

# PCR amplification



Catalog

# PCR Enzymes & Instruments

## Breaking Ground

Stratagene was the first to purify and commercialize high-fidelity Pfu DNA polymerase from the deep-sea archaea, *Pyrococcus furiosus*. Because it is derived from a hyperthermophile that grows optimally at 100°C, Pfu DNA polymerase is the most thermostable PCR enzyme available. Since its introduction, we have improved upon Pfu's accuracy and developed novel, high-performance PCR enzymes and master mixes for a variety of applications. We are committed to continually developing improved enzymes, reagents and methods for PCR. You can rely on us for a wide selection of innovative products for faster, more accurate, and robust PCR amplification.

## The ArchaeMaxx® Factor Advantage

A key component of many of our PCR enzymes is the patented ArchaeMaxx® Polymerase-Enhancing Factor. Our scientists discovered the ArchaeMaxx factor and have included it in our PfuUltra™ II, PfuTurbo®, Hercules® II, and EXL® high-fidelity, Pfu-based DNA polymerases. The ArchaeMaxx factor improves the PCR performance of Pfu-based DNA polymerases by overcoming dUTP poisoning, which is caused by dUTP accumulation during PCR due to dCTP deamination. Once incorporated, dU-containing DNA inhibits Pfu and other archaeal proofreading polymerases, limiting their efficiency. The ArchaeMaxx factor eliminates inhibition by eliminating the dUTP, facilitating improved overall PCR performance, promoting shorter extension times, higher yield, and greater target length amplification capability.

### High-Fidelity PCR

Application	Product	Advantages	Page No.
Highest-fidelity cloning, Site-directed mutagenesis	PfuUltra™ II Fusion HS DNA Polymerase	+ Lowest error rate of any PCR enzyme (20X more accurate than Taq) + Improved reliability + 70-80% faster cycling time + Amplify up to 19 kb in a fraction of the time	4
	PfuUltra™ High-Fidelity DNA Polymerase	+ Low error rate (18X more accurate than Taq) + Optimized high-fidelity buffer + Contains ArchaeMaxx® factor for high-performance up to 17 kb + Available as a hotstart enzyme and in a master mix format	5
High-fidelity PCR cloning, Site-directed mutagenesis	PfuTurbo® DNA Polymerase	+ Robust performer with very low error rate (6X more accurate than Taq) + Contains ArchaeMaxx® factor for high-performance up to 19 kb + Available as a hotstart enzyme and in a master mix format	6
	Pfu DNA Polymerase	+ Low error rate (6X more accurate than Taq) + Half-life of 19 hours at 95°C + Native and cloned versions available	7
High-fidelity cloning with decontamination protocol	PfuTurbo® C <sub>x</sub> Hotstart DNA Polymerase	+ Pfu mutant overcomes uracil-related poisoning + Incorporates dUTP for UNG decontamination protocols	7

### Superior Yield for Routine PCR

Application	Product	Advantages	Page No.
Superior PCR yield on all targets including GC-rich targets	Hercules® II Fusion DNA Polymerase	+ Fidelity comparable to Pfu + Robust yield and excellent reliability + 70-80% faster cycling time + Universal buffer for routine PCR and GC-rich targets + Contains ArchaeMaxx® factor for high-performance	8
GC-rich targets	Hercules® Enhanced DNA Polymerase	+ Robust amplification of challenging PCR targets, including GC-rich genomic DNA + Pfu-based blend for higher fidelity than Taq-based blends + Available as hotstart enzyme and in a master mix format	9

## High Sensitivity

Application	Product	Advantages	Page No.
Sensitive amplification, High yields	PicoMaxx® High-Fidelity PCR System & Master Mix	+ High sensitivity and yield + Amplify up to 10 kb + Hotstart for high specificity + Available in a master mix format	10

## Endpoint PCR

Application	Product	Advantages	Page No.
Fast and high yield endpoint PCR	Paq5000™ DNA Polymerase	+ Economic alternative to Taq + High PCR yield + Fast cycling conditions	11
Amplification with high specificity	SureStart® Taq DNA Polymerase	+ Hotstart version of Taq2000™ DNA polymerase + Ideal for room temperature set up + Improved specificity and sensitivity + Tested in quantitative PCR	12
Endpoint PCR	Taq2000™ DNA Polymerase	+ Virtually eliminates background artifacts + Minimizes smearing in long PCR + Most thermostable Taq DNA polymerase	13
PCR directly from blood	SureDirect Blood PCR Kit	+ Save time with this streamline workflow + No DNA Yield loss from DNA extraction + Versatile and robust performance	13
Mycoplasma Detection	Mycoplasma Assay Kits	+ Easy protocol + Rapid results	13

## PCR Optimization

Application	Product	Advantages	Page No.
PCR and primer extension reaction	Deoxynucleotide Mix, PCR-grade	+ High quality, reliable deoxynucleotides + Withstands multiple freeze-thaw cycles while producing high quality reaction products	14
Increased yield and target-length capability of Taq DNA polymerase	Taq Extender™ PCR Additive	+ Increases yield of templates up to 10 kb + Improves reliability of PCR + Improves PCR amplification of difficult templates	14
Increased PCR specificity	Perfect Match® PCR Enhancer	+ Reduces or eliminates nonspecific amplification + Enhances amplification of difficult templates	15

## PCR Instruments & Accessories

Application	Product	Advantages	Page No.
PCR amplification	SureCycler 8800 Thermal Cycler	+ 12 temperature gradient functionality without sacrificing accuracy or uniformity + One instrument that offers both fast cycling (6°C/sec ramp) and large volumes capacity (10-100 µl) + Modular 96-well and 384-well interchangeable blocks	16

## TA/UA Cloning

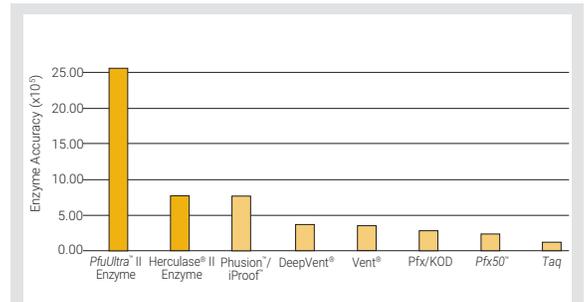
Application	Product	Advantages	Page No.
High-fidelity TA/UA cloning	Easy-A® High-Fidelity PCR Cloning Enzyme	+ Proofreading polymerase that adds 3'-A overhangs + Accuracy equivalent to Pfu DNA polymerase with cloning efficiency of Taq + Hotstart for high specificity + Available in a master mix for high throughput	21

## PCR amplification

# PfuUltra™ II Fusion HS DNA Polymerase

- Highest fidelity with great PCR success and reliability
- 70-80% quicker time to result
- High specificity hotstart formulation
- Amplify up to 19 kb genomic DNA
- Ideal for PCR cloning, RT-PCR, and site-directed mutagenesis

The PfuUltra™ II Fusion HS DNA Polymerase combines polymerase fusion technology with our engineered PfuUltra DNA polymerase, hotstart antibody, and proprietary ArchaeMaxx® Polymerase-Enhancing Factor to achieve extreme accuracy, excellent reliability, high specificity, and long target-length capability while dramatically reducing overall PCR extension times. Our PfuUltra II fusion HS DNA polymerase offers the new industry standard for ultra-high fidelity performance (see Figure).



PfuUltra™ II Fusion HS DNA Polymerase, the Highest Fidelity PCR Enzyme

The PfuUltra™ II Fusion HS DNA Polymerase exhibits accuracy 3-fold higher than the Phusion™/iProof™ DNA polymerases and 20-fold higher than Taq DNA Polymerase. The fidelity of each listed enzyme was measured using our validated and referenced fidelity assay (Accuracy is equal to 1/error rate).



We have dramatically increased the processivity of Pfu-based enzymes 12-fold over cloned PfuUltra polymerase by fusing our PfuUltra™ DNA Polymerase with a high affinity double-stranded DNA binding domain. This domain serves to better anchor the DNA polymerase, preventing early dissociation from the DNA template. While typical proofreading DNA polymerases require 1-2 minutes per kilobase extension times, the PfuUltra II enzyme allows the use of extension time as short as 15 sec/kb. The use of shorter extension times means that PCR cycling takes only one-third to one-fifth of the time required for non-fusion DNA polymerases, hence saving you time and improving template integrity by minimizing exposure to extreme cycling temperatures.

The improved processivity of our PfuUltra II fusion HS DNA polymerase, together with our proprietary ArchaeMaxx factor, enhances the reliability of its performance and improves the PCR yield. Our exclusive ArchaeMaxx factor eliminates dUTP poisoning which causes all other proofreading enzymes to stall. Our PfuUltra II polymerase is ideal for amplifying diverse clone collections which demand high fidelity, specificity, and throughput. It is also ideal for cloning into blunt-ended cloning vectors such as our StrataClone™ Blunt PCR Cloning Vectors.

### PfuUltra™ II Fusion HS DNA Polymerase

	Content	Amount	Catalog No.
PfuUltra™ II Fusion HS DNA Polymerase	PfuUltra™ II Fusion HS DNA Polymerase,	40 rxn	600670
	10X PfuUltra™ II Fusion HS DNA Polymerase Buffer	200 rxn	600672
		400 rxn	600674

# PfuUltra™ High-Fidelity DNA Polymerase

- Error rate 18-fold lower than Taq
- Delivers 300% greater accuracy than Pfu DNA polymerase
- Ideal for PCR cloning, RT-PCR, and site-directed mutagenesis



## High-Fidelity for Great Success

The PfuUltra™ High-Fidelity DNA Polymerase is made from a genetically engineered mutant of high-fidelity Pfu DNA polymerase that exhibits enhanced proofreading capability. In addition to its great accuracy, it includes our exclusive ArchaeMaxx® Polymerase-Enhancing Factor which provides robust PCR product yields, high sensitivity, and exceptional target-length capability.

## Hotstart Version

The PfuUltra hotstart DNA polymerase maintains the performance characteristics of PfuUltra high-fidelity DNA polymerase and enhances specificity when amplifying systems prone to primer-dimer or non-specific band formations. Additionally, this enzyme offers improved performance when performing robotic applications that require prolonged incubations at room temperature prior to thermal cycling and can be introduced into PCR protocols with no modification of cycling parameters. The PfuUltra hotstart DNA polymerase is also available in a convenient 2X master mix.

### PfuUltra™ DNA Polymerases

	Content	Amount	Catalog No.
PfuUltra™ High-Fidelity DNA Polymerase	PfuUltra™ High-Fidelity DNA Polymerase (2.5 U/μl), 10X PfuUltra™ Reaction Buffer	100 U	600380
		500 U	600382
		1000 U	600384
PfuUltra™ High-Fidelity DNA Polymerase Alternative Detergent	PfuUltra™ High-Fidelity DNA Polymerase AD, 100U PfuUltra™ High-Fidelity DNA Polymerase AD, 500U PfuUltra™ High-Fidelity DNA Polymerase AD, 1000U	100 U	600385
		500 U	600387
		1000 U	600389
PfuUltra™ Hotstart DNA Polymerase	PfuUltra™ Hotstart DNA Polymerase (2.5U/μl), 10X PfuUltra™ Reaction Buffer	100 U	600390
		500 U	600392
		1000 U	600394
PfuUltra™ Hotstart DNA Polymerase Alternative Detergent	PfuUltra™ Hotstart DNA Polymerase AD, 1000 U	1000 U	600396
PfuUltra™ Hotstart PCR Master Mix	2X PfuUltra™ Hotstart PCR Master Mix including dNTPs	100 rxn	600630
		400 rxn	600632

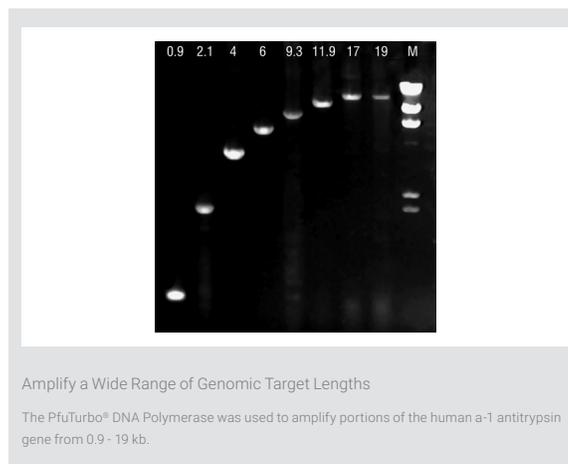
## PCR amplification

# PfuTurbo® DNA Polymerase

- Robust PCR product yields with a wide range of targets up to 19 kb genomic DNA
- Requires shorter extension times, fewer PCR cycles and less DNA than Pfu DNA polymerase
- Hotstart version available for enhanced specificity

### Robust, High-Fidelity PCR Amplification

Our PfuTurbo® DNA Polymerase is a special formulation of cloned Pfu DNA polymerase and patented ArchaeMaxx® Polymerase-Enhancing Factor that has been shown to significantly increase PCR product yields up to 19 kb without affecting replication fidelity (see Figure). The PfuTurbo DNA polymerase exhibits a lower error rate than other proofreading enzymes and a 6-fold lower rate than Taq DNA polymerase.



### PfuTurbo® DNA Polymerases

	Content	Amount	Catalog No.
PfuTurbo® DNA Polymerase	PfuTurbo® DNA Polymerase (2.5 U/μl), 10X Cloned Pfu Buffer	100 U	600250
		500 U	600252
		1000 U	600254
		5000 U	600256
PfuTurbo® DNA Polymerase Alternative Detergent	PfuTurbo® DNA Polymerase AD, 100 U PfuTurbo® DNA Polymerase AD, 500 U PfuTurbo® DNA Polymerase AD, 1000 U	100 U	600255
		500 U	600257
		1000 U	600259
PfuTurbo® Hotstart DNA Polymerase	PfuTurbo® Hotstart DNA Polymerase (2.5 U/μl), 10X Cloned Pfu Buffer	100 U	600320
		500 U	600322
		1000 U	600324
PfuTurbo® Hotstart PCR Master Mix	2X PfuTurbo® Hotstart PCR Master Mix including dNTPs	100 rxn	600600
		400 rxn	600602

## Pfu DNA Polymerase

- 6-fold lower error rate than Taq DNA polymerase
- One of the most thermostable DNA polymerases known
- 95% active after 1-hour incubation at 98°C



### High Fidelity Thermostable Enzyme

Our Pfu DNA Polymerase, derived from the hyperthermophilic archaea *Pyrococcus furiosus*, has been shown to exhibit superior thermostability and proofreading properties compared to other thermostable DNA Polymerases. Using Pfu DNA polymerase in your PCR reactions results in blunt-ended products, which are ideal for cloning into blunt-ended vectors, such as StrataClone™ PCR Cloning Vectors.

#### Pfu DNA Polymerases

	Content	Amount	Catalog No.
Native Pfu DNA Polymerase	Native Pfu DNA Polymerase (2.5 U/μl), 10X Native Pfu Buffer	100 U	600135
		500 U	600136
		1000 U	600140
Cloned Pfu DNA Polymerase	Cloned Pfu DNA Polymerase (2.5 U/μl), 10X Cloned Pfu Buffer	100 U	600153
		500 U	600154
		1000 U	600159
		5000 U	600160
Cloned Pfu DNA Polymerase AD	Cloned Pfu DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD	100 U	600353
		500 U	600355
Exo- Pfu DNA Polymerase	Exo- Pfu DNA Polymerase, 250 U	250 U	600163

## PfuTurbo® C<sub>x</sub> Hotstart DNA Polymerase

- Combines high fidelity with improved reliability
- Amplifies problematic systems with greater success
- Tolerates varying PCR conditions with little optimization required
- Accuracy equivalent to PfuTurbo® DNA Polymerase
- Hotstart formulation improves specificity
- Incorporates dUTP for use with UNG (uracil N-glycosylase) decontamination protocol

#### PfuTurbo® C<sub>x</sub> Hotstart DNA Polymerase

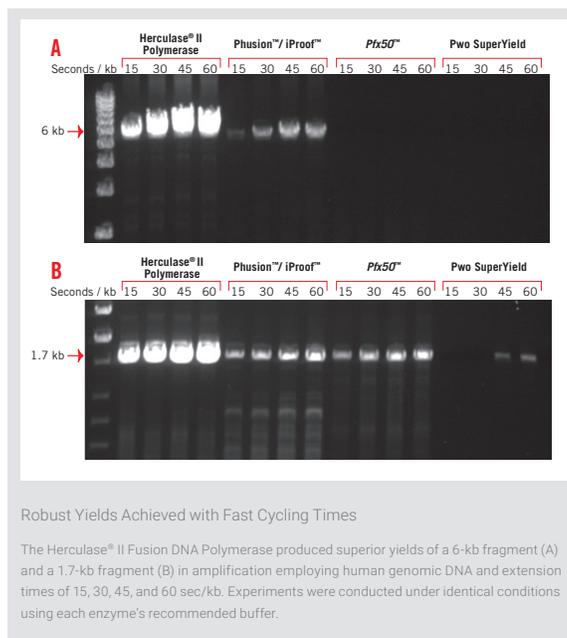
	Content	Amount	Catalog No.
PfuTurbo® C <sub>x</sub> Hotstart DNA Polymerase	PfuTurbo® C <sub>x</sub> Hotstart DNA Polymerase (2.5 U/μl), 10X PfuTurbo® C <sub>x</sub> Reaction Buffer, DMSO	100 U	600410
		500 U	600412
		1000 U	600414

## Herculase® II Fusion DNA Polymerase

- Superior yield for routine PCR applications and difficult/GC-rich targets
- Fusion enzyme technology improves processivity and reliability
- Equivalent fidelity to Pfu DNA polymerase
- High sensitivity for amplification of low amounts of DNA
- Ideal for high yield PCR cloning on all template complexities

Our Herculase® II Fusion DNA Polymerase provides superior yields in both routine and challenging PCR applications, with the additional benefit of allowing the use of fast cycling times. The Herculase II fusion DNA polymerase produces superior yields with extension times as short as 15 sec/kb, hence reducing the overall run times (see Figure). This great performance is a result of the highly processive Herculase II enzyme, as well as our proprietary ArchaeMaxx® Polymerase-Enhancing Factor and specially optimized Herculase II buffer.

Our Herculase II fusion DNA polymerase helps overcome PCR challenges with successful amplification of targets of all complexity. It easily amplifies targets that contain as high as 84% GC content. DMSO is provided separately as a PCR adjunct, and can be added when amplifying difficult targets. The Herculase II fusion DNA polymerase amplifies DNA fragments over a wide range of template lengths (up to 12 kb genomic DNA targets) and with great sensitivity.



Herculase® II Fusion DNA Polymerase			
	Content	Amount	Catalog No.
Herculase® II Fusion DNA Polymerase	Herculase® II Fusion DNA Polymerase, 5X Herculase® II Fusion DNA Polymerase Buffer, DMSO	40 rxn	600675
Herculase® II Fusion Enzyme with dNTPs	Herculase® II Fusion DNA Polymerase, 5X Herculase® II Fusion DNA Polymerase Buffer, DMSO, Deoxynucleotide Mix (dNTPs)	200 rxn 400 rxn	600677 600679

## Herculase® Enhanced DNA Polymerase

- Effectively amplifies long, complex, and/or GC-rich targets
- Pfu-based enzyme blend
- Higher fidelity than Taq-based polymerase blends
- Hotstart version available for enhanced specificity
- Convenient 2X hotstart master mix format available



### Herculase Enhanced DNA Polymerase

	Content	Amount	Catalog No.
Herculase® Enhanced DNA Polymerase	Herculase® DNA Polymerase (5 U/μl), 10X Herculase® Buffer, DMSO	100 U	600260
		500 U	600262
		1000 U	600264
		5000 U	600266
Herculase® Hotstart DNA Polymerase	Herculase® Hotstart DNA Polymerase (5 U/μl), 10X Herculase® Buffer, DMSO	100 U	600310
		500 U	600312
		1000 U	600314

## PicoMaxx® High-Fidelity PCR System & Master Mix

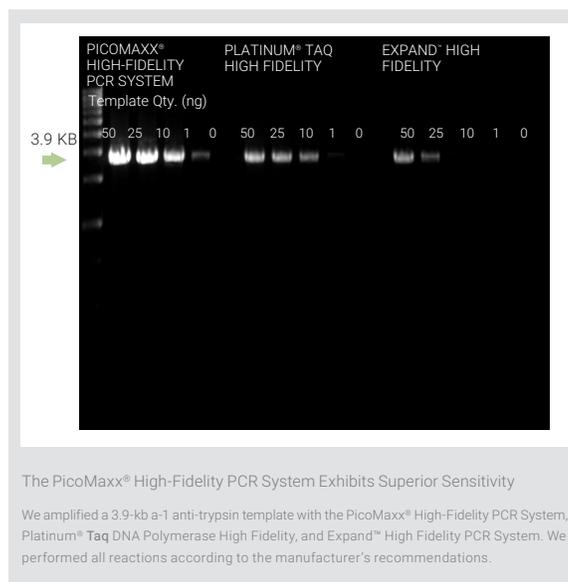
- High sensitivity provides great PCR reliability
- Consistent, robust amplification up to 10 kb
- Superior amplification efficiency and product yields
- High-specificity hotstart allows room temperature setup

### Superior PCR Sensitivity

The PicoMaxx® High-Fidelity PCR System is designed to provide maximum PCR sensitivity and efficiency. Formulated with a blend of Taq and Pfu DNA polymerases and our exclusive ArchaeMaxx® Polymerase-Enhancing Factor, the PicoMaxx high-fidelity PCR system overcomes PCR failures with great sensitivity (see Figure). It is one of the most reliable PCR enzyme formulations available.

### Master Mix Format for Added Convenience

The PicoMaxx high-fidelity PCR master mix is a convenient 2X formulation of the PicoMaxx PCR system, buffer, MgCl<sub>2</sub> and dNTPs all in one tube. The master mix format cuts reaction setup time and minimizes pipetting steps.



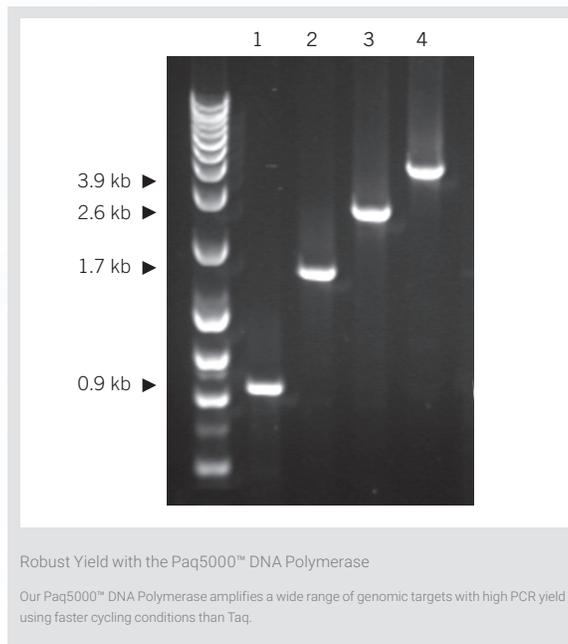
### PicoMaxx® High-Fidelity PCR System & Master Mix

	Content	Amount	Catalog No.
PicoMaxx® High-Fidelity PCR System	PicoMaxx® High-Fidelity PCR system (2.5 U/μl), 10X PicoMaxx™ Reaction Buffer	100 U	600420
		500 U	600422
		1000 U	600424
PicoMaxx® High-Fidelity PCR Master Mix	2X PicoMaxx® High-Fidelity PCR Master Mix including dNTPs	100 rxn	600650

## Paq5000™ DNA Polymerase

- Economic alternative to Taq
- High PCR yield
- Fast cycling conditions
- Includes our exclusive ArchaeMaxx® Polymerase-Enhancing Factor

Our Paq5000™ DNA Polymerase is a new alternative to Taq and is optimized to provide equivalent or better performance. In addition, the Paq5000 DNA polymerase is optimized for fast cycling conditions to save you time and increase throughput (see Figure). The enzyme is a recombinant, DNA-dependent DNA polymerase isolated from a *Pyrococcus* species. The Paq5000 DNA polymerase is ideal for endpoint PCR for up to 6 kb genomic targets. It is not recommended for high-fidelity cloning or 5' nuclease assays.



### Paq5000™ DNA Polymerase

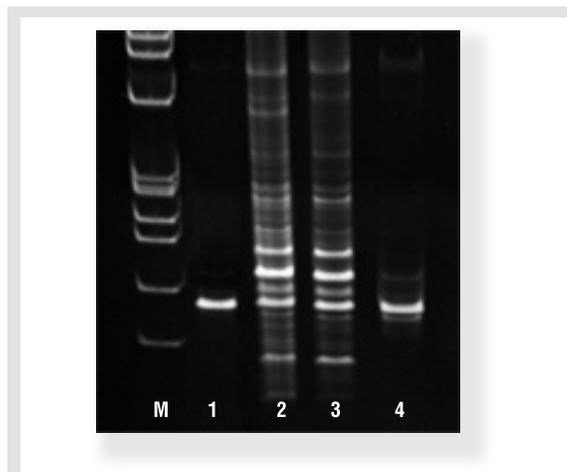
	Content	Amount	Catalog No.
Paq5000™ DNA Polymerase	Paq5000™ DNA Polymerase (5 U/μl), 10X Paq5000™ DNA Polymerase Buffer	500 U	600680
		1000 U	600682
		5000 U	600684
	Paq5000 Hotstart DNA Polymerase	500 U	600860
		1000 U	600862
		5000 U	600864
	Paq5000 2X MasterMix	100 rxn	600870
		400 rxn	600872

## SureStart® Taq DNA Polymerase

- Greater PCR specificity and reduced nonspecific background
- Reliable room temperature setup
- Thoroughly tested for quantitative PCR applications

### Hot-Start Taq DNA Polymerase

Our SureStart® Taq DNA polymerase is a chemically-modified hotstart version of our Taq2000™ DNA polymerase. The SureStart Taq polymerase incorporates hotstart into PCR protocols previously optimized with Taq DNA polymerase with little modification of cycling parameters or reaction conditions. In addition, our SureStart Taq DNA polymerase can be used in a variety of amplification systems to improve specificity, yield, and detection of low-copy-number targets (see Figure).



SureStart® Taq Polymerase Increases Specificity

A 105-bp fragment of the glucocerebrosidase gene was amplified from human genomic DNA. Lane 1: SureStart® Taq DNA polymerase, Lane 2: unmodified Taq DNA polymerase, Lane 3: an antibody-based hotstart Taq DNA polymerase, Lane 4: a competitor's modified Taq DNA polymerase.

### SureStart® Taq DNA Polymerases

	Content	Amount	Catalog No.
SureStart® Taq DNA Polymerase	SureStart® Taq DNA polymerase (5 U/μl), 10X SureStart® Taq Polymerase Buffer (1 ml)	100 U	600280
	SureStart® Taq DNA polymerase (5 U/μl), 10X SureStart® Taq Polymerase Buffer (2 x 1 ml)	500 U	600282
	SureStart® Taq DNA polymerase (5 U/μl), 10X SureStart® Taq Polymerase Buffer (4 x 1 ml)	1000 U	600284

## Taq2000™ DNA Polymerase

- Ultrapure cloned Taq DNA polymerase
- Minimizes smearing
- Most thermostable Taq DNA polymerase

### The Purest Taq DNA Polymerase Available

Our Taq2000™ DNA Polymerase is a highly purified, recombinant Taq DNA polymerase cloned from the thermophilic eubacteria, *Thermus aquaticus*. Using Taq2000 DNA polymerase in long PCR amplifications reduces smearing and virtually eliminates unwanted background artifacts. Our Taq2000 DNA polymerase provides the same consistent results as our native Taq DNA polymerase. It has superior thermostability compared to other commercial Taq DNA polymerase preparations.

#### Taq2000™ DNA Polymerases

	Content	Amount	Catalog No.
Taq2000™ DNA Polymerase (recombinant)	Taq2000™ DNA Polymerase (5 U/μl), 10X Taq Polymerase Buffer (100 U)	100 U	600195
	Taq2000™ DNA Polymerase (5 U/μl), 10X Taq Polymerase Buffer (500 U)	500 U	600196
	Taq2000™ DNA Polymerase (5 U/μl), 10X Taq Polymerase Buffer (1000 U)	1000 U	600197
	Taq2000™ DNA Polymerase (5 U/μl), 10X Taq Polymerase Buffer (5000 U)	5000 U	600198

## Specialty Kits

#### SureDirect Blood PCR Kit

	Content	Amount	Catalog No.
SureDirect Blood PCR Kit	SureDirect Blood PCR Kit, 100 rxn	100 rxn	600920

#### Mycoplasma Assay Kits

	Content	Amount	Catalog No.
MycoSensor QPCR Assay Kit	MycoSensor QPCR Assay Kit	50 rxn	302107
		100 rxn	302106
MycoSensor PCR Assay Kit	MycoSensor PCR Assay Kit	50 rxn	302109
		100 rxn	302108

## PCR amplification

# Deoxynucleotide Mix, PCR-Grade

- Produces high quality reaction products
- Withstands multiple freeze-thaw cycles without compromising efficiency

### Deoxynucleotide Mix, PCR-Grade

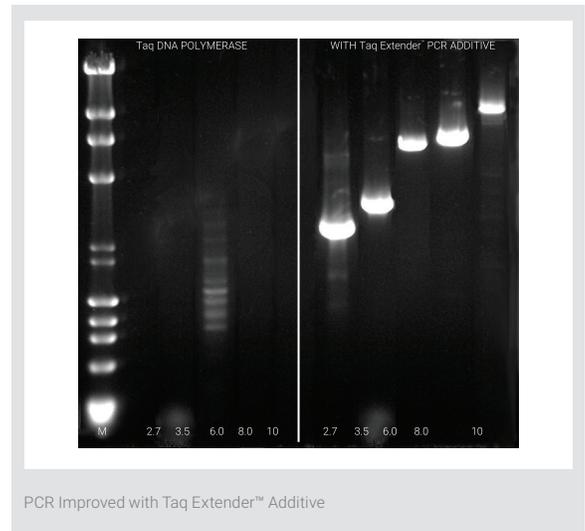
	Content	Amount	Catalog No.
Deoxynucleotide Mix, PCR-Grade	Deoxynucleotide Mix, PCR-grade, 100 mM dNTP mix (25 mM of each dNTP)	400 µl	200415

# Taq Extender™ PCR Additive

- Improves length, yield and reliability of PCR
- Enhances efficiency of template extension by Taq DNA polymerase

### Increased Yield and Reliability of Amplification Reactions

Our Taq Extender™ PCR Additive increases the efficiency of Taq DNA polymerase extension during each cycle of PCR by reducing mismatch pausing, resulting in a greater percentage of full-length extension products (see Figure). The Taq Extender PCR additive improves the PCR amplification of difficult templates and increases the reliability and yield of targets up to 10 kb in length. Simply add the easy-to-use Taq Extender PCR additive to your amplification reactions in an amount equal to that of Taq DNA polymerase, replace your standard buffer with an optimized 10X Taq Extender buffer, and use your standard PCR cycling conditions.



### Taq Extender™ PCR Additive

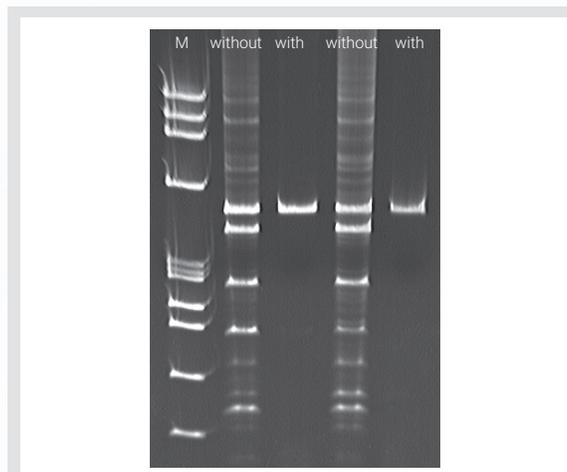
	Content	Amount	Catalog No.
Taq Extender™ PCR Additive	Taq Extender™ PCR Additive (5 U/ml), 10X Taq Extender Buffer (2 x 1 ml)	1000 U	600148

## Perfect Match® PCR Enhancer

- Increases yield and specificity of primary PCR amplification products
- Minimizes formation of poorly matched primer-template complexes
- Add to genomic PCR reactions to destabilize mismatched primer-template complexes

### Enhanced PCR Specificity

Our Perfect Match® PCR Enhancer substantially increases PCR product specificity. The specific benefits derived from the Perfect Match® PCR enhancer depend on the degree of primer-template homology. For example, primer-template complexes that contain substantial mismatched nucleotides near the 3' terminus of the primer are destabilized by the Perfect Match PCR enhancer and will not generate amplified product. Most perfect or near-perfect primer-template complexes, or primers with regions of nonhomology at their 5' terminus, produce the same or greater amounts of amplified product when using Perfect Match enhancer.



Perfect Match® PCR Enhancer Improves Specificity of PCR Reactions

Transgenic mouse genomic DNA template amplified using the standard PCR protocol in the absence or presence of 1 U of Perfect Match® PCR Enhancer.

#### Perfect Match® PCR Enhancer

	Amount	Catalog No.
Perfect Match® PCR Enhancer	100 U	600129
	200 U	600130

## SureCycler 8800 Thermal Cycler

### The easy choice for both speed and volume

- Highest speed and flexible reaction volumes
- Agilent's enzymes with Fusion technology perform with the speed of the instrument to produce faster and better results

### The easy choice for flexibility with 96 and 384 well blocks

- Quickly convert interchangeable blocks based on your lab's needs

### The easy choice for superior uniformity and gradient

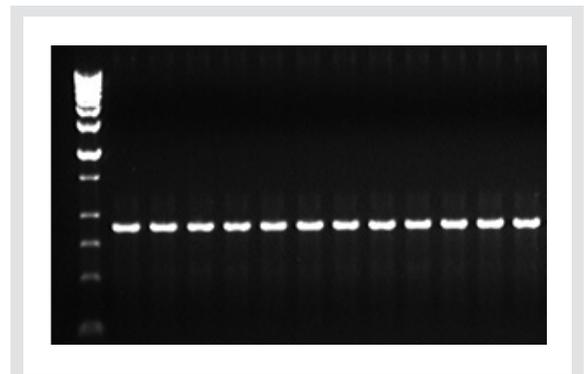
- Gradient functionality without sacrificing uniformity
- Excellent gradient functionality for accelerated protocol development and unique applications

### The easy choice for simple interface and established functionality

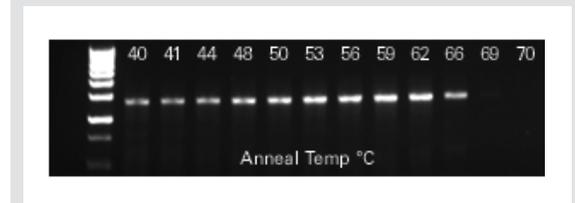
- 7" high resolution touch screen with intuitive easy-to-use software
- Intuitive Wizards create protocols designed for your lab's conditions



Market-leading cycling speed and volumes from 10 to 100  $\mu$ l



Market-leading uniformity gives superior results every time you run your protocol



Gradient enables single run optimization of your protocol



Easy interchangeable module

*The Agilent SureCycler 8800 is one easy decision to a complete portfolio of PCR solutions*

*The Agilent SureCycler 8800 gives you the best overall specification package*



Specifications	96-well block	384-well block
Maximum Block Ramp Rate	6° C/sec	4° C/sec
Block Temperature Range	4° C to 99° C	4° C to 99° C
Temperature Accuracy	±0.2° (@95° C)	±0.2° (@95° C)
Temperature Uniformity	±0.4° (@95° C)	±0.4° (@95° C)
Gradient	Yes	Yes
Gradient Temperature Range	30° C to 99° C	30° C to 99° C
Maximum Gradient	30° C	30° C
Volume Capacity	10-100 µl	5-25 µl
Memory Capacity	10,000 protocols	
Pre-loaded Protocols	Yes	
PCR Wizard	Yes	
Display Size	7 inches	
Display Resolution	800 x 480	
Display Type	Full Touch Screen	
Ports	2 x USB 2.0	
Dimensions	41 L x 28 W x 27 H (38 open) cm	
Weight	12.4 kg	
Standard Warranty	2 year	

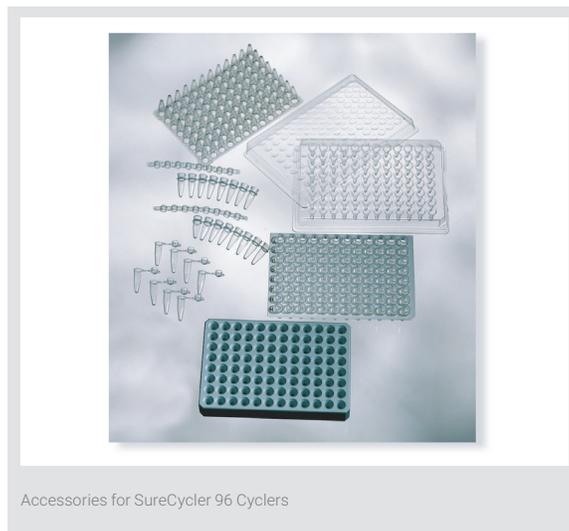
## Accessories for PCR

### Thin-Wall Tube Strips and Cap Strips

- Faster heating and cooling for more efficient heat transfer
- Cap strips available separately for use with the Thin-Wall Tube Strips and 96-well plates

### Working Racks

- Keeps samples cool on ice before and after PCR
- For easy handling of tubes and plates



#### SureCycler 8800 System - Gradient System Thermocycler

	Description	Amount	Catalog No.
Polypropylene 96-Well Plates	+ For SureCycler	25 plates	410088
96-Well Plate Sealing Film	+ For use with polycarbonate 96-well plates + Not for use with Hot Top	100 precut pieces	410152
Thin-Wall Tubes	+ Nonsterile 200- $\mu$ l tubes	1000 tubes	410091
Thin-Wall Tube Strips	+ Nonsterile 200- $\mu$ l tubes + 200- $\mu$ l tubes	80 12-tube strips 120 8-tube strips	410082 410092

#### SureCycler 8800 System Accessories

	Description	Amount	Catalog No.
Tube Cap Strips	+ For use with catalog #410092 and #410088 (not for use with QPCR)	8 Strips	410096
40-Well Benchtop Working Rack	+ For use with 600- $\mu$ l tubes or V-bottom plates	1 rack	410098
96-Well Benchtop Working Rack	+ For use with 200- $\mu$ l tubes or V-bottom plates	1 rack	410094

# PCR Purification

Our StrataPrep® DNA Purification Kits are offered in single-tube, high-throughput plates or gel matrix formats. DNA purified using our StrataPrep kits is pure and application-ready in minutes, saving you valuable research time.

## PCR Purification and Separation

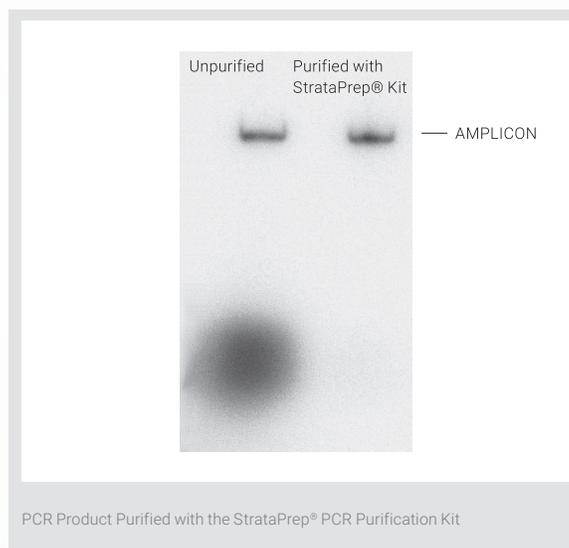
Application	Product	Advantages	Page No.
Clean up of PCR products	StrataPrep® PCR Purification Kit	+ Rapid purification of PCR products in single spin cup format	19
High-throughput purification	StrataPrep® 96 PCR Purification Kit	+ Rapid, high-throughput purification of PCR products in 96-well plate format	19

## StrataPrep® PCR Purification Kits

- High-yield purification of PCR products 100 bp to 23 kb
- DNA is application-ready in minutes
- Removes primers, unincorporated nucleotides, buffer components, enzymes, and nonspecific amplification products
- Convenient microspin-column or 96-well format utilizing silica-based fiber matrix technology

### Fast and Easy Method Produces Pure PCR DNA

The StrataPrep® PCR Purification Kit purifies PCR products quickly and easily, using a special silica-based fiber matrix technology in a microspin-column format to capture DNA in the presence of a chaotropic salt. Each microspin cup has the capacity to generate up to 10 µg of highly purified PCR product, ready for applications such as cloning, labeling/probe generation, sequencing and secondary PCR. The StrataPrep 96 Purification Kit uses the same matrix technology in a high-throughput 96-well plate format. For more information please see page 159.



PCR Product Purified with the StrataPrep® PCR Purification Kit

## StrataPrep® PCR Purification Kits

	Description	Amount	Catalog No.
StrataPrep® PCR Purification Kit	DNA-binding solution, PCR wash buffer, microspin cups and receptacle tubes	50 preps	400771
		250 preps	400773
StrataPrep® 96 PCR Purification Kit	96-well binding plates, 96-well collection plates, DNA-binding solution, PCR wash buffer, plate sealer, storage mats, elution buffer	2 plates	400775
		10 plates	400776
		50 plates	400774

# PCR Cloning

## High Efficiency DNA Topoisomerase I PCR Cloning

Our innovative cloning systems have facilitated the cloning and characterization of genes for over 20 years. With our StrataClone™ PCR Cloning Kits, cloning PCR products is now easier, faster, and more reliable than conventional PCR cloning methods. PCR cloning typically involves multiple laboratory procedures such as gel purification, restriction enzyme digestion, blunt-end polishing, dephosphorylation, and overnight ligation reactions all catalyzed by separate proteins. In addition to being time-consuming, these procedures can be difficult to perform, sometimes requiring several attempts to get your clone of interest.

Topoisomerase-based cloning saves you time and money with simple primer design, no PCR clean-up, and an easy three-step process. Simply add your PCR product to the vector mix, incubate 5 minutes at room temperature, and transform ligated DNA into competent cells. With our >95% insert-positive guarantee, you are sure to get your clone the first time every time.

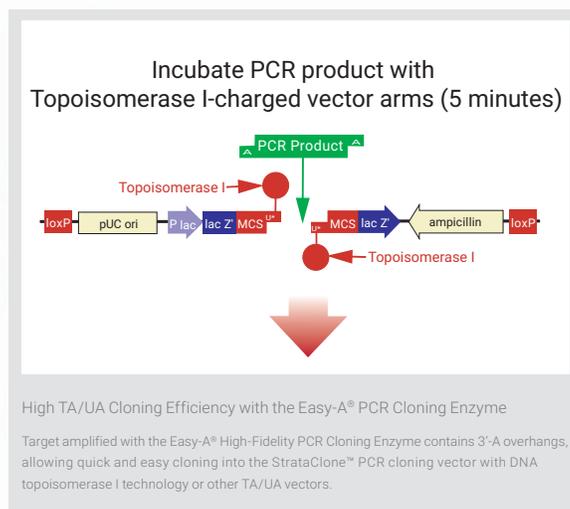
PCR Cloning			
Application	Product	Advantages	Page No.
DNA Topoisomerase I PCR Cloning	StrataClone™ PCR Cloning Kits	+ Clone both long and short amplicons with every kit + Kits for both UA and blunt-end cloning + High efficiency yields >95% clones with insert	21
Generate blunt-ended DNA fragments in 30 minutes	PCR Polishing Kit	+ Optimize Taq-generated PCR products for cloning	21
Blunt end cloning of PCR products	PCR-Script® Cloning Kit	+ Fast and efficient blunt-ended cloning of PCR products regardless of the PCR enzyme used to generate the inserts	21

# Easy-A® High-Fidelity PCR Cloning Enzyme

- Proofreading DNA polymerase adds 3'- A overhangs to PCR amplicons
- Combines accuracy of Pfu with TA/UA cloning efficiency of Taq
- Eliminates post-PCR A-addition steps and contamination risk
- 6-fold higher accuracy than Taq DNA polymerase

## One-Step High-Fidelity TA/UA PCR Cloning

The Easy-A® High-Fidelity PCR Cloning Enzyme is the only proofreading DNA polymerase formulation to deliver PCR products for high-throughput TA or UA cloning. PCR products with the Easy-A PCR cloning enzyme can be cloned directly to our StrataClone™ PCR Cloning Kit and other T-A/U-A vectors (see Figure). The Easy-A PCR cloning enzyme possesses terminal transferase activity which preferentially adds a single 3'- A overhang to the end of PCR products. Unlike Taq, our Easy-A high-fidelity PCR cloning enzyme has 3' to 5' proofreading capability that provides the accuracy level of Pfu DNA polymerase (see tables below).



Clones with Errors		
PCR Product Size	Easy-A® PCR Cloning Enzyme	Taq DNA Polymerase
300 bp	0.65%	4.0%
500 bp	1.3%	8.0%
900 bp	2.6%	14.4%
1500 bp	4.0%	24.0%
4000 bp	10.0%	64.0%

### Superior Accuracy of Easy-A® PCR Cloning Enzyme

The incorporation accuracy of Easy-A® cloning enzyme is approximately 6-fold higher than Taq DNA polymerase, and 2- to 3-fold higher than other proofreading archaeal DNA polymerases such as KOD, Platinum® Pfx, Vent® and Deep Vent®. The calculated effect of enzyme error rate on the percentage of mutated PCR products after amplification of target sequences of various sizes for 20 effective cycles (10<sup>6</sup>-fold amplification). Some PCR products will exhibit more than one error. Calculated as: Error Rate = Mutation Frequency per base pair per duplication

PCR Cloning Results					
PCR Insert	PCR Insert Size	Total Colonies	Blue	White	%White
1	664 bp	262	3	259	99%
2	1.8 kb	178	1	177	99%
3	3.5 kb	774	4	770	99%
4	6.0 kb (gel purified)	635	3	632	99%
5	9.2 kb (gel purified)	466	7	459	98.5%

### StrataClone™ PCR Cloning Results in 95% Efficiency

The StrataClone™ PCR Cloning Kit was used to clone PCR fragments from a common fluorescent protein (665 bp), I-globin (1.8 kb), β-globin (3.5 kb), and two fragments from human α-1-antitrypsin (6 kb and 9.2 kb). We used undiluted PCR reaction mix (2 μl) to clone PCR fragments 1-3. Larger PCR products 4 and 5 were gel purified prior to cloning. PCR fragment 1 was amplified from plasmid DNA, fragment 2 from first strand cDNA, and fragments 3, 4, and 5 were amplified from human genomic DNA. PCR was performed using our Taq2000™ DNA Polymerase

(664 bp and 1.8 kb), Easy-A® High-Fidelity PCR Cloning enzyme (3.5 kb) or TaqPlus® Long PCR System (6 and 9.2 kb). Colonies were picked at random and screened by restriction digests to verify results.

### Easy-A® High-Fidelity PCR Cloning Enzyme and Master Mix

	Content	Amount	Catalog No.
Easy-A® High-Fidelity PCR Cloning Enzyme	Easy-A® High-Fidelity PCR Cloning Enzyme (5 U/μl), 10X	100 U	600400
	Easy-A® Reaction Buffer	500 U	600402
		1000 U	600404
Easy-A® High-Fidelity PCR Master Mix	2X Easy-A® High-Fidelity PCR Master Mix including dNTPs	100 rxn 400 rxn	600640 600642

## Other Reagents and Kits

Contents	Amount	Catalog No.
StrataPrep DNA Gel Extraction	50 rxn	400766
Dpn I Restriction Enzyme	200 U	500402
T4 DNA Ligase	300 U	600011
RNase Free DNase	1000 U	600031
RNase Free DNase	5000 U	600032
T3 RNA Polymerase	5000 U	600111
Total RNA Isolation Mini Kit	50	5185-6000
Plant RNA Isolation Mini Kit	50	5188-2780
StrataPrep® Plasmid Miniprep Kit	50 rxn	400761
StrataPrep® Plasmid Miniprep Kit	250 rxn	400763
StrataPrep DNA Gel Extraction	250 rxn	400768
DNA Extraction Kit	1 Kit	200600
Absolutely RNA FFPE Kit (w/o Deparaffinization Reagents)	50 Preps	400811
Absolutely RNA miRNA Kit	50 Preps	400814
Absolutely RNA FFPE Kit	50 Preps	400809
Absolutely RNA Miniprep Kit	50 Preps	400800
Absolutely RNA 96 Microprep Kit	2 Plates	400793
Absolutely RNA Microprep Kit	50 Preps	400805
Absolutely RNA Nanoprep Kit	50 Preps	400753

Learn more:

[www.agilent.com/genomics/lifescience](http://www.agilent.com/genomics/lifescience)

**For Research Use Only. Not for use in diagnostic procedures.**

This information is subject to change without notice.

PR7000-1837  
 © Agilent Technologies, Inc. 2018  
 Published in the USA, February 1, 2018  
 5991-9020EN

