Hot start redefined

AptaTaq DNA Polymerase Family

CUSTOMBIOTECH

Reversible enzyme activation, without the wait

AptaTaq DNA Polymerase Family

Redefine your assays for shorter time-to-result and higher specficity – choose one of our AptaTaq Polymerases. The AptaTaq Polymerase family features an aptamer-oligonucleotide mixture with temperature-dependent tertiary structure (Figure 1).

Designed for IVD Manufacturers

- Glycerol-free and highly concentrated formulation available for dry formats
- Rely on extensive testing, ISO 13485 quality and lot-to-lot consistency to ensure your process security
- Prevent PCR carryover contamination by using Uracil-DNA Glycosylase and dUTP

Stability at room temperature

- Work with highly stable enzyme enabling storing at room temperature (+15 to +25°C) for up to one month
- Eliminate freeze-thaw steps
- Easily set up your PCR reaction at room temperature

Reduce time-to-result and ensure specificity

- Use a stable aptamer for reversible enzyme inactivation to maximize specificity, sensitivity, and yield
- Save up to 15 minutes per run by omitting the initial activation step required by chemically modified hot start polymerases

Formats suitable to your needs

- Choose from master mixes or stand-alone enzymes
- Use the Δ exo enzyme variant for SNP analysis and allele-specific PCR
- Work with low DNA format in microbiology assays

The aptamer principle

Similar to antibody-based methods, the enzyme is activated by heating. However, in contrast to antibodies, the aptamer-oligonucleotides are synthetically manufactured and less temperature-sensitive, reducing the risk of contamination and allowing storage at room temperature. Enzyme inactivation is achieved by a tight bond of the aptamer-oligonucleotide to the polymerase at lower temperatures. The aptamer acts as a molecular switch, changing the temperature-dependent tertiary structure. Dropping the temperature below 55°C shuts off the polymerase activity; temperatures above 60°C fully activate the enzyme.

Inactive Taq DNA Polymerase inhibited by aptamer

Active Taq DNA Polymerase + denatured aptamer

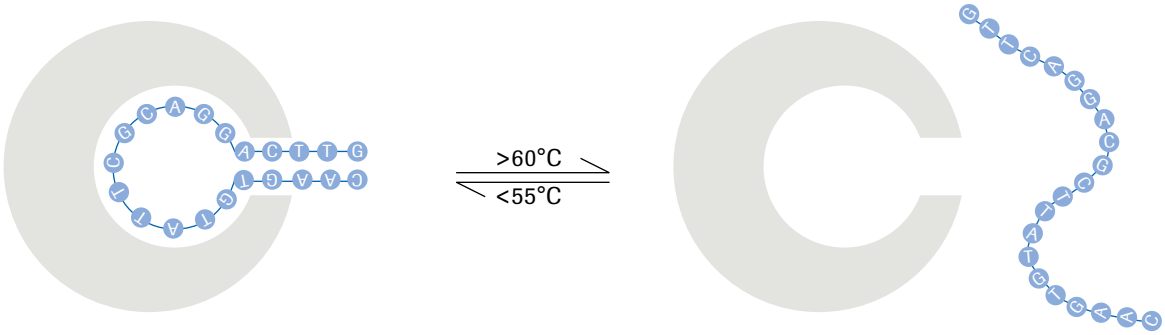


Figure 1: The enzyme aptamer-oligonucleotide mixture is a reversible, temperature-dependent hot start system.

Gain flexibility in assay format design with lyo-ready AptaTaq DNA Polymerases

Glycerol-free formulations at high concentrations

AptaTaq DNA Polymerases are formulated in a glycerol-free solution at high concentrations, which guarantees their stability throughout the lyophilization process and subsequent storage (Figure 2). These robust polymerases can be dried down directly on PCR plates and exhibit the same high performance before and after lyophilization (Figure 3), offering greater flexibility for assay design and format.

Activity of fresh vs. dried enzyme stored at 37°C

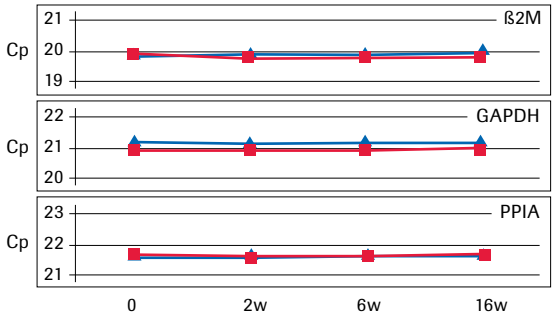


Figure 2: Comparison of PCR performance of AptaTaq DNA Polymerase from a freshly prepared master mix and previously dried-down format stored at 37°C for 2, 6 and 16 weeks. AptaTaq DNA Polymerase plus PCR primers and probes were dried down onto a 96-well plate. After rehydrating and adding sample material, Cp values were measured using real-time PCR.

Reliable performance with liquid and dried master mix preparations

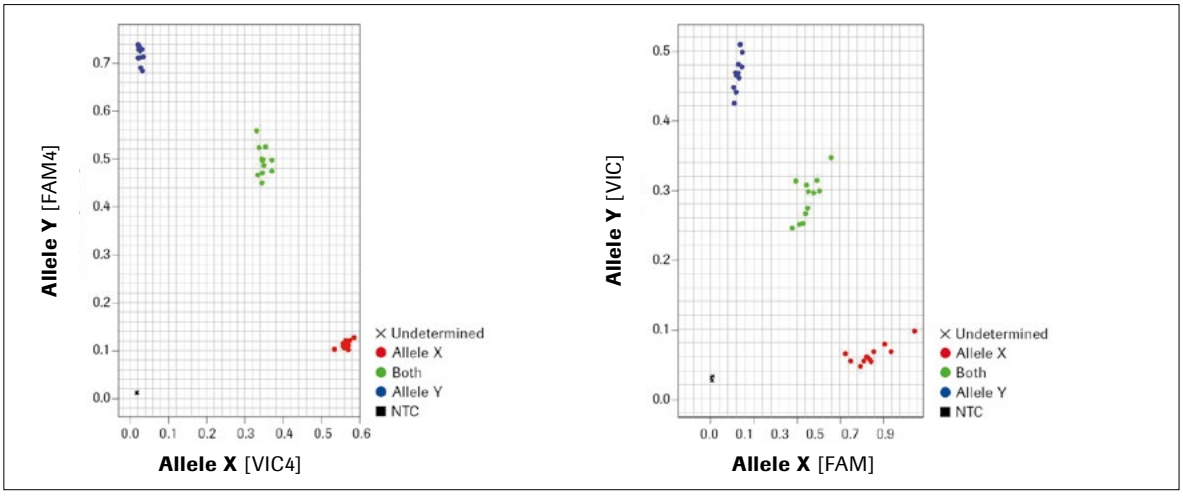


Figure 3: PCR using the AptaTaq Genotyping Master generated the same results with either a freshly prepared master mix in liquid format (left) or a pre-plated master mix in dried-down format (right). AptaTaq Genotyping Master plus PCR primers and probes were dried down without additives onto a 96-well plate. After rehydrating and adding sample material, real-time PCR was performed. For genotyping, endpoint fluorescence was plotted for VIC and FAM channels.

Product	Catalog number
AptaTaq DNA Polymerase, 50 U/µl	05 187 605 103
AptaTaq Δ exo DNA Polymerase, 50 U/µl	05 364 086 103
AptaTaq DNA Polymerase LDx, 50 U/µl	05 447 895 103
AptaTaq Genotyping Master	05 955 807 103
AptaTaq Genotyping Master (Rox)	05 955 823 103

Specificity and stability for qPCR and multiplex PCR
AptaTaq DNA Polymerase

Choose AptaTaq DNA Polymerase for all single- or multiplex PCR and qPCR applications that require high specificity, sensitivity, yield, and fast time-to-result. The AptaTaq DNA Polymerase-based assay shows a broad dynamic range. The specific and stable enzyme allows target detection down to very low copy numbers (Figure 4), and shows no loss of activity after storage for 14 months at +2 to +8°C (Figure 5).

Amplification of Factor V wild-type target

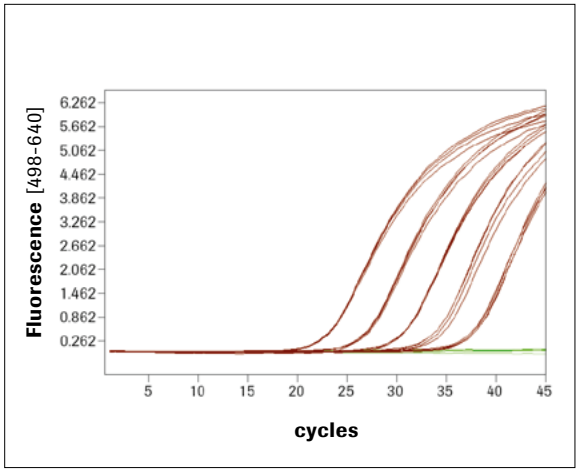


Figure 4: Sensitivity and specificity of AptaTaq DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument. Various amounts of plasmid DNA (5000 fg to 0.5 fg) were used for the amplification of a Factor V wild-type fragment using HybProbe probe format.

Real-time stability at +2 to +8°C

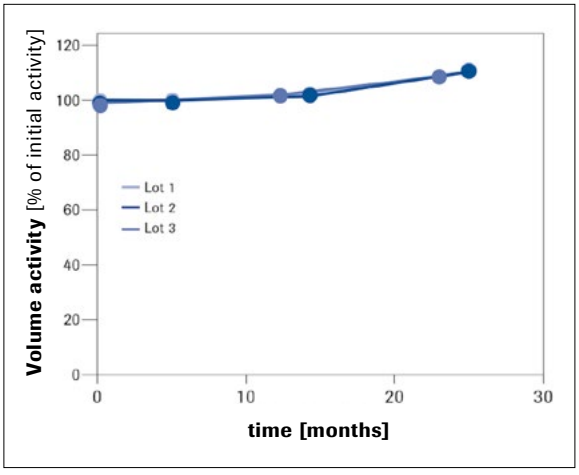


Figure 5: Real-time stability of AptaTaq DNA Polymerase, glycerol-free, 50 U/µl. Volume activity was determined by a radioactive test after storage at +2 to +8°C for different time periods. Activity is given in % of activity at time point zero.

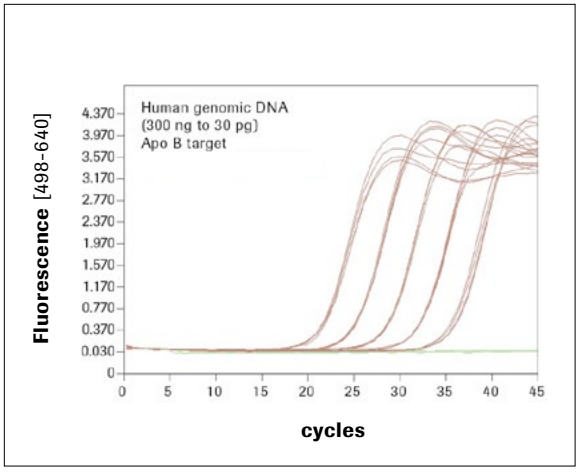
Product	Catalog number
AptaTaq DNA Polymerase 5 U/µl	05 457 882 103
AptaTaq DNA Polymerase glycerol-free, 50 U/µl	05 187 605 103

Optimized for SNP analysis and genotyping
AptaTaq Δ exo DNA Polymerase

This optimized mixture of high-quality N-terminal-deleted Taq DNA Polymerase and an aptamer oligonucleotide provides discrimination against misextension and displays a broad dynamic range (Figure 6). Choose AptaTaq Δ exo DNA Polymerase for SNP analysis and genotyping,allele-specific PCR, multiplexing, and arbitrarily primed PCR.

- **Optimize your SNP analysis**
  Discriminate between paired and unpaired primer ends using an enzyme optimized for allele-specific PCR
- **Obtain reliable results fast**
  Benefit from the AptaTaq DNA Polymerase system's speed and robustness in applications requiring a Taq DNA polymerase lacking 5' to 3' exonuclease activity

Amplification of Apo B



Amplification of Parvo B19

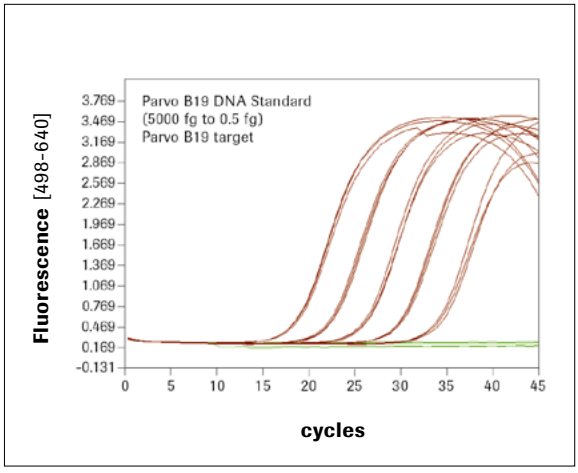


Figure 6: Sensitivity of AptaTaq Δ exo DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument.
Thermal cycling conditions: Denaturation: 30 seconds at 95°C. Amplification: 5 seconds at 95°C, 15 seconds at 60°C, 10 seconds at 72°C, 45 cycles. Cooling: 60 seconds at 40°C.

Product	Catalog number
AptaTaq Δ exo DNA Polymerase 5 U/µl	05 458 030 103
AptaTaq Δ exo DNA Polymerase 50 U/µl	05 364 086 103

Remark: The enzyme has no 5' – 3' exonuclease activity and is thus not suited for hydrolysis probe-based assays.

Optimized for high through-put and dried formulations
AptaTaq Genotyping Master

AptaTaq Genotyping Master is especially suited for high throughput applications and is optimized for robotics and low reaction volumes. The PCR enzyme AptaTaq DNA Polymerase performs with unmatched stability and fast time-to-result (Figures 7 and 8).

- **Maximize flexibility**
  The 5x concentrated master mix permits variable reaction volumes, including low volumes of crude sample material
- **Obtain results in 30 minutes**
  Omit enzyme activation steps required by other hot start enzymes
- **Benefit from high throughput**
  Use a highly stable (24 hours at room temperature) mix whose optimized viscosity enables precise pipetting and advanced automation
- **Use multiwell plates with pre-plated master mix**
  Just add primers, probes, and your sample (Figure 3, page 3)

Precise unambiguous genotyping for different targets

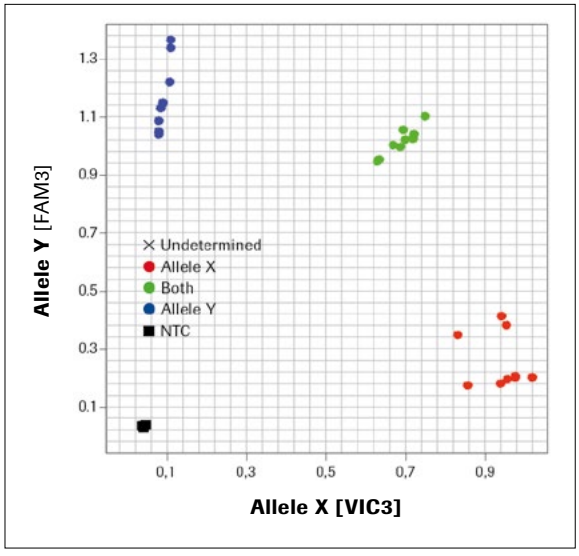


Figure 7: Clear allele separation by endpoint genotyping with hydrolysis probes using low reaction volumes on a Real-Time PCR Instrument. Wild type and mutant TGFß fragments were amplified using a 2-step protocol. Endpoint fluorescence was plotted in the VIC and FAM channels; reaction volume: 1 µl.

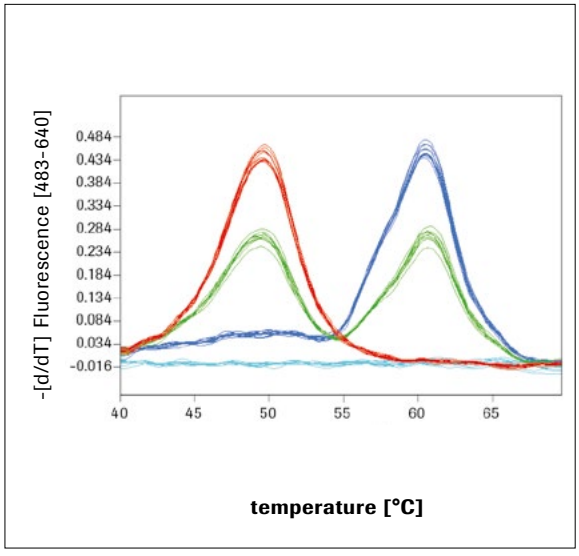


Figure 8: SNP detection with HybProbe probes using a Real-Time PCR Instrument. Different SNPs of human Factor II were genotyped by melting curve analysis after amplification using a 3-step real-time PCR protocol.

Product	Catalog number
AptaTaq Genotyping Master, 10ml	05 955 807 103
AptaTaq Genotyping Master, custom fill	05 890 152 103
AptaTaq Genotyping Master (ROX), 10 ml	05 955 823 103
AptaTaq Genotyping Master (ROX), custom fill	05 890 144 103

Tackle microbial detection with the right reagents
AptaTaq DNA Polymerase LDx

AptaTaq DNA Polymerase LDx is designed to deliver outstanding sensitivity for challenging detection assays that require top performance. Nucleic acid contamination from a range of sources can negatively impact PCR performance, reducing sensitivity, specificity and potentially producing false positive results. With state-of-the-art manufacturing facilities that operate under a stringent ISO13485-certified Quality Control System, Roche CustomBiotech produces an ultra-clean DNA polymerase. Ultra-sensitive quality control measures minimize the risk of bacterial, fungal or human DNA contamination.

Multiple measures reducing risk of potential contamination

- Selected raw materials guarantee reduced DNA content
- Equipment, buffers and solutions used are meticulously decontaminated
- Trained staff and dedicated clean rooms isolate production
- Traces of DNA contamination are removed by chromatography
- The final product is analyzed with LightCycler® assays to establish the absence of fungal DNA, gram-positive and gram-negative bacterial DNA, and human DNA
- Any presence of DNA is ensured to be below 1 genome equivalent per 20 Units DNA polymerase (Figure 9)

Quality control release assay

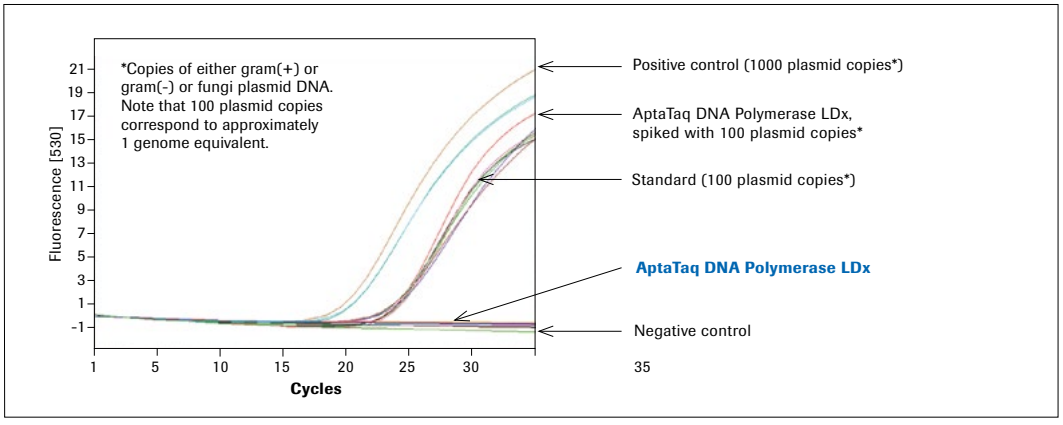


Figure 9: LightCycler® UniTool ResoLight quality control release assay for AptaTaq DNA Polymerase LDx on a Real-Time PCR Instrument. Test of thirty units of AptaTaq DNA Polymerase LDx, glycerol-free, 50 U/µl shows no contaminating gram(+) or gram(-) bacterial DNA or fungal DNA. The Quality Control release value is defined as <1 genome equivalent/20 units DNA polymerase.

Product	Catalog number
AptaTaq DNA Polymerase LDx, 5 U/µl	05 884 314 103
AptaTaq DNA Polymerase LDx, 50 U/µl	05 447 895 103

Ordering information for related products

Product	Pack size	Catalog number
NucleoMixes PCR Grade*		
dATP, dCTP, dGTP, dTTP (25 mmol/l each)	20 ml 100 ml	04 920 171 103 03 991 016 103
dATP, dCTP, dGTP, dTTP (10 mmol/l each)	100 ml	03 186 083 103
dATP, dCTP, dGTP, dUTP (25 mmol/l each)	20 ml	04 980 905 103
dATP, dCTP, dGTP, dUTP (10 mmol/l each)	100 ml	03 186 075 103
dNTPs PCR Grade*		
dATP (100 mmol/l)	20 ml 100 ml	04 631 056 103 11 889 516 103
dCTP (100 mmol/l)	20 ml 100 ml	04 631 072 103 11 889 508 103
dGTP (100 mmol/l)	20 ml 100 ml	04 631 129 103 11 889 524 103
dTTP (100 mmol/l)	20 ml 100 ml	04 631 137 103 11 889 559 103
dUTP (100 mmol/l)	20 ml 100 ml	04 631 145 103 11 889 532 103

Regulatory disclaimer

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56.3 and 3.23 REACH Regulation

* For further processing only.

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