

Have your PCR enzymes **evolved**?



Wild-type enzymes are transformed into engineered enzymes through a process of high-throughput molecular evolution.

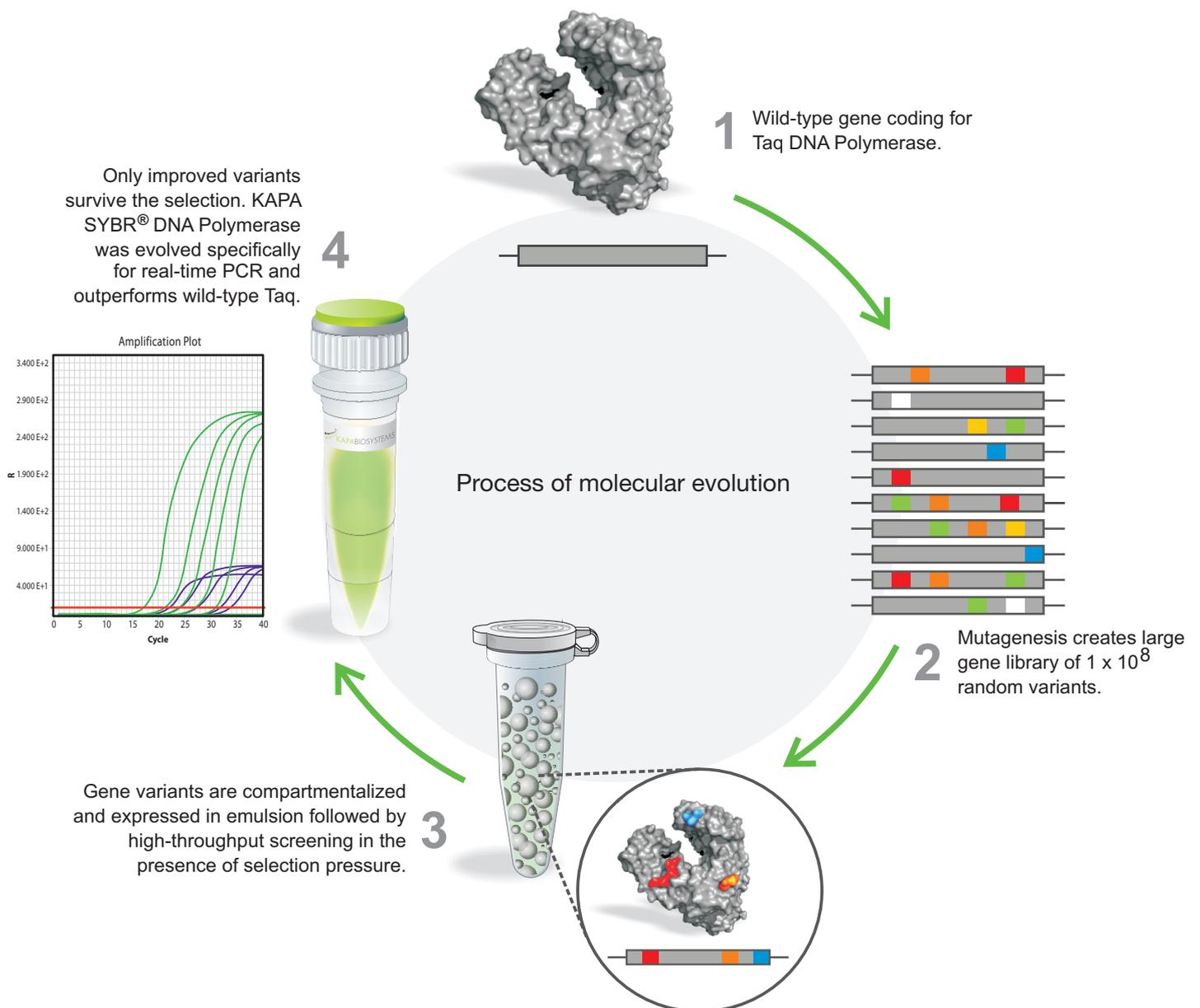
Welcome to next-generation PCR.

Wild-type enzymes are transformed into engineered enzymes through a process of high-throughput molecular evolution.

Despite advances in PCR applications, the majority of commercially available PCR reagents contain the same wild-type *Taq* DNA polymerase. Kapa Biosystems employs a novel strategy for engineering proteins that involves simulating evolution in the laboratory. Large libraries of protein variants are screened using specific functional selection assays and only the enzymes with improved function and performance survive for the next round of selection.

Our portfolio of second-generation (2G) PCR reagents contain optimized DNA polymerases engineered specifically for your PCR application. These enzymes are fundamentally different than wild-type polymerases at the protein level and contain unique amino acid modifications that confer dramatic improvements to the function and performance of the enzyme.

Our technology



>> Next-Generation PCR



KAPA2G Robust HotStart

Improve PCR success rates with this highly versatile second-generation polymerase.

KAPA2G Robust DNA Polymerase offers higher processivity and specific activity, which translates to robust performance across a wide range of GC- and AT-rich templates, difficult samples, and improved tolerance to many common PCR inhibitors such as ethanol, salt, and SDS. The enzyme of choice for crude samples, including colony PCR.



KAPA SYBR® FAST qPCR Kits

The first DNA polymerase engineered for real-time PCR.

KAPA SYBR® FAST DNA Polymerase has been evolved to perform optimally in stringent qPCR reaction conditions, exhibiting significant improvements in signal-to-noise ratio, cycle threshold (Ct), linearity, speed, and sensitivity. Kits are available for all qPCR instruments, including the Roche LightCycler® 480.



KAPA PROBE FAST qPCR Kits

Precise, reproducible, and versatile kit for all probe-based qPCR applications.

Kits contain a ready-to-use master mix for highly sensitive and accurate real-time PCR using sequence-specific probe chemistries including TaqMan®, FRET probes, and molecular beacons. Optimized for versatility and speed – KAPA PROBE FAST qPCR Kits provide fast and reproducible results for genotyping, gene expression analysis, and multiplexing.



KAPA HiFi HotStart

World's highest fidelity polymerase for PCR - 100X increase in fidelity over Taq.

KAPA HiFi HotStart is a novel, single-enzyme system that exhibits industry-leading performance when compared with other high fidelity polymerases and polymerase blends. The intrinsic high processivity of KAPA HiFi HotStart results in significant improvements in yield, sensitivity, speed, target length, and the ability to amplify difficult templates.



KAPA2G Fast HotStart

The ultimate hot start enzyme for extreme speed and performance.

Evolved specifically for speed and high performance, KAPA2G Fast HotStart offers Fast PCR based on the intrinsic ability of the KAPA2G Fast DNA polymerase to synthesize DNA at a much faster rate than wild-type polymerases. 1 second per kilobase extension rate allows for increased productivity and faster time to results without sacrificing performance.



KAPA Long Range HotStart

Engineered for long templates and extreme sensitivity.

The KAPA Long Range system is engineered for the amplification of long and complex targets up to 20 kb. The system is optimized specifically for high yields and extreme sensitivity. KAPA Long Range also exhibits a 4X improvement in fidelity as compared to standard Taq DNA polymerase.



KAPA Blood PCR Mix

Eliminate DNA extraction with the first polymerase engineered for PCR direct from blood.

The enzyme is supplied in an easy-to-use ReadyMix format containing all PCR components except primers and template. KAPA Blood PCR Mix is ideal for end-point PCR using one or more primer sets, end-point PCR followed by direct restriction enzyme digestion specific for SNPs, and paternity testing using the Promega PowerPlex® 16 System.



KAPA Express Extract

Rapid and efficient extraction of DNA from a broad range of source material.

A novel thermostable protease and buffer system that allows for the extraction of PCR-ready DNA from various tissue types in as little as 15 minutes. KAPA Express Extract has been designed for optimal tissue lysis and DNA preservation. DNA extractions are conveniently performed in a single-tube, without the need for hazardous chemicals and multiple washing steps, thereby greatly reducing the risk of sample loss and contamination.

>> Next-Generation PCR

Product	KAPA SYBR® FAST	KAPA PROBE FAST	KAPA2G Robust	KAPA2G Fast	KAPA HiFi	KAPA Long Range	KAPA Blood
Hot start available	✓	✓	✓	✓	✓	✓	N/A
Performance							
Sensitivity	●●●●	●●●●	●●●●	●●●	●●●	●●●●	●●
Fidelity (vs wt Taq)	1X	1X	1X	1X	100X	3X - 4X	1X
Specificity	●●●●	●●●●	●●●	●●●	●●●	●●●●	●●●
Speed (extension time)	20 - 30 sec anneal/extend	20 - 30 sec anneal/extend	15 - 30 sec/kb	1 - 15 sec/kb	15 - 30 sec/kb	60 sec/kb	60 sec/kb
Robustness	●●●●	●●●	●●●●	●●●	●●●●	●●●	●●●
Yield	●●●●	●●●●	●●●●	●●●	●●●●	●●●●	●●●
Application							
Real-Time PCR	✓	✓					
Routine PCR			✓	✓			
High Fidelity PCR					✓	✓	
Fast PCR/qPCR	✓	✓	✓	✓	✓		
Cloning					✓	✓	
Colony PCR			✓		✓		
Crude sample PCR			✓				✓
GC-Rich PCR			✓		✓		
Gene Expression	✓	✓					
Genotyping	✓	✓	✓	✓			✓
Long Range PCR					✓	✓	
Multiplex PCR		✓		✓			
Next-Generation Sequencing	✓		✓	✓	✓	✓	
Whole Blood PCR							✓
Single Protocol PCR			✓		✓		
Site-directed Mutagenesis					✓		
SNP Detection		✓					
Amplicon size from different templates							
Human genomic DNA	0.1 kb - 1.5 kb	0.1 kb - 0.5 kb	<3.5 kb	<3.5 kb	<15 kb	<20 kb	<3.5 kb
Plasmid or lambda DNA	0.1 kb - 1.5 kb	0.1 kb - 0.5 kb	<5 kb	<5 kb	<20 kb	<20 kb	N/A
cDNA	0.1 kb - 1.5 kb	0.1 kb - 0.5 kb	<3.5 kb	<3.5 kb	<15 kb	<10 kb	N/A
Additional features							
3'-A product end	N/A	N/A	✓	✓		✓	✓
Blunt product end					✓		
ReadyMix available	✓	✓	✓	✓	✓		✓

For more information please contact sales@kapabiosystems.com or your local representative.

