_POP7	≤125	≥264	≥88	50	POP-7™	≥1,000	≥850
MicroSeq_POP6	≤135	≥240	≥80	50	POP-6™	≥700	≥600
RapidSeq_BDX_50_POP7[4]	≤40	≥840	≥280	50	POP-7™	≥600	≥500
StdSeq_BDX_50_POP6[4]	≤140	≥240	≥80	50	POP-6™	≥700	≥600
FastSeq_BDX_50_POP7[4]	≤65	≥504	≥168	50	POP-7™	≥750	≥700
StdSeq_BDX_50_POP7[4]	≤125	≥264	≥88	50	POP-7™	≥1,000	≥850
ShortReadSeq_BDX_POP7[4]	≤30	≥1,104	≥368	50	POP-7™	≥325	≥300

1. Throughput (samples/day) is determined by the total number of samples that can be run in 23 hours (allows time for sample preparation, instrument maintenance, and warm-up).
2. Reported performance in 90% of samples using long-read Sequencing Standard.
3. QV20 CRL is defined as the longest uninterrupted segment of bases with an average of QV≥20, calculated over a sliding window of 21 base pairs.
4. BDX classified run modules are optimized with the 3500 Series Systems to obtain more usable data when sequencing reactions are purified using the BigDye XTerminator® Purification Kit.

Table 7. Fragment analysis throughput specifications.

Run module	Average run time (min)	Average throughput (samples/day)[1]		Configuration	
		3500xL	3500	Capillary size (cm)	Polymer type
FragAnalysis50_POP7	40	≥840	≥280	50	POP-7™
FragAnalysis50_POP6	100	≥336	≥112	50	POP-6™
LongFragAnalysis50_POP7	125	≥264	≥88	50	POP-7™
HID36_POP4	35	≥936	≥312	50	POP-4®
HID36_POP7	26	≥1,272	≥424	50	POP-7™
SNaPshot50_POP7	30	≥1,104	≥376	50	POP-7™

1. Throughput (samples/day) is determined by the total number of samples that can be run in 23 hours (allows time for sample preparation, instrument maintenance, and warm-up).

Table 8. Fragment analysis performance specifications.

Run module	General		Sizing precision of 100% of alleles[3]			Multi-run sizing of 100% of alleles[4]		
	Resolution range[1]	Maximum size[2]	50–400 bp	401–600 bp	601–1,200 bp	50–400 bp	401–600 bp	601–1,200 bp
FragAnalysis50_POP7	40–520	≥600	<0.15	<0.30	NA	<1 bp	<2 bp	NA
FragAnalysis50_POP6	20–550	≥600	<0.15	<0.30	NA	<1 bp	<2 bp	NA
LongFragAnalysis50_POP7	40–700	≥1,200	<0.15	<0.30	<0.45	<1 bp	<2 bp	<3 bp
HID36_POP4	60–400	≥420	<0.15	NA	NA	<1 bp	NA	NA
HID36_POP7	60–400	≥420	<0.15	NA	NA	<1 bp	NA	NA
SNaPshot50_POP7	40–120	≥120	<0.50	NA	NA	<1 bp	NA	NA

1. Resolution range is defined as the range of bases over which the peak spacing interval divided by the peak width at half peak height is greater than 1. Value in ≥90% of samples.
2. Maximum size collected in ≥90% of samples.
3. Sizing precision is the standard deviation of sizes for a given allele size across all capillaries in the same run. Value in ≥90% of samples.
4. Multirun sizing specification is a measure of the precision of the 3500 System across multiple runs. For example, it would be expected that a 200 bp allele across 3 runs would have an average deviation of <1 bp in 90% of all samples.

Applied Biosystems® 3730 and 3730xl DNA Analyzers

Gold standard for versatile long-read system

- Longest read lengths of any CE system
- Higher optical sensitivity and advanced polymers for higher-quality data at a lower cost per sample
- Continuous 48-hour, hands-free automation
- Multiple automation features improve productivity while reducing costly human errors
- Perform resequencing, microsatellite analysis, AFLP®, LOH, SNP screening, and validation

The 3730 and 3730xl DNA Analyzers offer advances in automation and optics along with proprietary Applied Biosystems® reagents and software to support a diverse range of genetic analysis projects. Assay designs combined with unique software features and optional instrument upgrades make it possible for you to get truly meaningful results both quickly and easily.

3730 DNA Analyzer.

3730xl DNA Analyzer.

Product	Quantity	Cat. No.
3730 DNA Analyzer (48 capillaries)	1 instrument	3730S
3730xl DNA Analyzer (96 capillaries)	1 instrument	3730XL
3730 DNA Analyzer (factory-refurbished)	1 instrument	3730S-R
3730xl DNA Analyzer (factory-refurbished)	1 instrument	3730XL-R
Upgrade 3730 to 3730xl (36 cm array)	1 unit	4331831
Upgrade 3730 to 3730xl (50 cm array)	1 unit	4338069
TargetSeq™ Resequencing System	1 unit	4373905
3730/3730xl Data Collection Software Upgrade	1 unit	4364619

Table 9. 3730 and 3730xl DNA Analyzer sequencing performance specifications.

Run module	Array length (cm)	Polymer	Run time (min)	KB™ Basecaller QV20 LOR (bases)[1]	Runs/ day	3730xl		3730	
						Samples/ day	KB™ Basecaller QV20 bases/day	Samples/ day	KB™ Basecaller QV20 bases/day
XLRSeq50_POP7	50	POP-7™	180	900	8	768	691,200	384	345,600
LongSeq50_POP7	50	POP-7™	120	850	12	1,152	979,200	576	489,600
FastSeq50_POP7	50	POP-7™	60	700	24	2,304	1,612,800	1,152	806,400
StdSeq36_POP7	36	POP-7™	60	700	24	2,304	1,612,800	1,152	806,400
RapidSeq36_POP7	36	POP-7™	35	550	40	3,840	2,122,000	1,920	1,056,000
TargetSeq36_POP7	36	POP-7™	20	400[2]	72	6,912	2,880,000	3,456	1,440,000
StdSeq36_POP6	36	POP-6™	60	500	24	2,304	1,152,000	384	576,000
StdSeq50_POP6	50	POP-6™	150	600	9	864	518,400	144	259,200

1. Length of read with 98.5% basecalling accuracy, <2% N, using pGEM-32f(+) as template.
2. Throughput numbers shown are for 400 bp reads (long-read standards—HSP69 template); module can be customized to run 200–400 bases.

Table 10. 3730 and 3730xl DNA Analyzer fragment analysis performance specifications.

	Array length (cm)	Polymer	Run time (min)	24-hr throughtput		Resolution (bp)	Performance SD[2]
				3730 GT[1]	3730xL GT[1]		
GeneMapper36_POP7	36	POP-7™	32	41,280	82,560	450	0.15
GeneMapper50_POP7	50	POP-7™	43	30,720	61,440	500	0.15
GS1200LIZ_36_POP7	36	POP-7™	125	10,560	21,120	400	0.15
GS1200LIZ_50_POP7	50	POP-7™	135	9,600	19,200	700	0.15

1. 20 genotypes/injection.
2. Standard deviation: 1 base pair (bp) resolution at 99.99% accuracy.

Capillary Electrophoresis Instrument Accessories

Applied Biosystems® 310 Genetic Analyzer Accessories

Capillary Arrays

Product	Quantity	Cat. No.
310 Genetic Analysis Capillary, 47 cm	5	402839
310 Genetic Analysis Capillary, 61 cm	2	402840

Polymers

Product	Quantity	Cat. No.
POP-6™ Polymer for the 310 Genetic Analyzer	3 mL	402837
POP-4® Polymer for the 310 Genetic Analyzer	5 mL	402838

Buffers

Product	Quantity	Cat. No.
10X Genetic Analysis Buffer with EDTA	25 mL	402824

Accessories and Spare Parts

Product	Quantity	Cat. No.
310 Genetic Analyzer Buffer Vials, 4 mL	50	401955
1.0 mL Glass Syringe	1	4304471
Syringe Ferrule	1	5401
Gel Block Waste Vial	1	603796
Anode Buffer Reservoir Jar	1	5402
Valve, Waste Vial	1	604076
Valve, Plastic Syringe Luer	1	604075
Genetic Analyzer Capillary Cutters	2	401958
GeneScan™ Glass Syringe, 2.5 mL	1	604042
310 Platinum Cathode Electrode	1	5914
310 Capillary Fitting	1	5404
Air Filter, 10 x 20 x 7/8 inch	1	201356
Fitting, 1/4-28 TFE Syringe Plug 310	1	110319
Capillary Plug Fitting	1	7023
Syringe O-Ring	1	221102
O-Ring, 5/8 inch ID, Silicone	1	221085
O-Ring, 7/8 inch ID, Silicone	1	221101
O-Ring, 5/64 inch ID, Silicone	1	221100

Applied Biosystems® 310 Genetic Analyzer Accessories, *continued*

Tubes, Plates, Trays, and Covers

Product	Quantity	Cat. No.
96-Well Tray Adapter	1	4305051
96-Well Fast Plate Adapter	1	4370141
MicroAmp® 8-Tube Strips (0.2 mL)	125	N8010580
MicroAmp® 96-Well Base	10	N8010531
MicroAmp® Fast 96-Well Reaction Plates	10	4346907
MicroAmp® Sample Tubes (0.2 mL)	2,000	N8010533
MicroAmp® Tray and Retainer	10	403081
Retainer Clips (for 96-tube sample tray)	4	402866
Sample Tray (holds 48 x 0.5 mL sample tubes)	1	5572
Sample Tray Kit (48 x 0.5 mL tubes)	1	402867
Sample Tray Kit (96 x 0.2 mL tubes)	1	402868
Sample Tubes (0.5 mL)	500	401957
Septa (0.5 mL tube)	500	401956
Septa (0.2 mL tube)	480	4305547
Thermal Tape (0.5 inch, yellow)	1	310021

Documentation

Product	Quantity	Cat. No.
310 User Manual	1	903565
310 GeneScan™ Reference Guide	1	4303189

Computers and Basic Software

Product	Quantity	Cat. No.
310 Dell® Computer and Monitor with Microsoft® Windows® Operating System	1	4327282
310 Microsoft® Windows® XP Upgrade Kit	1	4327421
310 Microsoft® Windows® XP and Data Collection Software Upgrade Kit	1	4362970
310 G5v2 Module CD	1	4339037

Applied Biosystems® 3100 and 3100-*Avant*™ Genetic Analyzer Accessories

Capillary Arrays

Product	Quantity	Cat. No.
22 cm 3100 Capillary Array	1	4319898
36 cm 3100 Capillary Array	1	4315931
50 cm 3100 Capillary Array	1	4315930
80 cm 3100 Capillary Array	1	4319899
22 cm 3100-*Avant*™ Capillary Array	1	4333463
36 cm 3100-*Avant*™ Capillary Array	1	4333464
50 cm 3100-*Avant*™ Capillary Array	1	4333466
80 cm 3100-*Avant*™ Capillary Array	1	4333465

Polymers

Product	Quantity	Cat. No.
3100 POP-6™ Performance Optimized Polymer	7 mL	4316357
3100 POP-4® Performance Optimized Polymer	7 mL	4316355

Buffers

Product	Quantity	Cat. No.
10X Genetic Analysis Buffer with EDTA	25 mL	402824

Accessories and Spare Parts

Product	Quantity	Cat. No.
250 µL Glass Syringe	1	4304470
Buffer, Water, Waste Reservoir	1	628-0163
Array Calibration Ruler	1	628-3214
5.0 mL Glass Syringe	1	628-3731
Polymer Block Tubing Assembly	1	628-3732

Applied Biosystems® 3100 and 3100-*Avant*™ Genetic Analyzer Accessories, *continued*

96-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
96-Well Autosampler Plate Kit	1	4316471
MicroAmp® Optical 96-Well Reaction Plates	10	N8010560
MicroAmp® Optical 96-Well Reaction Plates	500	4316813
MicroAmp® Optical 96-Well Reaction Plates with Barcode	20	4306737
MicroAmp® Optical 96-Well Reaction Plates with Barcode	500	4326659
MicroAmp® Optical 96-Well Reaction Plates with Barcode and Optical Caps	20	403012
MicroAmp® Optical 96-Well Reaction Plates with Barcode and Optical Adhesive Films with Covers	100	4314320
96-Well Plate Bases	4	4317237
96-Well Plate Retainers	4	4317241
96-Well Plate Retainer (Septa Seal)	4	4334869
96-Well Plate Base (Septa Seal)	4	4334873
96-Well Plate Base (Heat Seal)	4	4334875
96-Well and 384-Well Plate Retainer (Heat Seal)	4	4334865
96-Well Plate Septa	20	4315933
Reservoir Septa	20	4315932

Fast 96 Plates, Trays, and Covers

Product	Quantity	Cat. No.
MicroAmp® Fast 96-Well Autosampler Plate Kit	1	4367468
MicroAmp® Fast 96-Well Reaction Plates	10	4346907
MicroAmp® Fast Optical 96-Well Reaction Plates with Barcode	20	4346906
MicroAmp® Fast Optical 96-Well Reaction Plates with Barcode	200	4366932
MicroAmp® Fast 96-Well Plate Bases	4	4367470
MicroAmp® Fast 96-Well Plate Retainers	4	4367471

Applied Biosystems® 3100 and 3100-*Avant*™ Genetic Analyzer Accessories, *continued*

384-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
384-Well Autosampler Plate Kit	1	4316472
MicroAmp® Optical 384-Well Reaction Plates with Barcode	50	4309849
MicroAmp® Optical 384-Well Reaction Plates with Barcode	500	4326270
MicroAmp® Optical 384-Well Reaction Plates	1,000	4343370
MicroAmp® Optical 384-Well Reaction Plates with Barcode	1,000	4343814
384-Well Plate Bases	4	4317236
384-Well Plate Retainers	4	4317240
384-Well Plate Base (Septa Seal)	4	4334874
384-Well Plate Retainer (Septa Seal)	4	4334868
384-Well Plate Base (Heat Seal)	4	4334877
96-Well and 384-Well Plate Retainer (Heat Seal)	4	4334865
384-Well Plate (Septa)	20	4315934

Documentation

Product	Quantity	Cat. No.
3100-*Avant*™ User Guide	1	4333549
3100-*Avant*™ User Reference Guide	1	4335393
Data Collection Software v2.0 User Guide	1	4347102
Chemistry Guide for Sequencing	1	4315831

Applied Biosystems® 3130 and 3130xl Genetic Analyzer Accessories

Capillary Arrays

Product	Quantity	Cat. No.
22 cm 3130 Capillary Array	1	4333463
36 cm 3130 Capillary Array	1	4333464
50 cm 3130 Capillary Array	1	4333466
80 cm 3130 Capillary Array	1	4333465
22 cm 3130xl Capillary Array	1	4319898
36 cm 3130xl Capillary Array	1	4315931
50 cm 3130xl Capillary Array	1	4315930
80 cm 3130xl Capillary Array	1	4319899

Polymers

Product	Quantity	Cat. No.
3130 POP-7™ Performance Optimized Polymer	7.0 mL	4352759
3130 POP-6™ Performance Optimized Polymer	7.0 mL	4352757
3130 POP-4® Performance Optimized Polymer	7.0 mL	4352755
3130 POP-7™ Performance Optimized Polymer	3.5 mL	4363785
3130 POP-6™ Performance Optimized Polymer	3.5 mL	4363783
3130 POP-4® Performance Optimized Polymer	3.5 mL	4363752

Buffers

Product	Quantity	Cat. No.
10X Genetic Analysis Buffer with EDTA	25 mL	402824

96-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
96-Well Plate Bases	4	4317237
96-Well Plate Retainers	4	4317241
96-Well Plate Septa	20	4315933

Fast 96 Plates, Trays, and Covers

Product	Quantity	Cat. No.
MicroAmp® Fast 96-Well Autosampler Plate Kit	1	4367468
MicroAmp® Fast 96-Well Reaction Plates	10	4346907
MicroAmp® Fast Optical 96-Well Reaction Plates with Barcode	20	4346906
MicroAmp® Fast 96-Well Plate Bases	4	4367470
MicroAmp® Fast 96-Well Plate Retainers	4	4367471

Applied Biosystems® 3130 and 3130xl Genetic Analyzer Accessories, *continued*

384-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
MicroAmp® Optical 384-Well Reaction Plates with Barcode	50	4309849
MicroAmp® Optical 384-Well Reaction Plates with Barcode	500	4326270
MicroAmp® Optical 384-Well Reaction Plates	1,000	4343370
MicroAmp® Optical 384-Well Reaction Plates with Barcode	1,000	4343814
384-Well Plate Bases	4	4317236
384-Well Plate Retainers	4	4317240
384-Well Plate (Septa)	20	4315934

Documentation

Product	Quantity	Cat. No.
Applied Biosystems® 3130 Series Training DVD	1	4370107

Applied Biosystems® 3500 and 3500xL Genetic Analyzer Accessories

Capillary Arrays

Product	Quantity	Cat. No.
3500 Capillary Array 24-Cap x 36 cm	1	4404687
3500 Capillary Array 24-Cap x 50 cm	1	4404689
3500 Capillary Array 8-Cap x 36 cm	1	4404683
3500 Capillary Array 8-Cap x 50 cm	1	4404685

Polymers

Product	Quantity	Cat. No.
POP-4® Polymer for 3500 Series Genetic Analyzers	384 samples	4393715
POP-4® Polymer for 3500 Series Genetic Analyzers	960 samples	4393710
POP-6™ Polymer for 3500 Series Genetic Analyzers	384 samples	4393717
POP-6™ Polymer for 3500 Series Genetic Analyzers	960 samples	4393712
POP-7™ Polymer for 3500 Series Genetic Analyzers	384 samples	4393708
POP-7™ Polymer for 3500 Series Genetic Analyzers	960 samples	4393714

Buffers

Product	Quantity	Cat. No.
Anode Buffer Container 3500 Series	4 pack	4393927
Cathode Buffer Container 3500 Series	4 pack	4408256

Conditioning

Product	Quantity	Cat. No.
Conditioning Reagent 3500 Series	1	4393718

Base, Retainer, and Septa

Product	Quantity	Cat. No.
384-Well Retainer and Base (Std)	1	4410235
8-Tube Retainer and Base (Fast)	4 pack	4410233
8-Tube Retainer and Base (Std)	4 pack	4410231
96-Well Retainer and Base (Fast)	4 pack	4409530
96-Well Retainer and Base (Std)	4 pack	4410228
Septa, 384-Well 3500 Series	20 sets	4412520
Septa, 8-Strip 3500 Series	24 sets	4410701
Septa, 96-Well 3500 Series	20 sets	4412614
Septa Cathode Buffer Container, 3500 Series	10 sets	4410715
Pouch Cap	4 pack	4412619

Applied Biosystems® 3730 and 3730xl DNA Analyzer Accessories

Capillary Arrays

Product	Quantity	Cat. No.
3730 Capillary Array, 48-Cap x 36 cm	1	4331247
3730 Capillary Array, 48-Cap x 50 cm	1	4331250
3730xl Capillary Array, 96-Cap x 36 cm	1	4331244
3730xl Capillary Array, 96-Cap x 50 cm	1	4331246

Polymers

Product	Quantity	Cat. No.
POP-7™ Polymer for 3730/3730xl	28 mL	4363929
POP-7™ Polymer for 3730/3730xl	10 x 28 mL	4363935
POP-7™ Polymer for 3730/3730xl	30 x 28 mL	4335611
POP-7™ Polymer for 3730/3730xl	5 x 28 mL	4335615

Buffers and Waste Containers

Product	Quantity	Cat. No.
10X Genetic Analysis Buffer with EDTA	500 mL	4335613
Anode Buffer Jar, v1.0	1 each	625-1973
Buffer, Water, and Waste Retainer	3 units	625-0500
Reservoir, Buffer and Water Waste	3 units	625-0501
Buffer, Water, and Waste Labels	4 sheets	625-1195
Drip Tray	1 each	625-1088
Water and Waste Plate Base	4 units	625-0502
Anode Buffer Jar, v2.0, 67 mL	1 each	625-2045
Reservoir Cap	3 units	625-0503

Applied Biosystems® 3730 and 3730xl DNA Analyzer Accessories, *continued*

Accessories and Spare Parts

Product	Quantity	Cat. No.
Heat-Seal Film Roll, seals 3,500 plates	1 roll	4337570
3730 Series Lower Polymer Block v2.0	1	625-2040
3730 Series Syringe with Fitting, 500 µL	1	625-1975
Cathode Buffer Plate Base	1 unit	625-0504
Array Ferrule Knob	1 each	628-3730
Array Ferrule Sleeves, PEEK	4 pack	628-0165
Polymer Block Interconnect Tubing, PEEK, v1.0	1 each	625-1980
Polymer Bottle Cap and Line, Radel, v2.0	2 caps	625-2047
Syringe Adaptor, 3100/3730	1 adapter	4322928
PDP/Lower Block Interconnect Line, Radel, v2.0	2 lines	625-2043
Sequencing and Genotyping Analysis Software Module for 3730/3730xl DNA Analyzers	1 each	4339241
Polymer Bottle Cap with Radel Tubing, v1.0	1 unit	4337418

96-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
MicroAmp® Optical 96-Well Reaction Plates	10	N8010560
MicroAmp® Optical 96-Well Reaction Plates	500	4316813
MicroAmp® Optical 96-Well Reaction Plates with Barcode	20	4306737
MicroAmp® Optical 96-Well Reaction Plates with Barcode	500	4326659
MicroAmp® Optical 96-Well Reaction Plates with Barcode and Optical Caps	20	403012
MicroAmp® Optical 96-Well Reaction Plates with Barcode and Optical Adhesive Films with Covers	100	4314320
96-Well Plate Retainer (Septa Seal)	4	4334869
96-Well Plate Base (Septa Seal)	4	4334873
96-Well Plate Base (Heat Seal)	4	4334875
96-Well and 384-Well Plate Retainer (Heat Seal)	4	4334865
96-Well Plate Septa	20	4315933
Reservoir Septa	20	4315932

Applied Biosystems® 3730 and 3730xl DNA Analyzer Accessories, *continued*

Fast 96 Plates, Trays, and Covers

Product	Quantity	Cat. No.
MicroAmp® Fast 96-Well Reaction Plates	10	4346907
MicroAmp® Fast Optical 96-Well Reaction Plates with Barcode	20	4346906
MicroAmp® Fast Optical 96-Well Reaction Plates with Barcode	200	4366932
MicroAmp® Fast 96-Well Plate Bases (Septa)	4	4367469
MicroAmp® Fast 96-Well Plate Retainers (Septa)	4	4367472
Fast 96-Well Plate Base (Heat Seal) for 3730 Systems (0.1 mL)	4	4367473
Fast 96-Well Plate Retainer (Heat Seal) for 3730 Systems (0.1 mL)	4	4367474

384-Well Plates, Trays, and Covers

Product	Quantity	Cat. No.
384-Well Autosampler Plate Kit	1	4316472
MicroAmp® Optical 384-Well Reaction Plates with Barcode	50	4309849
MicroAmp® Optical 384-Well Reaction Plates with Barcode	500	4326270
MicroAmp® Optical 384-Well Reaction Plates	1,000	4343370
MicroAmp® Optical 384-Well Reaction Plates with Barcode	1,000	4343814
384-Well Plate Base (Septa Seal)	4	4334874
384-Well Plate Retainer (Septa Seal)	4	4334868
384-Well Plate Base (Heat Seal)	4	4334877
96-Well and 384-Well Plate Retainer (Heat Seal)	4	4334865
384-Well Plate (Septa)	20	4315934

Documentation

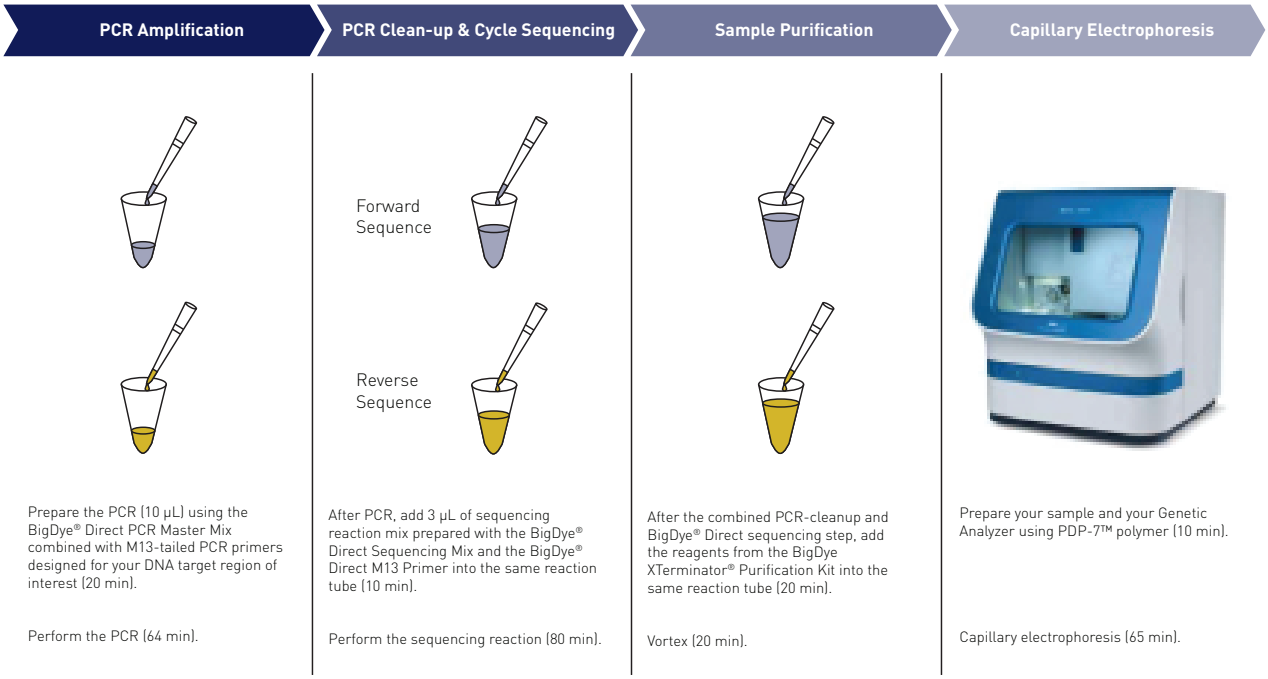
Product	Quantity	Cat. No.
3730 Series Chemistry Guide	1	4331467
3730 Series User Guide v2.0	1	4347118

DNA Sequencing Kits and Reagents

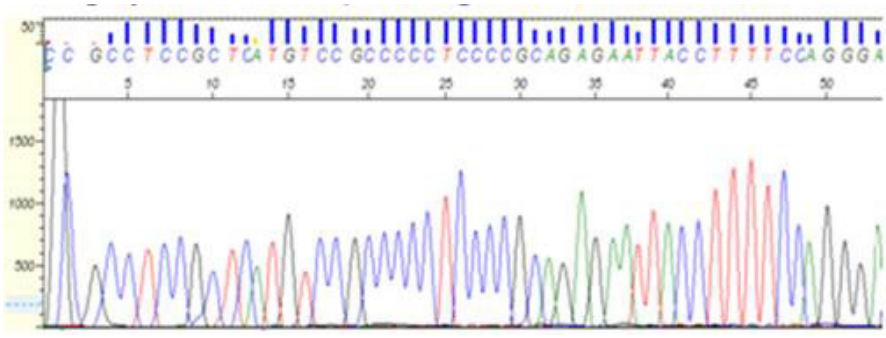
BigDye® Direct Cycle Sequencing Kit

The BigDye® Direct Cycle Sequencing Kit, the newest addition to the BigDye® product family, is a complete kit for your PCR and sequencing needs. This innovative, time-saving kit combines the PCR purification and cycle sequencing steps, enabling a streamlined protocol and shorter time to results.

- Streamlined, simple procedure
- All sequencing steps performed in a single reaction tube
- Fast migration with excellent resolution starting at the first base after the gene-specific primer sequence
- Substantial time savings versus previous workflows



BigDye® Direct sequencing workflow (time includes hands-on time).



Example of results obtained with BigDye® Direct Cycle Sequencing Kit and POP-7™ Polymer.

Product	Quantity	Cat. No.
BigDye® Direct Cycle Sequencing Kit	24 rxns	4458689
BigDye® Direct Cycle Sequencing Kit	100 rxns	4458687
BigDye® Direct Cycle Sequencing Kit	1,000 rxns	4458688

BigDye® Terminator v3.1 Cycle Sequencing Kit

- Long, high-quality reads
- More accurate base assignments for heterozygote and mutation detection

The BigDye® Terminator v3.1 Cycle Sequencing Kit's robust, highly flexible chemistry is ideal for *de novo* sequencing, resequencing, and finishing with PCR product, plasmid, fosmid, and BAC templates.

BigDye® Terminator v3.1 Cycle Sequencing Kit.

- Helps to improve the quality of your results in a wide range of sequencing applications
- Optimized for long read lengths
- Better dye mobility characteristics
- Improved performance reading through GT-rich regions
- Get longer, higher-quality reads with more uniform peak heights and optimal signal balance
- Designed to enhance your productivity and reduce costs

Product	Quantity	Cat. No.
BigDye® Terminator v3.1 Cycle Sequencing Kit	24 rxns	4337454
BigDye® Terminator v3.1 Cycle Sequencing Kit	100 rxns	4337455
BigDye® Terminator v3.1 Cycle Sequencing Kit	1,000 rxns	4337456
BigDye® Terminator v3.1 Cycle Sequencing Kit	5,000 rxns	4337457
BigDye® Terminator v3.1 Cycle Sequencing Kit	25,000 rxns	4337458

BigDye® Terminator v1.1 Cycle Sequencing Kit

The BigDye® Terminator v1.1 Cycle Sequencing Kit is designed for specialty applications that require optimal basecalling adjacent to the primer and for sequencing short PCR product templates with rapid electrophoresis run modules.

- Helps to improve the quality of your results for a wide range of sequencing applications
- Sequence challenging templates and sequences more successfully
- Get longer, higher-quality reads with more uniform peak heights and optimal signal balance
- Designed to enhance your productivity and reduce costs

Product	Quantity	Cat. No.
BigDye® Terminator v1.1 Cycle Sequencing Kit	24 rxns	4337449
BigDye® Terminator v1.1 Cycle Sequencing Kit	100 rxns	4337450
BigDye® Terminator v1.1 Cycle Sequencing Kit	1,000 rxns	4337451
BigDye® Terminator v1.1 Cycle Sequencing Kit	5,000 rxns	4337452

BigDye® Terminator Sequencing Buffer

The 5X Sequencing Buffer is optimized for use with BigDye® Terminator Cycle Sequencing Kits.

Product	Quantity	Cat. No.
BigDye® Terminator v1.1/v3.1 5X Sequencing Buffer	1 mL	4336697
BigDye® Terminator v1.1/v3.1 5X Sequencing Buffer	28 mL	4336699
BigDye® Terminator v1.1/v3.1 5X Sequencing Buffer	233 mL	4336701

BigDye XTerminator® Purification Kit

- Complete dye blob removal
- Fast and simple workflow
- Stabilizes samples before analysis
- No sample transfer required
- Rapid, reliable, and reproducible results

The BigDye XTerminator® Purification Kit is a fast, simple purification method for DNA sequencing reactions that removes unincorporated BigDye® terminators and salts. No more dye blobs! Clean-up is complete in under 40 minutes and typically requires less than 10 minutes of labor. The BigDye XTerminator® Kit yields high-quality data with long reads, strong signal, and superior short fragment recovery. The kit also removes dye blobs from unincorporated dye terminators and salts.

Simple Purification Process

Traditional purification methods, such as ethanol precipitation, require the addition of multiple reagents along with decanting and centrifuging steps. The BigDye XTerminator® Purification Kit requires the addition of only two reagents, which can be added sequentially or premixed:

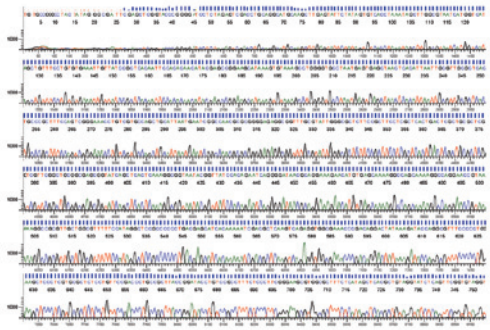
- XTerminator® Solution—scavenges unincorporated dye terminators and free salts from the post-sequencing reaction
- SAM™ Solution—enhances the performance of the XTerminator® Solution and stabilizes the post-purification reactions

Increased Stability

Sealed reaction plates are stable for 48 hours at room temperature or 10 days at 4°C, giving you the flexibility to re-run samples as needed without having to repeat the entire experiment.

Run Modules Available

Life Technologies provides downloadable run modules for the BigDye XTerminator® Purification Kit and Data Collection Software. These modules are designed for the 3100/3100-*Avant*™, 3130/3130xl, 3500/3500xL, and 3730/3730xl analyzers. The software modules for the BigDye XTerminator® Purification Kit are compatible with Windows® 2000 and Windows® XP operating systems and are available on our software download page at https://www2.appliedbiosystems.com/support/software.



Long-read sequence data using the BigDye XTerminator® Purification Kit. High-quality, dye blob–free data can be produced without sacrificing sequence length of read. Q20 base read = 1,044 bp. Data kindly provided by the DNA Technology Unit, Plant Biotechnology Institute (NRC-PBI), Saskatoon, Canada.

Product	Quantity	Cat. No.
BigDye XTerminator® Purification Kit, 2 mL	~100 x 20 µL rxns	4376486
BigDye XTerminator® Purification Kit, 20 mL	~1,000 x 20 µL rxns	4376487
BigDye XTerminator® Purification Kit, 50 mL	~2,500 x 20 µL rxns	4376484
BigDye XTerminator® Purification Kit, 800 mL	~40,000 x 20 µL rxns	4376485

dGTP BigDye® Terminator Cycle Sequencing Kits

The dGTP BigDye® Terminator Cycle Sequencing Kits replace dITP with dGTP to sequence GT- and G-rich templates. The kits require no new software or instrument recalibration, so you can easily integrate them into your current workflow with minimal protocol changes. Version 1.0 uses the same dye set as the BigDye® Terminator v1.1 Cycle Sequencing Kit, whereas version 3.0 uses the same dye set as the BigDye® Terminator v3.1 Cycle Sequencing Kit.

Product	Quantity	Cat. No.
dGTP BigDye® Terminator v1.0 Cycle Sequencing Ready Reaction Kit	100 rxns	4307175
dGTP BigDye® Terminator v3.0 Cycle Sequencing Ready Reaction Kit	100 rxns	4390229

dRhodamine Terminator Cycle Sequencing Kit

The dRhodamine Terminator Cycle Sequencing Kit combines proprietary dye terminators with the preferred enzyme for fluorescent sequencing, AmpliTaq® DNA Polymerase, FS. Dichlororhodamine (dRhodamine) terminators provide more even peak patterns and less background noise than conventional rhodamine terminators. The result is higher accuracy, longer read lengths, and greater productivity in automated sequencing.

Product	Quantity	Cat. No.
dRhodamine Dye Terminator Cycle Sequencing Kit	100 rxns	403044
dRhodamine Dye Terminator Cycle Sequencing Kit	1,000 rxns	403045
dRhodamine Dye Terminator Cycle Sequencing Kit	5,000 rxns	4303143
dRhodamine Dye Terminator 5X Sequencing Buffer	1.2 mL	4305605
dRhodamine Dye Terminator 5X Sequencing Buffer	10.8 mL	4305603

BigDye® Primer Cycle Sequencing Kits

- Higher sensitivity decreases sample-size requirements
- Minimal mobility shift improves peak resolution and basecalling accuracy
- No ethanol precipitation required

BigDye® Primer Cycle Sequencing Kits provide optimized fluorescent primers for decreased background noise in a wide array of sequencing applications.

Product	Quantity	Cat. No.
BigDye® Primer Cycle Sequencing Kit, forward	100 rxns	403051
BigDye® Primer Cycle Sequencing Kit, reverse	100 rxns	403052

SeCore® HLA Sequencing Kits

- BigDye® chemistry for longer and higher-quality reads, accurate results and base assignments (particularly in heterozygote detection)
- Strong signal, excellent peak uniformity, and low background
- Optimized primer cocktails for superior allele balance
- Improved laboratory efficiency—one protocol for all loci
- Streamlined sequencing workflow for reduced sample handling errors and improved technician efficiency
- High resolution through GSSP kits that are current and comprehensive

SeCore® kits include uTYPE® HLA analysis software. uTYPE® software incorporates sophisticated algorithms that translate the sequencing data into an intuitively guided analysis for HLA typing.

SeCore® HLA Sequencing Kits.

Sequencing kit*	Exon targets
Class I	
SeCore® Locus A	Bidirectional sequencing of exons 2, 3, and 4 (amplicon includes exons 1–5)
SeCore® Locus B	Bidirectional sequencing of exons 2, 3, and 4
SeCore® Locus C	Bidirectional sequencing of exons 2, 3, and 4 (amplicon includes exons 1–6)
Class II	
SeCore® Locus DRB1	Bidirectional sequencing of exon 2 and codon 86
SeCore® Locus DRB GRP	Bidirectional sequencing of exon 2 and codon 86
SeCore® Locus DQB1	Bidirectional sequencing of exons 2 and 3
SeCore® Locus DPB1	Bidirectional sequencing of exons 2, 3, and 4; and codons 8 and 85

*Each SeCore® kit includes amplification mix, FastStart® *Taq* polymerase, purification cocktail, sequencing mixes (including BigDye® 1.1 Terminators), and precipitation buffer.

Product	Quantity	Cat. No.
SeCore® Locus A, single amplification system	25 tests	5300925
SeCore® Locus B, single amplification system	25 tests	5310925
SeCore® Locus C, single amplification system	25 tests	5320925
SeCore® Locus DRB1, single amplification system	25 tests	5330925
SeCore® Locus DRB, group-specific set	25 tests	5331925
SeCore® Locus DQB1, two-amplification system	25 tests	5341925D
SeCore® Locus DPB1, two-amplification system	25 tests	5351925
SeCore® Locus A, single amplification system	500 tests	22009D
SeCore® Locus B, single amplification system	500 tests	22119D
SeCore® Locus C, single amplification system	500 tests	22209D
SeCore® Locus DRB1, single amplification system	500 tests	22309D
SeCore® Locus DQB1, two-amplification system	500 tests	22419D
SeCore® Locus DPB1, two-amplification system	500 tests	22519D
SeCore® Custom GSSP Kit	25 rxns	A11255
uTYPE® Dx Allele Library Updates	1 each	53999100
uTYPE® Dx Sequencing Analysis Software	1 each	539991

These catalog kit numbers are customer country–specific. Please consult your Life Technologies sales representative for assistance.

Sequencing Standards and Sequencing Matrix Standards for Applied Biosystems® Genetic Analyzers

Matrix and sequencing standards are used to calibrate the instrument. The standards depend on the type of instrument and chemistry used.

Table 11. Matrix and sequencing standards by instrument and chemistry.

	dRhodamine		BigDye® Terminator v1.1		BigDye® Terminator v3.1 and BigDye® Direct	
Instrument	**Matrix**	**Sequencing standard**	**Matrix**	**Sequencing standard**	**Matrix**	**Sequencing standard**
310	403046	4303120	4336805	4336791	4336948	4336935
3100/3100-*Avant*™	NA	4303120	4336824	4336791	4336974	4336935
3130/3130xl	NA	4303120	4336824	4336791	4336974	4336935
3500/3500xL	NA	4303120	4336824	4404314	4336974	4404312
3730/3730xl	NA	4303120	NA	4336799	NA	4336943

Sequencing Standards

Product	Quantity	Cat. No.
310/3100/3100-*Avant*™ Genetic Analyzer Sequencing Standards, BigDye® Terminator v1.1*	4 tubes	4336791
310/3100-*Avant*™/3130/3130xl Genetic Analyzer Sequencing Standards, BigDye® Terminator v3.1	4 tubes	4336935
3730/3730xl DNA Analyzer Sequencing Standards, BigDye® Terminator v1.1	4 tubes	4336799
3730/3730xl DNA Analyzer Sequencing Standards, BigDye® Terminator v3.1	4 tubes	4336943
Long-Read Sequencing Standards, dRhodamine Terminator Cycle	1 tube	4303120

*Also for use with the 3130/3130xl Genetic Analyzers.

Sequencing Matrix Standards

Product	Quantity	Cat. No.
310 Genetic Analyzer Matrix Standards, BigDye® Terminator v1.1	1	4336805
310 Genetic Analyzer Matrix Standards, BigDye® Terminator v3.1	1	4336948
310 Genetic Analyzer Matrix Standards Kit, dRhodamine	1	403046
310 Genetic Analyzer Matrix Standards Kit with Manual and Software, dRhodamine	1	403047
31xx and 3500 Matrix Standards Kit, BigDye® Terminator v1.1	1	4336824
31xx Matrix Standards Kit, BigDye® Terminator v3.1	1	4336974

Sequencing Install Standards for Applied Biosystems® Genetic Analyzers

For the Applied Biosystems® 3500 Series Genetic Analyzer

Product	Quantity	Cat. No.
Seq Install Standard v3.1, 3500 Series	4 tubes	4404312
Seq Install Standard v1.1, 3500 Series	4 tubes	4404314

Hi-Di™ Formamide

Highly deionized formamide used for electrokinetic injection on capillary electrophoresis systems. Sample resuspension solution for use with sequencing and fragment analysis applications.

Product	Quantity	Cat. No.
Hi-Di™ Formamide	25 mL	4311320
Hi-Di™ Formamide, 5 mL	4 tubes	4440753

Spin Columns, 96-Well Plates, and 8-Well Strips

- Process faster than ultrafiltration columns
- Rapid and efficient separations
- Buffer is not preselected
- Convenient 20–100 µL sample size

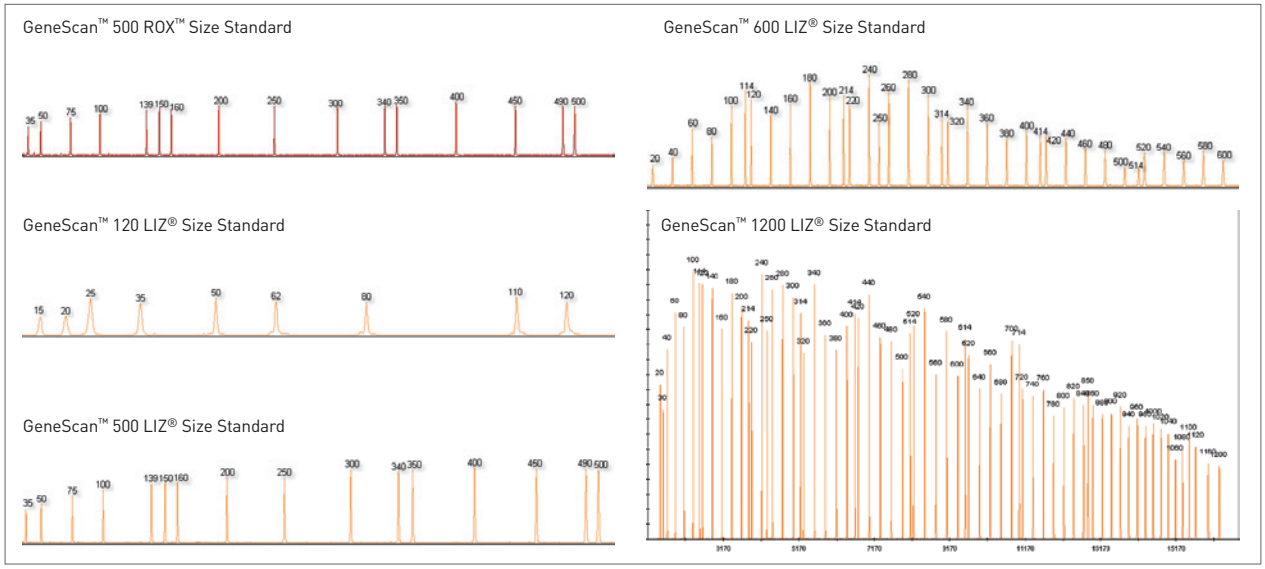
Centri-Sep™ Spin Columns are used for the fast and efficient purification of nucleic acids. Both dry and hydrated columns are available. The Centri-Sep™ dry gel can be stored at room temperature. It provides excellent recovery of DNA fragments larger than 16 base pairs and excludes greater than 98% of salts, NTPs, and other unwanted, low-molecular-weight impurities.

Product	Quantity	Cat. No.
Centri-Sep™ Columns	32	401763
Centri-Sep™ Columns	100	401762
Centri-Sep™ 96-Well Plates	2	4367819
Centri-Sep™ 96-Well Plates	50	4367821
Centri-Sep™ 8-Well Strips	12	4367820

Fragment Analysis Kits and Reagents

GeneScan™ Size Standards

GeneScan™ Size Standards are fluorescently labeled DNA fragments required for performing fragment analysis and genotyping applications on Applied Biosystems® capillary electrophoresis platforms. Each standard contains fragments of known sizes that will be used by the data analysis software to generate a calibration curve, which is then used to determine the size of unknown fragments in a sample. GeneScan™ Size Standards generate reliable and reproducible size calls, and are available with either ROX™ fluorophore or the proprietary fifth dye, the LIZ® dye. The LIZ® dye–labeled standards offer higher throughput and reduced project costs by enabling an increase in the number of markers that can be multiplexed in a single sample.



GeneScan™ Size Standards.

Product	Quantity	Cat. No.
GeneScan™ 120 LIZ® Size Standard	800 analyses	4324287
GeneScan™ 350 ROX™ Size Standard	800 analyses	401735
GeneScan™ 350 TAMRA™ Size Standard	800 analyses	401736
GeneScan™ 400HD ROX™ Size Standard	800 analyses	402985
GeneScan™ 400HD ROX™ Size Standard	9,600 analyses	4310366
GeneScan™ 500 LIZ® Size Standard	800 analyses	4322682
GeneScan™ 500 ROX™ Size Standard	800 analyses	401734
GeneScan™ 500 ROX™ Size Standard	9,600 analyses	9310361
GeneScan™ 500XL ROX™ Size Standard	1,600 analyses	403039
GeneScan™ 500XL TAMRA™ Size Standard	1,600 analyses	403040
GeneScan™ 500 TAMRA™ Size Standard	800 analyses	401733
GeneScan™ 600 LIZ® Size Standard	800 analyses	4366589
GeneScan™ 600 LIZ® Size Standard v2.0	800 analyses	4408399
GeneScan™ 1000 ROX™ Size Standard*	400 analyses	401098
GeneScan™ 1200 LIZ® Size Standard	800 analyses	4379950
GeneScan™ 2500 ROX™ Size Standard*	400 analyses	401100
GeneScan™ 2500 TAMRA™ Size Standard*	400 analyses	401545

* These size standards are for use in nondenaturing conditions.

Hi-Di™ Formamide

Highly deionized formamide used for electrokinetic injection on capillary electrophoresis systems. Sample resuspension solution for use with sequencing and fragment analysis applications.

Product	Quantity	Cat. No.
Hi-Di™ Formamide	25 mL	4311320
Hi-Di™ Formamide, 5 mL	4 tubes	4440753

Fragment Analysis Matrix Standards

Matrix standards are used to calibrate the instrument. The standards depend on the type of instrument and dye set used.

Table 12. Matrix standards by dye set and instrument.

Dye set	DS-02	DS-30	DS-31	DS-32	DS-33	DS-34
Filter set	E5	D	D*	F	G5	C
Blue dye	dR110	6-FAM™	6-FAM™	5-FAM™	6-FAM™	6-FAM™
Green dye	dR6G	HEX™	VIC®	JOE™	VIC®	TET™
Yellow dye	dTAMRA™	NED™	NED™	NED™	NED™	HEX™
Red dye	dROX™	ROX™	ROX™	ROX™	PET®	TAMRA™
Orange dye	LIZ®	NA	NA	NA	LIZ®	NA
Instrument						
310	4323050	401546, 402996	402996, 4313939	4312131	4318159	401546
3100/3100-*Avant*™	4323014	4345827	4345829	4345831	4345833	NA
3130/3130xl	4323014	4345827	4345829	4345831	4345833	NA
3500/3500xL	4323014	4345827	4345829	4345831	4345833	NA
3730/3730xl	4323014	4345827	4345829	4345831	4345833	NA

Fragment Analysis Matrix Standards for the 310 Genetic Analyzer

Product	Quantity	Cat. No.
DS-02 Matrix Standard Set (dR110, dR6G, dTAMRA™, dROX™, LIZ® dyes)	1	4323050
DS-32 Matrix Standard Set (5-FAM™, JOE™, NED™, ROX™ dyes)	1	4312131
DS-33 Matrix Standard Set (6-FAM™, VIC®, NED™, PET®, LIZ® dyes)	1	4318159
Fluorescent Amidite Matrix Standards (6-FAM™, TET, HEX, TAMRA™, ROX™ dyes)	1	401546
NED™ Matrix Standard	1	402996
VIC® Matrix Standard	1	4313939

DS-30 Matrix Standard Set (6-FAM™, HEX™, NED™, ROX™ dyes) can be made by combining Cat. Nos. 401546 and 402996.

DS-31 Matrix Standard Set (6-FAM™, VIC®, NED™, ROX™ dyes) can be made by combining Cat. Nos. 401546, 402996, and 4313939.

Fragment Analysis Matrix Standards for the 3500 Series Genetic Analyzer

Product	Quantity	Cat. No.
DS-33 GeneScan™ Installation Standards (with GeneScan™ 600 LIZ® Size Standard v2.0)	1	4376911

Fragment Analysis Matrix Standards for the 3130/3130xl Genetic Analyzers, 3500/3500xL Genetic Analyzers, and 3730/3730xl DNA Analyzers

Product	Quantity	Cat. No.
DS-01 Matrix Standard Set for the 3130xl Genetic Analyzer	8 analyses	4315974
DS-02 Matrix Standard Kit for Dye Set E5 (dR110, dR6G, dTAMRA™, dROX™, LIZ® dyes)	8 analyses	4323014
DS-30 Matrix Standard Kit for Dye Set D (6-FAM™, HEX™, NED™, ROX™ dyes)	8 analyses	4345827
DS-31 Matrix Standard Kit for Dye Set D (6-FAM™, VIC®, NED™, ROX™ dyes)	8 analyses	4345829
DS-32 Matrix Standard Kit for Dye Set F (5-FAM™, JOE™, NED™, ROX™ dyes)	8 analyses	4345831
DS-33 Matrix Standard Kit for Dye Set G5 (6-FAM™, VIC®, NED™, PET®, LIZ® dyes)	8 analyses	4345833

Fragment Analysis Installation Standards

For the 310, 3100, and 3100-*Avant*™ Genetic Analyzers, 3130 and 3130xl Genetic Analyzers, 3500 and 3500xL Genetic Analyzers, and 3730 and 3730xl DNA Analyzers

Product	Quantity	Cat. No.
GeneScan™ Installation Standard DS-33, 6-FAM™, VIC®, NED™, PET® for the 310, 3100, 3730, and 3730xl Systems (with GeneScan™ 500 LIZ® Size Standard)	1	4330397
GeneScan™ Installation Standard using 6-FAM™, VIC®, NED™, and PET® dyes (with GeneScan™ 600 LIZ® Size Standard) v2.0	1	4376911

Standards consist of pooled PCR products amplified from microsatellite loci present in CEPH individual 1347-02.

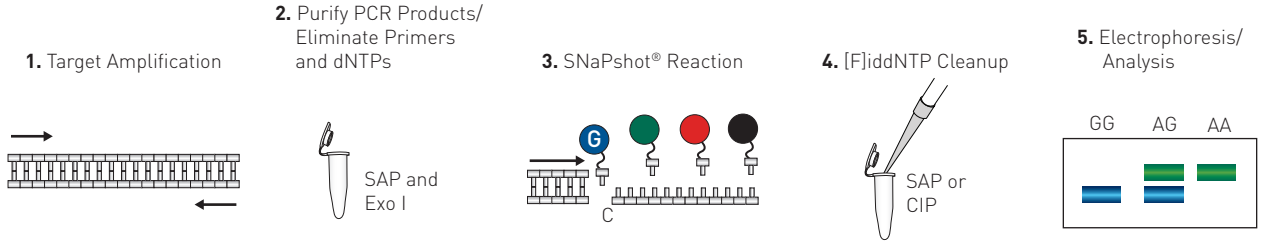
SNaPshot® Multiplex System

- Interrogate multiple SNPs regardless of chromosome position
- Separate SNP loci that differ by a single base pair
- Perform single sample genotyping without using cluster-based data analysis
- Conserve your amplified template without sacrificing robust interrogation
- Run on any Applied Biosystems® capillary electrophoresis instrument

The SNaPshot® Multiplex Kit is a primer extension–based method that enables multiplexing of up to 10 SNPs (single nucleotide polymorphisms). Use this system to screen and confirm SNPs, assess DNA methylation, and fingerprint BACs.

Screen and Confirm SNPs

The SNaPshot® Multiplex Kit is the perfect tool for SNP screening and validation. The kit offers a one-tube single-base extension/termination reagent to label DNA fragments. First, run DNA fragments on any Applied Biosystems® capillary electrophoresis instrument with the GeneScan™ 120 LIZ® Size Standard to indicate the size of labeled fragments. Then use GeneMapper® Software to analyze the data and generate allele calls. The SNaPshot® Multiplex Kit allows multiplexing during single-base extension of up to 10 primer-template combinations in a single-tube, single-capillary format.



SNaPshot® Multiplex Kit workflow.

Assess DNA Methylation

The study of methylation/epigenetics is emerging as an important component of cancer research. In a typical assay to detect methylation, bisulfite treatment of DNA deaminates unmethylated cytosine and converts it to uracil while methylated cytosine remains unchanged. The subsequent step of PCR amplification converts uracil bases to thymine. Use the SNaPshot® system to quantitatively detect the base differences in treated and untreated samples to learn the methylation status of your samples.

SNaPshot® Multiplex Kit results.

Fingerprint BACs

New BAC libraries require a rapid, efficient method for characterization (also called fingerprinting) and assembly of clones into contigs (contiguous consensus sequences), which are then arrayed into physical maps of the chromosome. Use the SNaPshot® Multiplex Kit to fingerprint clones by labeling BAC fragments after digestion with restriction endonucleases. The labeled fragments can then be separated and detected on any Applied Biosystems® capillary electrophoresis instrument. Sizing information from GeneMapper® Software v3.5 or higher is imported into subsequent editing and contig assembly programs. The high-quality results you get from the SNaPshot® Multiplex Kit provides an easy-to-use and cost-effective solution for high-throughput BAC fingerprinting.

Designing SNaPshot® Multiplex Assays

Use the SNaPshot® Primer Focus® Kit to analyze individual primers for their approximate sizing locations prior to performing the SNP genotyping multiplex reactions. This will determine whether or not two oligonucleotides will produce overlapping signals when run simultaneously, and will enable setting tight loci windows in GeneMapper® Software.

Product	Quantity	Cat. No.
SNaPshot® Primer Focus® Kit	100 rxns	4329538
SNaPshot® Multiplex Kit	100 rxns	4323159
SNaPshot® Multiplex Kit	1,000 rxns	4323161
SNaPshot® Multiplex Kit	5,000 rxns	4323163

AFLP® Kits

AFLP® Kits for plant and microbial genomes

Amplified fragment length polymorphism (AFLP®) analysis is a genetic mapping technique that uses selective amplification of a subset of restriction enzyme-digested DNA fragments to generate a unique fingerprint for a particular genome. The power of AFLP® analysis derives from its ability to quickly generate large numbers of marker fragments for any organism, without prior knowledge of the genomic sequence.

The Plant Mapping Kit contains reagents and primers to perform AFLP® analysis on plant genomes. The AFLP® Microbial Fingerprinting Kit contains reagents and primers to perform AFLP® analysis on microbial genomes. Whether you are embarking on a project to map a new genome or genotyping a previously studied organism, the kits offer a panel of primer pairs that have been tested across a variety of genomes.

The AFLP® assay consists of three steps: restriction ligation reaction, preselective amplification reaction, and a selective amplification step with fluorescently labeled primers. The products of the selective amplification reaction are mixed with a GeneScan™ size standard and run on an Applied Biosystems® genetic analyzer. To get started, you will need reagents for the (1) restriction ligation, (2) preselective amplification, and (3) selective amplification reactions.

Reagents for Ligation and Preselective Amplification for Plant Genomes

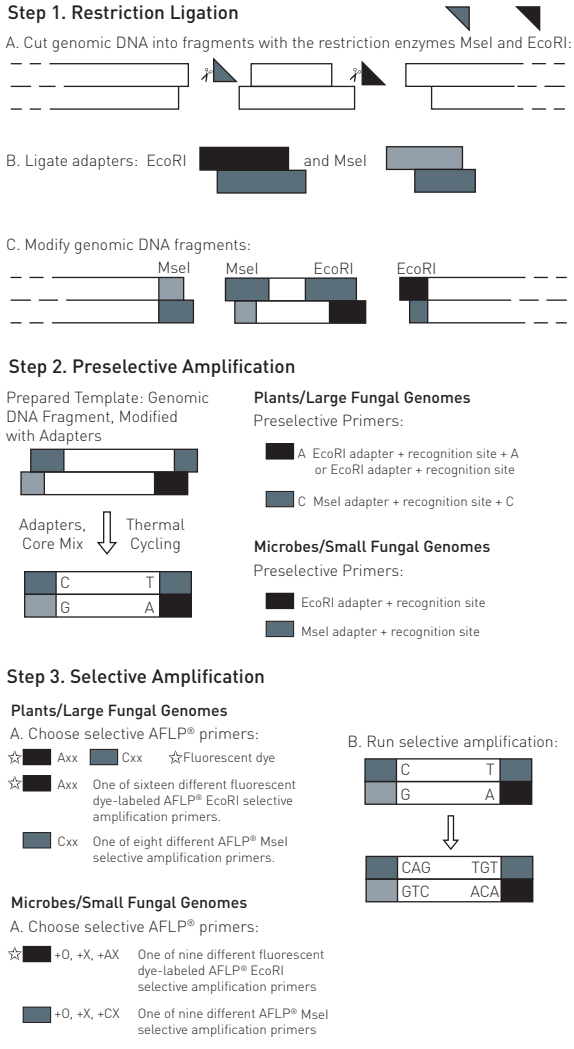
Use the regular genome or small genome kit depending on the size of the genome that you are studying.

Reagents for the Selective Amplification Step (Selective Primers)

After ligation and preselective amplification, the selective amplification step is performed using the appropriate primer pair(s). The Applied Biosystems® Plant Mapping Kit contains eight selective EcoRI primers for regular plant genomes, eight selective EcoRI primers for small plant genomes, and eight unlabeled MseI primers. The EcoRI primers are labeled with either 5-FAM™, NED™, or JOE™ fluorophores (dye set F). This kit allows researchers to choose from 128 possible primer combinations that have been tested across several crop genomes. This enables identification of optimal primers for a given organism without the need to design, synthesize, and perform quality control of primers. Primer pairs may be ordered in any combination of one EcoRI and one MseI primer.

Selective Amplification Startup Kits

The AFLP® Selective Amplification Startup Kit can be used to test all possible selective primer pairs on a given genome. The regular plant genome kit contains all eight EcoRI-selective primers for regular genomes plus MseI-selective primers, while the small plant genome kit contains all eight EcoRI-selective primers for small genomes plus MseI-selective primers. This kit supplies sufficient primer quantity to test all possible 64 primer combinations on 30 individuals. For each primer combination, you can compare the total number of peaks amplified in the parents, the number of polymorphic peaks between the parents, and the segregation ratios of polymorphic peaks in the progeny. Once you establish the most useful primer combination for your sample, you can purchase 250 or 500 reactions of primer along with the AFLP® Amplification Core Mix Kit, which contains the necessary reagents for performing PCR.



Overview of the AFLP® assay.

Kits for Small and Regular Plant Genomes

Product	Quantity	Cat. No.
Ligation and Preselective Amplification Kit for regular genomes, 500–6,000 Mb*	100 rxns	402004
Ligation and Preselective Amplification Kit for small genomes, 50–500 Mb*	100 rxns	402273
AFLP® EcoRI and MseI Adapters	100 rxns	403077
AFLP® I Preselect Primer Mix (preselective primer mix for regular genomes)	100 rxns	403078
AFLP® II Preselect Primer Mix (preselective primer mix for small genomes)	100 rxns	403079
Amplification Core Mix†	500 rxns	402005
AFLP® Corn Genomic DNA‡	2 rxns	402991

*The Ligation and Preselective Amplification Kit contains the AFLP® EcoRI Adapter Pair, MseI Adapter Pair, Amplification Core Mix, Corn Genomic Control DNA Amplification Core Mix, and EcoRI/MseI Preselective Amplification Primers.

† Contains the necessary reagents for performing PCR.

‡ Use as control DNA for Plant AFLP® assays.

Selective Amplification Startup Kits for Plant Genomes

Product	Quantity	Cat. No.
Selective Amplification Startup Kit for regular plant genomes	30 analyses with 64 primer pairs	4303050
Selective Amplification Startup Kit for small plant genomes	30 analyses with 64 primer pairs	4303051

Individual Selective Primers for Plant Genomes

EcoRI Primers, Small Plant Genomes

Product	Quantity	Cat. No.
EcoRI-TG FAM™	250 rxns	402264
EcoRI-TC FAM™	250 rxns	402265
EcoRI-AC FAM™	250 rxns	402269
EcoRI-TT NED™	250 rxns	4303052
EcoRI-AT NED™	500 rxns	402955
EcoRI-TA JOE™	250 rxns	402267
EcoRI-AG JOE™	250 rxns	402268
EcoRI-AA JOE™	250 rxns	402271

EcoRI Primers, Regular Plant Genomes

Product	Quantity	Cat. No.	Quantity	Cat. No.
EcoRI-ACT FAM™	250 rxns	402045	500 rxns	402037
EcoRI-ACA FAM™	250 rxns	402038	500 rxns	402030
EcoRI-AAC NED™	250 rxns	4303053	500 rxns	4303054
EcoRI-ACC NED™	250 rxns	4303055	500 rxns	4303056
EcoRI-AGC NED™	250 rxns	4303057	500 rxns	4303058
EcoRI-AAG JOE™	250 rxns	402042	500 rxns	402034
EcoRI-AGG JOE™	250 rxns	402043	500 rxns	402035
EcoRI-ACG JOE™	250 rxns	402044	500 rxns	402036

MseI Primers, Regular and Small Plant Genomes

Product	Quantity	Cat. No.	Quantity	Cat. No.
MseI-CAA	250 rxns	402021	500 rxns	402029
MseI-CAC	250 rxns	402020	500 rxns	402028
MseI-CAG	250 rxns	402019	500 rxns	402027
MseI-CAT	250 rxns	402018	500 rxns	402026
MseI-CTA	250 rxns	402017	500 rxns	402025
MseI-CTC	250 rxns	402016	500 rxns	402024
MseI-CTG	250 rxns	402015	500 rxns	402023
MseI-CTT	250 rxns	402014	500 rxns	402022

Reagents and Kits for Microbial Genomes

Microbial Genome Kits

Product	Quantity	Cat. No.
AFLP® EcoRI Ligation/Amplification Module*	1,000 rxns	402941
AFLP® MseI Ligation/Amplification Module†	1,000 rxns	402942

*Contains EcoRI adapter, EcoRI core sequence, 9 EcoRI Selective Primers (EcoRI-AC FAM™, EcoRI-T JOE™, EcoRI-C NED™, EcoRI-AA JOE™, EcoRI-A FAM™, EcoRI-G JOE™, EcoRI-AT NED™, EcoRI-0 FAM™ and EcoRI-AG JOE™), and reference DNA.

†Contains MseI adapter, MseI core sequence, 9 MseI Selective Primers (MseI-CG, MseI-CT, MseI-CA, MseI-T, MseI-0, MseI-CC, MseI-C, MseI-A, MseI-G), and reference DNA.

Microbial Genome Individual Reagents

Product	Quantity	Cat. No.
AFLP® *E. coli* W3110 DNA¥	25 rxns	402990
AFLP® Micro Adapter/Core Sequence‡	100 rxns	402943
Amplification Core Mix Module§	500 rxns	402005

¥Use as control DNA for Microbial AFLP® assays.

‡Contains adapters and primers for the restriction-ligation steps.

§Contains the necessary reagents for performing PCR.

Individual Selective Primers for Microbial Genomes

EcoRI Primers				
Product	Quantity	Cat. No.	Quantity	Cat. No.
EcoRI-0 FAM™	—	—	1,000 rxns	402949
EcoRI-A FAM™	—	—	1,000 rxns	402950
EcoRI-C NED™	—	—	1,000 rxns	402952
EcoRI-G JOE™	—	—	1,000 rxns	402953
EcoRI-T JOE™	—	—	1,000 rxns	402951
EcoRI-AA JOE™	250 rxns	402271	1,000 rxns	402954
EcoRI-AC FAM™	250 rxns	402269	1,000 rxns	402956
EcoRI-AG JOE™	250 rxns	402268	1,000 rxns	402957
EcoRI-AT NED™	500 rxns	402955	—	—
EcoRI-TC FAM	250 rxns	402265	—	—
EcoRI-TG FAM™	250 rxns	402264	—	—

MseI Primers				
Product	Quantity	Cat. No.	Quantity	Cat. No.
MseI-0	—	—	1,000 rxns	402958
MseI-A	—	—	1,000 rxns	402959
MseI-C	—	—	1,000 rxns	402961
MseI-G	—	—	1,000 rxns	402962
MseI-T	—	—	1,000 rxns	402960
MseI-CA	—	—	1,000 rxns	402963
MseI-CC	—	—	1,000 rxns	402965
MseI-CG	—	—	1,000 rxns	402966
MseI-CT	—	—	1,000 rxns	402964

References

1. Karudapuram S, Larson S (2005) Identification of Hedysarum varieties using Amplified Fragment Length Polymorphism on a Capillary Electrophoresis System. *J Biomol Tech* 16(4):318-326.

2. Amplified Fragment Length Polymorphism (AFLP®) on Applied Biosystems Capillary Electrophoresis Platforms. Applied Biosystems Application Note 106AP21-01.

Primers for Fragment Analysis

Custom Primers

- Get more genotyping information from every DNA sample, increase throughput, and reduce time-to-results with our 5-dye chemistry
- Maximize value by purchasing the quantity of material you need
- Choose from a range of dyes—6-FAM™, TET™, VIC®, HEX™, NED™, PET®

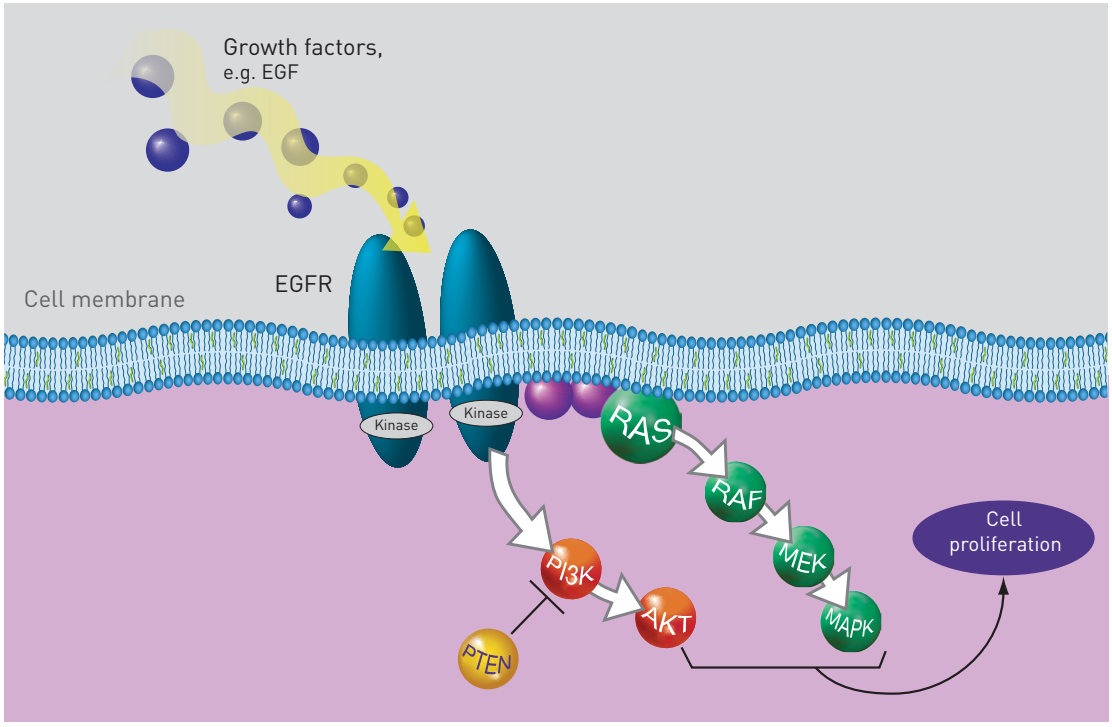
Our portfolio of custom, dye-labeled oligonucleotides and primer pairs is ideal for microsatellite and SNP genotyping, PCR, and fragment analysis. You provide the exact sequence of a fluorescently labeled probe or primer, and Life Technologies does the rest.

Product	Quantity	Cat. No.
5´ Fluorescent Labeled Oligonucleotide	10,000 pmol	450007
5´ Fluorescent Labeled Oligonucleotide	80,000 pmol	450006
5´ Fluorescent Labeled Oligonucleotide	300,000 pmol	450017
Primer Pair	2 tubes, 10,000 pmol	450056
Primer Pair	2 tubes, 80,000 pmol	450059
Primer Pair	2 tubes, 300,000 pmol	450062
Di-repeat Primer Pair	2 tubes, 10,000 pmol	4304976
Di-repeat Primer Pair	2 tubes, 80,000 pmol	4304977
Di-repeat Primer Pair	2 tubes, 300,000 pmol	4304978
Di-repeat + Tail Primer Pair	2 tubes, 10,000 pmol	4304979
Di-repeat + Tail Primer Pair	2 tubes, 80,000 pmol	4304981
Di-repeat + Tail Primer Pair	2 tubes, 300,000 pmol	4304982

KRAS and BRAF Mutation Analysis Reagents

Designed to facilitate clear, comprehensive, sensitive testing

The epidermal growth factor receptor (EGFR) pathway is a complex signaling cascade that is associated with the development and progression of many cancer conditions. KRAS and BRAF gene mutations are present in a number of cancers, including those of the colon, lung, pancreas, biliary tract, endometrium, and ovary. It has been shown that approximately 35–45% of metastatic colorectal cancer (mCRC) tumors may have a KRAS or BRAF mutation, which makes them less likely to respond to anti-EGFR therapies. Identifying these mutations is therefore of great importance in clinical and pharmaceutical research.



The protein products of the KRAS and BRAF genes perform essential functions in the epidermal growth factor (EGF) signaling pathway. Because of its involvement in the regulation of cell proliferation, the EGF pathway is the object of study of many cancer researchers.

KRAS Mutation Analysis Reagents

KRAS Mutation Analysis Reagents employ a simple fragment analysis workflow to detect 1% mutant to wild type genomic DNA across 12 common and rare mutations in the KRAS gene region (Table 13). The KRAS reagent set provides sufficient reagent for the analysis of 30 samples.

- **Simple analysis**—unambiguous, easy-to-interpret results
- **Thorough coverage**—detects 12 mutations in the KRAS gene
- **Sensitive**—detects mutations at frequencies as low as 1–5% against a wild type genomic DNA background
- **Efficient**—interrogate multiple loci from the same sample in a minimum number of tubes

Table 13. Mutations interrogated using the KRAS Mutation Analysis Reagents.

KRAS codon 12 mutations	KRAS codon 13 mutations
Gly12Ser (GGT>AGT)	Gly13Ser (GGC>AGC)
Gly12Arg (GGT>CGT)	Gly13Arg (GGC>CGC)
Gly12Cys (GGT>TGT)	Gly13Cys (GGC>TGC)
Gly12Asp (GGT>GAT)	Gly13Asp (GGC>GAC)
Gly12Ala (GGT>GCT)	Gly13Ala (GGC>GCC)
Gly12Val (GGT>GTT)	Gly13Val (GGC>GTC)

Product	Quantity	Cat. No.
KRAS Mutation Analysis Reagents	1	4452080

BRAF Mutation Analysis Reagents

BRAF Mutation Analysis Reagents employ a simple fragment analysis workflow to detect 1% mutant to wild type genomic DNA across 3 common and rare mutations in the BRAF gene region (Table 14). The BRAF reagent set provides sufficient reagent for analysis of 30 samples.

- **Simple analysis**—unambiguous, easy-to-interpret results
- **Thorough coverage**—detects 3 mutations in the BRAF gene
- **Sensitive**—detects mutations at frequencies as low as 1–5% against a wild type genomic DNA background
- **Efficient**—interrogate multiple loci from the same sample in a minimum number of tubes

Table 14. Mutations interrogated using the BRAF Mutation Analysis Reagents.

BRAF mutations
Val600Glu (GTG>GAG)
Val600Gly (GTG>GCG)
Val600Ala (GTG>GGG)

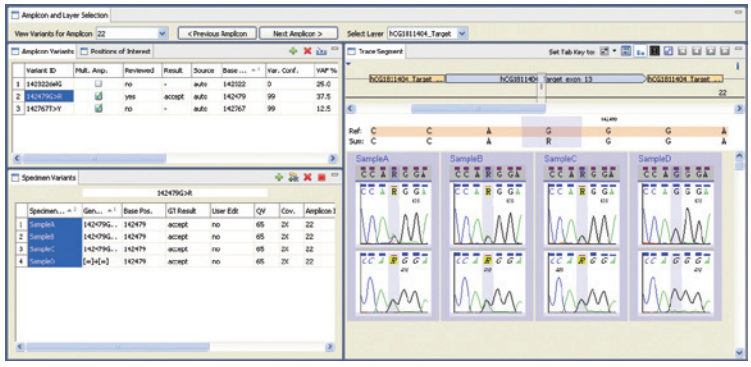
Product	Quantity	Cat. No.
BRAF Mutation Analysis Reagents	1	4452136

Genetic Analysis Software

Variant Reporter® Software for Resequencing

- Discovers variants including insertions, deletions, SNPs, and HIM breakpoints
- Minimizes manual review time with ease of use, targeted visual review, and highly accurate algorithms that help reduce false positives
- Handles 5,000 sample files, eliminating need to break up projects

Variant Reporter® Software discovers variants, determines genotypes, and creates a report. Designed for basic and clinical researchers engaged in direct sequencing projects and for core resequencing laboratories focused on secondary analysis, this new software dramatically reduces the time required for data analysis and review. It provides high-quality trace, consensus, and variant metrics. The software is optimized for use with Applied Biosystems® sequencing reagents and instruments.



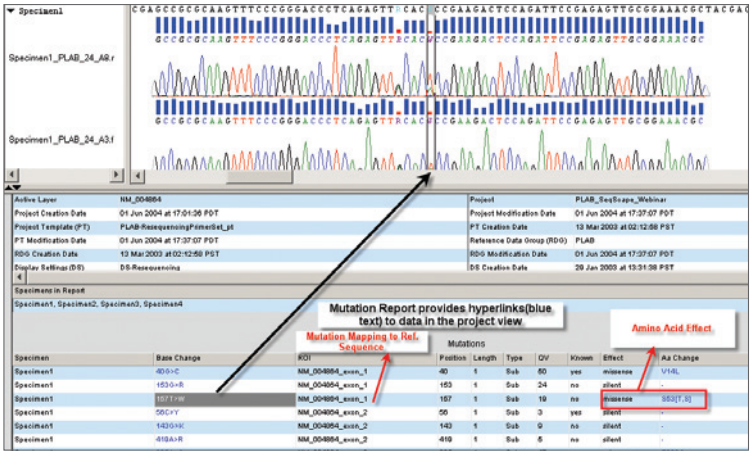
Variant Reporter® Software supports fast, accurate heterozygote calling.

Product	Quantity	Cat. No.
Variant Reporter® Software v1.1, 30-Day Demo Free download available at www.lifetechnologies.com/variantreporter	1 CD	4385270
Variant Reporter® Software v1.1 Multiple software license pricing is available. Please contact your Life Technologies sales representative.	1 license	4385261

SeqScape® Software for Sequencing Data Analysis

- Generates customized reports with mutations hyperlinked to source electropherograms
- Linked to Data Collection Software for automatic data processing

Applied Biosystems® SeqScape® Software processes genetic analysis data for reference-based analyses such as mutation detection and analysis, SNP discovery and validation, pathogen subtyping, allele identification, and sequence confirmation. SeqScape® Software filters low-quality and anomalous data, and offers basecalling quality values for all bases, consensus sequences, and mutations. The consensus caller uses quality values, sequence coverage, and data orientation information. The software is optimized for use with Applied Biosystems® sequencing reagents and instruments.



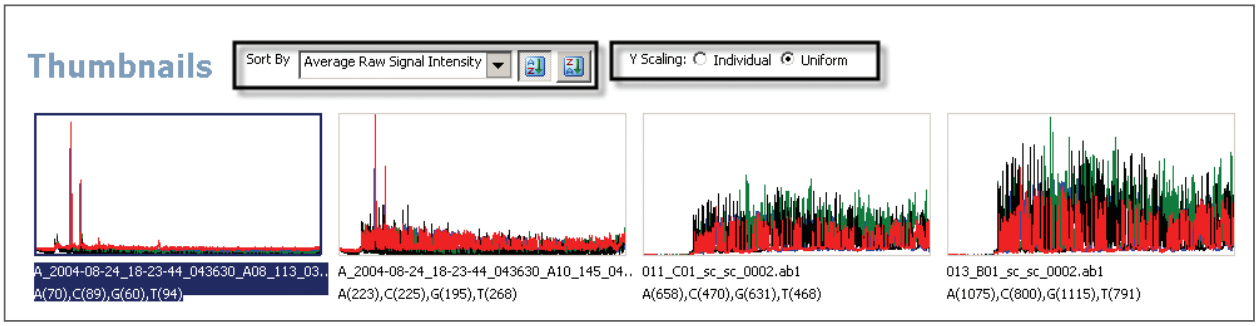
View mutations across a project using hyperlinks between the report and the data.

Product	Quantity	Cat. No.
SeqScape® Software v2.7	1 license	4327091
SeqScape® Software Upgrade v2.6 to v2.7	1 CD	4332045
SeqScape® Software v2.7 45-Day Demo	1 license	4454960

Free! Sequence Scanner Software for Sequence Data Viewer

- Review all traces in thumbnail format and sort them by trace quality
- Spot sample failures readily
- Export traces into commonly used presentation formats such as jpeg and pdf

Freeware Sequence Scanner Software enables you to view, edit, print, and export sequence data generated on Applied Biosystems® genetic analyzers. The software generates graphically expressive reports, offers multiple viewing options, and simultaneously displays raw and analyzed data.



Identify failed traces easily using the thumbnails view.

Product	Quantity	Cat. No.
Sequence Scanner Software v1.0 Free download at www.lifetechnologies.com/sequencescanner	1	NA

5

Sequencing Analysis Software with KB™ Basecaller

- Obtain long read lengths
- Increase accuracy at the 5´ end and in noisy or anomalous regions
- Automatically filter low-quality sequences and ends

This data-review software basecalls, trims, displays, edits, and prints data from all Applied Biosystems® capillary electrophoresis instruments. Our significantly improved signal processor, the KB™ Basecaller, now yields up to 100 more high-quality bases than other basecalling algorithms. The algorithm allows longer read lengths with high-quality base pairs, mixed basecalling with quality values, and accurate basecalling of troublesome short PCR fragments. Quality control reports provide read-length and sample scores for each sample file, enabling you to sort data by quality. To make reviewing data even easier, each QC report is hyperlinked back to its source data.

Basecall, view, and edit sequence files using Sequencing Analysis Software.

Product	Quantity	Cat. No.
Sequencing Analysis Software Upgrade v5.3.1 to v5.4 *Note: 3130 and 3730 series systems require Data Collection Software v3.1.1*	1 CD	4310991
Sequencing Analysis Software v5.4	1 license	4360967

Multiple software license packages are available. Please contact your Applied Biosystems sales representative for upgrade promotions.

5

Free! Methyl Primer Express® Software for Methylation-Specific Primer Design

- Predicts CpG islands in known DNA sequences
- Simulates bisulfite modification
- Designs robust MSP and BSP primers
- Annotates transcription start base and translation start codon
- Highlights target regions of interest and displays boundaries in primer design report

Methyl Primer Express® Software designs methylation-specific (MSP) and bisulfite-sequencing (BSP) primers for methylated DNA sequencing. To register and download the software, please complete the short registration form at www.appliedbiosystems.com/methylprimerexpress.

A BSP Primer Report, one of the many reports generated by Methyl Primer Express® Software.

Product	Quantity	Cat. No.
Methyl Primer Express® Software v1.0 Free download at www.lifetechnologies.com/methylprimerexpress	1 each	NA
Methyl Primer Express® Software v1.0 on CD	1 CD	4376041

5

GeneMapper® Software

- Increase data processing efficiency with distributed computing
- Microsatellite analysis methods
- Marker-specific analysis methods

GeneMapper® Software is a flexible genotyping software package that provides DNA sizing and quality allele calls for all Life Technologies capillary electrophoresis–based genotyping systems. GeneMapper® Software enables a basic sizing/peak detection analysis workflow as well as enabling multi-application functionality, including amplified fragment length polymorphism (AFLP®), loss of heterozygosity (LOH), microsatellite, and SNP genotyping analysis. The software uses Process Quality Values (PQVs) for automated identification that reduces data review time for high-throughput genotyping. In addition, the security and audit features help users meet 21 CFR Part 11 requirements.

GeneMapper® Software can be installed as a client-server system or as stand-alone software ("Full" version, having client and database installed on a single computer). Individual GeneMapper® Software client applications can be installed on remote computers, and on GeneMapper® client-server installations all clients connect to the central database via a TCP/IP network within the same firewall or LAN. This feature allows data to be shared and/or stored in the central database.

GeneMapper® Software sample plot.

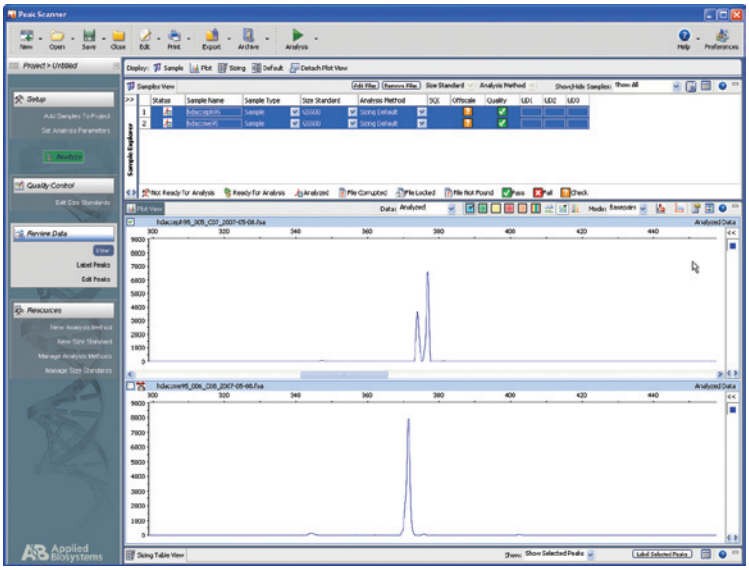
Product	Quantity	Cat. No.
GeneMapper® Software v4.1.1	1	4366925
GeneMapper® Software v4.1.1 Conversion from v3.7 or older, convert to full	1	4370784
GeneMapper® Software v4.1.1 Documentation	1	4366853
GeneMapper® Software 4.1.1 Client	1	4366846
GeneMapper® Software 4.1.1 Client	5	4366847
GeneMapper® Software 4.1.1 30-Day Demo	1	4366851

Multiple software license packages are available. Please contact your Applied Biosystems sales representative.

Free! Peak Scanner™ Software for DNA Fragment Sizing

- Applications include BAC fingerprinting, microsatellite analysis, mutation screening (SSCP), and genetic footprinting
- Handles large fragment sizing up to 1,200 base pairs
- Intuitive user interface with more action buttons and fewer drop down menus

Peak Scanner™ Software separates DNA fragments by size, provides a profile of the separation, and precisely calculates each fragment size. The software allows you to view, edit, analyze, print, and export fragment analysis data generated on all Applied Biosystems® genetic analyzers. Peak Scanner™ Software is a DNA sizing software that can either be downloaded for free or purchased as a software kit through the website.



Peak Scanner™ Software showing sample data, multi-dye plots, and sizing table.

Product	Quantity	Cat. No.
Peak Scanner™ Software v1.0 for DNA Fragment Sizing Free download at www.lifetechnologies.com/peakscanner	1 each	NA

5

Index

Alphabetical Index

Numbers

A

B

C

D

E

F

G

H

I

K

M

P

R

S

T

V

W

Numerical Index

Appendix

Contents

Legal Statements

1 Limited Use Label License No: 358: Research Use Only.

Limited Use Label License No: 358: Research Use Only

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