

ABI PRISM[®] 3100 Genetic Analyzer

The Tradition of Excellence Continues

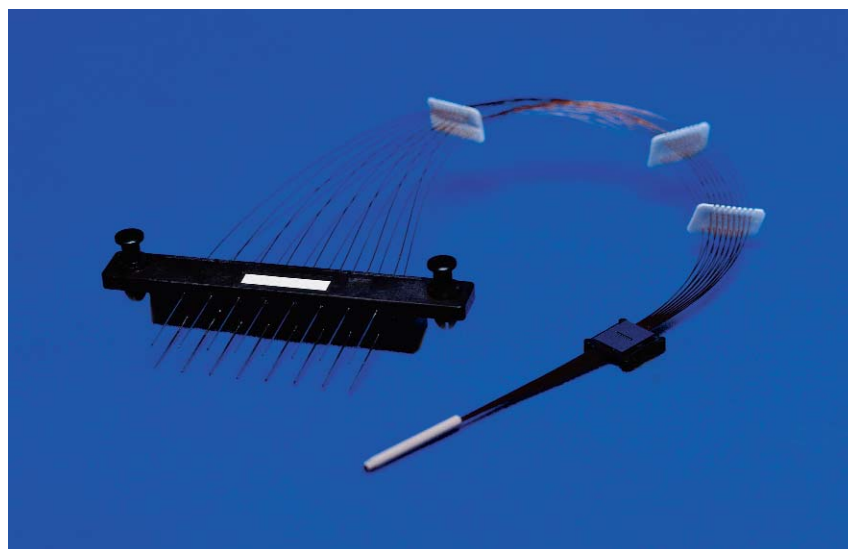
In the tradition of the ABI PRISM 310 Genetic Analyzer and 3700 DNA Analyzer, Applied Biosystems continues to provide excellence in the capillary electrophoresis market with the ABI PRISM 3100 Genetic Analyzer. The ABI PRISM 3100 Genetic Analyzer is a fluorescence-based DNA analysis system utilizing the proven technology of capillary electrophoresis with 16 capillaries operating in parallel. The 3100 Genetic Analyzer is fully automated from sample loading to data analysis. The 3100 Genetic Analyzer has been optimized to support a variety of applications including comparative sequencing and DNA fragment analysis to meet your research needs.

Key Features

- 16 capillaries
- 24-hour unattended operation
- Easy instrument set-up
- Automated polymer filling and sample injection from both 96- and 384-well microtiter plate formats
- Multiple applications supported
- ABI PRISM separation polymers
- Multiple dye detection

Components

The ABI PRISM 3100 Genetic Analyzer consists of the following components:



Sixteen-Capillary Array

- Capillary electrophoresis instrument
- Computer workstation for instrument control and data analysis
- Software for sample ID import, instrument control and data collection
- Analysis software and algorithms: Sequencing Analysis Software for basecalling
GeneScan[®] Analysis Software for fragment sizing validation and screening

Capillary Arrays

The internally uncoated capillaries are supplied in pre-assembled arrays of sixteen. The arrays are available in multiple lengths to provide support for multiple applications and run method-

ologies. The capillary arrays are specified to last for 100 runs and are designed for use with industry standard 96- and 384-well microtiter plates.

Separation Matrix

The ABI PRISM 3100 Genetic Analyzer can use either POP-4[™] or POP-6[™] polymers (Performance Optimized Polymer) as the separation matrix. Before each run, the capillaries are automatically replenished with fresh electro-osmotic flow (EOF) suppression polymer.

Reagents

Applied Biosystems provides the following reagents for use on the 3100 system:

- Sequencing Analysis Reagents
 - BigDye® Terminator Kits
 - dGTP BigDye Terminator Kit
 - BigDye Primer Kit
 - dRhodamine Dye Terminator Kit
- Fragment Analysis Reagents
 - Linkage Mapping Set Version 2.5
 - GeneScan™ 400 HD Size Standard
 - GeneScan 500 Size Standard
 - GeneScan – 120 Liz® Size Standards
 - Application Specific Kits

Contact Applied Biosystems for application kits in:

- Agriculture
- Disease Research
- Human Identification
- Microbial Identification

Software

The ABI PRISM® 3100 Genetic Analyzer includes software for automated electronic sample information import, data collection and data analysis. Sample files are generated in the industry standard ABIF format. Sample file analysis is performed with Sequencing Analysis or GeneScan® Analysis Software running on Windows NT® platform. Basecalling and sizecalling algorithms have been optimized for data from the 3100 Genetic Analyzer. Sample files can be viewed on Windows NT and Macintosh® platforms.

Additional ABI PRISM Software

Sequence Collector® Software (formerly BioLIMS™ Genetic Information)

Genotyper® Software

GeneMapper™ Software

SeqScape™ Software

SQL* GT™ Software

Sample Requirement

The 3100 system can analyze many types of templates prepared by a variety of different sample preparation protocols. Samples are automatically injected directly from 96- or 384-well microtiter plates.

Laser

Argon-ion multi-line, single mode laser primary excitation lines: 488 and 514.5 nm.

Detection and Optics

The ABI PRISM 3100 Genetic Analyzer uses excitation and detection optics that provide for enhanced signal uniformity. The capillary outer diameter (od), inner diameter (id) and pitch have been optimized to minimize loss of signal due to refraction. The detection optics provide low noise, full spectrum data simultaneously from all 16 capillaries.

Electrophoresis Voltage

Up to 20 kV

Operating Temperature Range

18°C to 65°C

Computer Requirements

Hardware: Pentium III Processor 1GHz

Operating system: Windows NT 4.0

Installed RAM: 256 MB

Hard Disk Storage: dual 18 GB hard drives

Monitor: flat screen 17" color display

Operating Environment

Temperature: 15°C to 30°C

Room temperature should not fluctuate +/-2° when the instrument is running

Humidity: 20%–80% (non-condensing)

Main Power

Voltage

200–220V or 230–240V +/- 10%, 50/60 Hz +/- 10 %

Current

Maximum 15 amps

Maximum Power Dissipation

2,000 watts (approximately)

Dimensions

Electrophoresis Unit:

Width (with door closed): 74 cm

Width (with door open): 148.6 cm (left and right door open simultaneously)

Depth: 54.8 cm

Height: 81 cm

Weight: approximately 130 kg

Service and Warranty

One-year limited warranty on parts and labor

Service installation

Application training

Support

Worldwide applications support and service is offered from expert technical specialists and scientists.

Performance and Throughput Chart

	Example Applications	Performance	Polymer	Capillary*	Time** and Temp	Size	Throughput (per 24 hrs)
Ultra Rapid Sequencing Protocol	Comparative Sequencing and SNP Discovery	98.5% base calling accuracy with Sequencing Analysis basecaller	Performance Optimized Polymer 4 (POP-4™ polymer)	Ld=36-cm	40 minutes at 50°C	500 nt	288,000 base calls (36 runs x 16 capillaries x 500 base calls per capillary)
Rapid Sequencing Protocol	Comparative Sequencing and SNP Discovery	98.5% base calling accuracy with Sequencing Analysis basecaller	Performance Optimized Polymer 6 (POP-6™ polymer)	Ld=36-cm	60 minutes at 50°C	500 nt	192,000 base calls (24 runs x 16 capillaries x 500 base calls per capillary)
Standard Sequencing Protocol	DNA Sequencing	98.5% base calling accuracy with Sequencing Analysis basecaller	Performance Optimized Polymer 6 (POP-6™ polymer)	Ld=50 cm	2 hours 30 minutes at 50°C	650 nt	93,600 calls (9 runs x 16 capillaries x 650 base calls per capillary)
Long Read Sequencing Protocol	DNA Sequencing	98.5% base calling accuracy with Sequencing Analysis basecaller	Performance Optimized Polymer 4 (POP-4™ polymer)	Ld=80 cm	3 hours 40 minutes at 50°C	950 nt	91,200 base calls (6 runs x 16 capillaries x 950 base calls per capillary)
DNA Sizing	4 color fluorescence Microsatellite Analysis and Comparative Genotyping	Single base detection up to 400 bases with ± 0.15 bp standard deviation (36-cm) Single base detection up to 400 bases with .4-.6 bp standard deviation (22-cm)	Performance Optimized Polymer 4 (POP-4™ polymer)	Ld= 36-cm	45 minutes (36-cm) at 60°C	400 nt	7,680 genotypes using 36-cm
				Ld= 22-cm	20 minutes (22-cm) at 60°C		17,280 genotypes using 22-cm
DNA Sizing	5 color fluorescence Microsatellite Analysis and Comparative Genotyping	Single base detection up to 400 bases with ± 0.15 bp standard deviation (36-cm) Single base detection up to 400 bases with .4-.6 bp standard deviation (22-cm)	Performance Optimized Polymer 4 (POP-4™ polymer)	Ld= 36-cm	45 minutes (36-cm) at 60°C	400 nt	10,240 genotypes using 36-cm
				Ld= 22-cm	20 minutes (22-cm) at 60°C		23,040 genotypes using 22-cm
Mutation Validation/ Screening	Standard and High-Throughput SNP Validation and Screening	Single nucleotide polymorphism identification by five color fluorescence up to 100 bases	Performance Optimized Polymer 4 (POP-4™ polymer)	Ld= 36-cm,	30 minutes (36-cm) at 60°C	100 nt	7,680 genotypes using 36-cm
				Ld= 22-cm	15 minutes (22-cm) at 60°C		15,360 genotypes using 22-cm

*Capillary inner diameter (i.d.) = 50µm for all 3100 capillary arrays
 **The amount of time for the size fragment to be detected includes capillary filling and electrophoresis run time
 Ld = Length to detector
 nt = nucleotides
 GTs = Genotypes

Example Applications	Polymer	Capillary	Buffer
Ultra Rapid Sequencing	3100 POP-4™ polymer	3100 Capillary Array 36-cm Ld x 50 µm id	10x Buffer w EDTA
	p/n 4316355	p/n 4315931	p/n 402824
Rapid Sequencing	3100 POP-6™ polymer	3100 Capillary Array 36-cm Ld x 50 µm id	10x Buffer w EDTA
	p/n 4316357	p/n 4315931	p/n 402824
Standard Sequencing	3100 POP-6™ polymer	3100 Capillary Array 50-cm Ld x 50 µm id	10x Buffer w EDTA
	p/n 4316357	p/n 4315930	p/n 402824
Microsatellite and SNP Analysis	3100 POP-4™ polymer	3100 Capillary Array 36-cm Ld x 50 µm id	10x Buffer w EDTA
	p/n 4316355	p/n 4315931	p/n 402824
Long Read Sequencing	3100 POP-4™ polymer	3100 Capillary Array 80-cm Ld x 50 µm id	10x Buffer w EDTA
	p/n 4316355	p/n 4319899	p/n 402824
Additional Consumables	Part Number	Additional Consumables	Part Number
MicroAmp® 96-well reaction plates	N8010560	384-well plate septa	4315934
MicroAmp® 384-well reaction plates	4305505	Hi-Di™ formamide	4311320
96-well plate septa	4315933	Reservoir septa	4315932

Ld = length to detector id = inner diameter

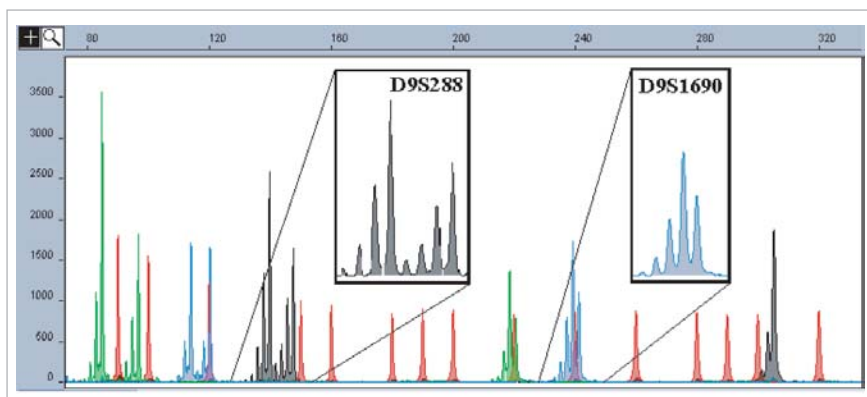


Figure 2. GeneScan™ Installation Standard run on the ABI PRISM® 3100 Genetic Analyzer with POP-4™ polymer.

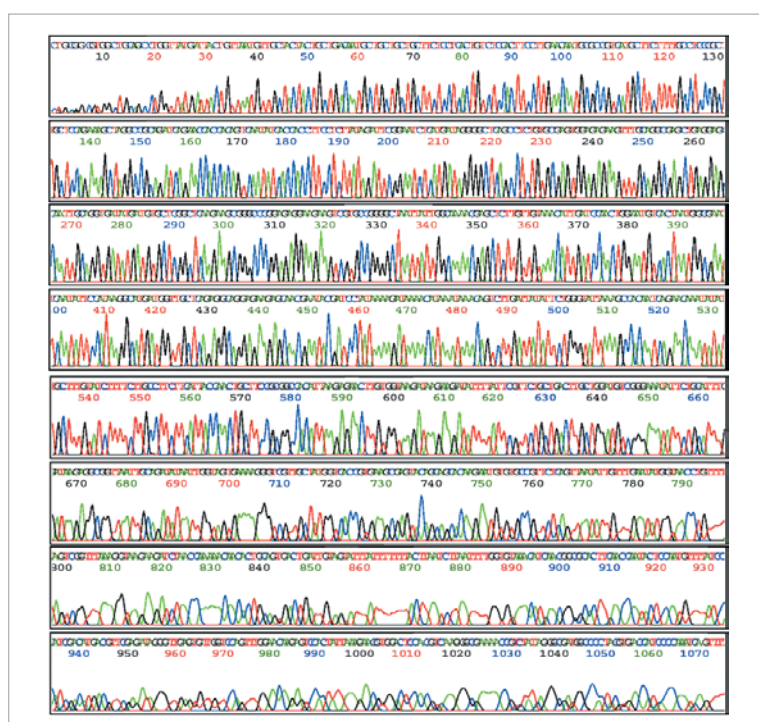


Figure 3. The above electropherogram is an example of a typical long read sequence obtained from a BigDye® Terminator Sequencing Standard v 3.0. A read length of greater than 1,000 bp with 98.5% accuracy was achieved using POP-4™ polymer and the 80-cm capillary array. Total run time 3 hr 40 min.

Ordering Information

Description	Part Number
ABI PRISM® 3100 Genetic Analyzer	3100-01

Included with Order:

- ABI PRISM 3100 Genetic Analyzer User's Manual
- Choice of Sequencing or GeneScan® Analysis Software
- Quick Start Guide for Sequencing or Fragment Analysis
- ABI PRISM 3100 DNA Sequencing Chemistry Guide
- ABI PRISM Sequencing Analysis or GeneScan Analysis Software Manual
- One-year Limited Warranty on Parts and Labor
- Service Installation and Chemical Installation Kit
- Application Training
- Two Capillary Arrays
- ABI PRISM 3100 Genetic Analyzer Training CD



iScience. To better understand the complex interaction of biological systems, life scientists are developing revolutionary approaches to discovery that unite technology, informatics, and traditional laboratory research. In partnership with our customers, Applied Biosystems provides the innovative products, services, and knowledge resources that make this new, **Integrated Science** possible.

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