

# ABI PRISM® 3100-*Avant* Genetic Analyzer

## Keeping pace with your throughput needs

Based upon the ABI PRISM 3100 system, the 3100-*Avant* system offers a completely automated solution for low-to-medium throughput laboratories. You can analyze hundreds of sequencing and fragment analysis samples in a single day with complete automation.

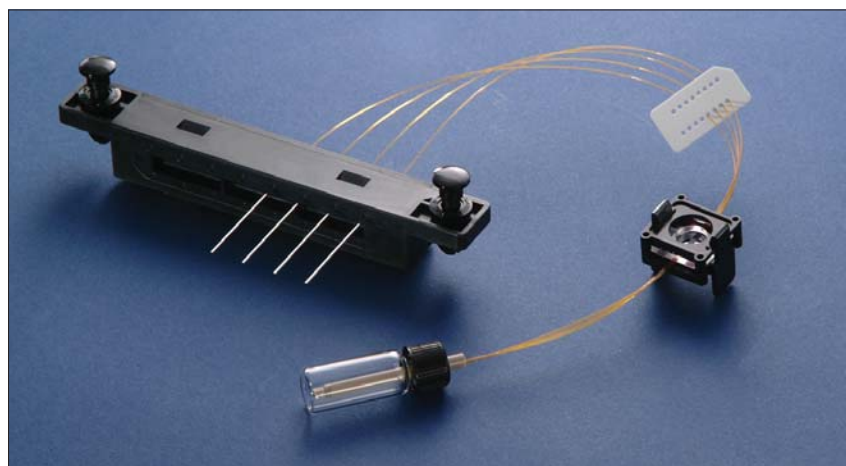
## Upgrade Option

You can upgrade the 3100-*Avant* system to a 16-capillary ABI PRISM 3100 Genetic Analyzer. The upgrade option provides an opportunity to quadruple the daily throughput, without the purchase of an additional instrument.

## Ultra Rapid Sequencing

The ABI PRISM 3100-*Avant* Genetic Analyzer now includes an additional module for sequencing in a higher throughput mode. The Ultra Rapid Sequencing module increases the throughput of the instrument by more than 30%, providing a quality sequencing read in excess of 500 bp with 98.5% accuracy.

Now you can also perform sequencing and genotyping applications by using POP-4™ polymer and the 36 cm array without having to change either polymer type or array length. The Ultra Rapid Sequencing module further improves the productivity of the 3100-*Avant* system by enhancing its ease of use for resequencing, SNP discovery, SNP validation, and microsatellite analysis applications.



Four-Capillary Array

## Key Features

- Four capillaries
- Upgrade pathway to 16 capillaries
- 24-hour unattended operation
- Easy instrument setup
- 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-*Avant* Genetic Analyzer consists of the following components:

- 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 four. The arrays are available in 22 cm, 36 cm, 50 cm, and 80 cm lengths to provide support for multiple applications and run methodologies. The capillary arrays are specified to last for 150 runs and are designed for use with industry standard 96- and 384-well microtiter plates.

## Separation Matrix

The 3100-*Avant* system 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-*Avant* system:

- Sequencing Reagents
  - BigDye® Terminator v 1.0 kit
  - BigDye Terminator v 3.0 kit
  - dRhodamine Dye Terminator kit
- Fragment Analysis Reagents
  - Linkage Mapping Set v 2.5
  - SNaPshot® Multiplex Kit
  - GeneScan™-400 HD size standard
  - GeneScan-500 size standards
  - Application specific kits

### Contact Applied Biosystems for application kits in:

- Disease Research
- Human Identification
- Microbial Identification
- Agriculture

### Software

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

### Additional ABI PRISM Software

- Sequence Collector Software (formerly BioLIMS® Software)
- Genotyper® Software
- GeneMapper™ Software
- SeqScape™ Software
- SQL\*GT™ Software

### Sample Requirement

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

### Laser

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

### Detection and Optics

The ABI PRISM 3100-*Avant* Genetic Analyzer uses a single argon-ion laser to illuminate four capillaries mounted in a planar array. The capillary outer diameter (od), inner diameter (id), and pitch have been optimized to minimize loss of signal from refraction. The 3100-*Avant* system uses dual side illumination to further improve signal uniformity. The light from the array is collected by a spectrograph system with a CCD camera detector that simultaneously provides low-noise, full-spectrum data from all four capillaries.

### Electrophoresis Voltage

Up to 20 kV

### Operating Temperature Range

18°C to 65°C

### Computer Requirements

- Hardware: Pentium 4 Processor, 2 GHz

- Operating system: Windows NT 4.0
- Installed RAM: 1 GB
- Hard Disk Storage: dual 36 GB hard drives
- Monitor: 17" color display

### Operating Environment

- Temperature: 15°C to 30°C
- Room temperature should not fluctuate +/- 2°C, when the instrument is running
- Humidity: 20%–80% (non-condensing)

### Main Power

#### Voltage

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

#### Current

- Maximum 15 A

#### Maximum Power Dissipation

- 2,000 W (approximately)

### Dimensions

Electrophoresis Unit:

Width: 74 cm (with doors closed)

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

Depth: 54.8 cm

Height: 81 cm

Weight: 130 kg (approximately)

### Service and Warranty

- One-year limited warranty on parts and labor
- Service installation
- Application training

### Support

Our team of expert technical specialists and scientists offer worldwide applications support and service.

## 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% basecalling accuracy with Sequencing Analysis basecaller	POP-4™ polymer	Ld = 36 cm	40 minutes at 50°C	500 nt	72,000 bases
Rapid Sequencing Protocol	Comparative Sequencing and SNP Discovery	98.5% basecalling accuracy with Sequencing Analysis basecaller	POP-6™ polymer	Ld = 36 cm	60 minutes at 50°C	500 nt	48,000 bases
Standard Sequencing Protocol	DNA Sequencing	98.5% basecalling accuracy with Sequencing Analysis basecaller	POP-6™ polymer	Ld = 50 cm	2.5 hours at 50°C	650 nt	23,400 bases
Long Read Sequencing Protocol	DNA Sequencing	98.5% basecalling accuracy with Sequencing Analysis basecaller	POP-4™ polymer	Ld = 80 cm	3.5 hours at 50°C	950 nt	22,800 bases
DNA Sizing	Microsatellite Analysis and Comparative Genotyping	Single base detection up to 400 bases with 0.15 standard deviation	POP-4™ polymer	Ld = 22 cm, 36 cm†	20 minutes (22 cm),	400 nt	5,760 GTs (22 cm)
					45 minutes (36 cm) at 60°C		2,560 GTs (36 cm)
Mutation Validation/ Screening	SNP Validation and Screening	Single nucleotide polymorphism identification by five-color fluorescence up to 100 bases	POP-4™ polymer	Ld = 22 cm	20 minutes at 60°C	100 nt	3,840 GTs

\* Capillary inner diameter (id) = 50 µm for all four capillary arrays

\*\* The amount of time for the size fragment to be detected includes capillary filling and electrophoresis run time

\*\*\* Basecalling begins at base 21

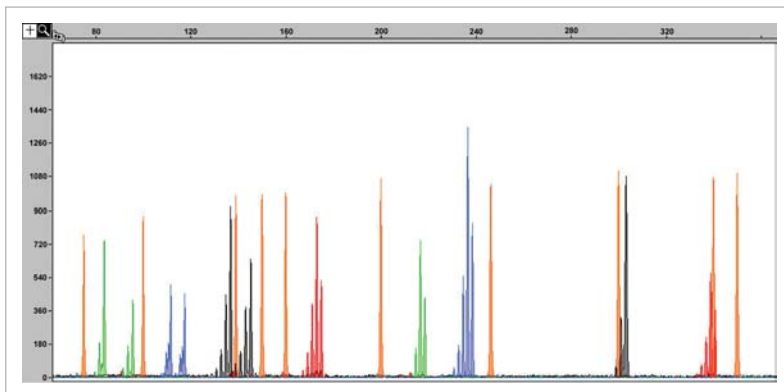
† For optimal resolution, as in the case of fine mapping, Applied Biosystems recommends using the 36 cm capillary array. However, the 22 cm capillary array can be used to rapidly scan the genome when using markers less than 360 bp.

Ld = length to detector  
nt = nucleotides  
GTs = genotypes

Example Applications	Polymer	Capillary	Buffer
Ultra Rapid Sequencing	3100 POP-4™ polymer p/n 4316355	3100- <i>Avant</i> Capillary Array 36 cm Ld x 50 µm id p/n 4333464	10X Buffer w/ EDTA p/n 402824
Rapid Sequencing	3100 POP-6™ polymer p/n 4316357	3100- <i>Avant</i> Capillary Array 36 cm Ld x 50 µm id p/n 4333464	10X Buffer w/ EDTA p/n 402824
Standard Sequencing	3100 POP-6™ polymer p/n 4316357	3100- <i>Avant</i> Capillary Array 50 cm Ld x 50 µm id p/n 4333466	10X Buffer w/ EDTA p/n 402824
Long Read Sequencing	3100 POP-4™ polymer p/n 4316355	3100- <i>Avant</i> Capillary Array 80 cm Ld x 50 µm id p/n 4333465	10X Buffer w/ EDTA p/n 402824
Microsatellite and SNP Analysis	3100 POP-4™ polymer p/n 4316355	3100- <i>Avant</i> Capillary Array 36 cm Ld x 50 µm id p/n 4333464 22 cm Ld x 50 µm id p/n 4333463	10X Buffer w/ EDTA p/n 402824

Ld = length to detector  
id = inner diameter

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



The GeneScan™ Installation Standard and the GeneScan 500 LIZ® Size Standard run with POP-4™ polymer and a 36 cm capillary array.



BigDye® Terminator Sequencing Standard run on the ABI Prism® 3100-Avant Genetic Analyzer with POP-6™ polymer.

## Ordering Information

Description	Part Number
ABI PRISM® 3100-Avant Genetic Analyzer	3100-Avant
Included with order:	
ABI PRISM 3100-Avant Genetic Analyzer Quick Reference Guide	
ABI PRISM 3100/3100-Avant User's Manual	
Choice of Sequencing Analysis or GeneScan® Analysis Software	
One-year limited warranty on parts and labor	
Service installation and chemical installation kit	
Application training	
Two capillary arrays	



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