AmpliTaq Gold® DNA Polymerase with GeneAmp® 10X PCR Gold Buffer

The world’s most referenced brand of DNA polymerase.

- **Automated hot-start capability** increases sensitivity, specificity, and yield
- **GeneAmp® 10X PCR Gold Buffer** simplifies optimization, providing definitive results
- **Time-release thermal activation** improves low-copy target amplification

**Introduction**

AmpliTaq Gold® DNA Polymerase is a thermostable enzyme designed to make advanced PCR techniques easy. Unlike other hot-start PCR systems, AmpliTaq Gold® DNA Polymerase activates slowly, which gives PCR its “Hot Start, Strong Finish®”. When combined with the GeneAmp® 10X PCR Gold Buffer, this hot-start system provides a flexible solution that results in robust PCR and highly specific amplification. As shown in Figure 1, AmpliTaq Gold® outperforms a competitor’s hot-start polymerase both in terms of yield and specificity.

**Hot-Start PCR**

The hot-start PCR technique is a simple modification of the original PCR process that initiates the amplification at an elevated temperature. A chemically modified form of AmpliTaq® DNA Polymerase, AmpliTaq Gold® DNA Polymerase facilitates the hot-start process through its thermal activation property. The AmpliTaq Gold® enzyme is inactive due to the chemical modification and it remains inactive during the PCR setup steps and throughout the first ramp of thermal cycling, preventing the extension of misannealed primers. When the reaction attains the optimal annealing temperature, a heat-activated cleavage of the chemical moiety releases the active AmpliTaq Gold® enzyme.

**Flexible Activation with GeneAmp® 10X PCR Gold Buffer**

AmpliTaq Gold® DNA Polymerase can be activated completely in a pre-PCR heat step, or it can be allowed to activate slowly in a time-release fashion during the denaturation steps of thermal cycling. GeneAmp®10X PCR Gold Buffer is formulated to provide flexible, efficient activation of AmpliTaq Gold® DNA Polymerase, resulting in greater specificity and robustness.

**Figure 1.** AmpliTaq Gold® DNA Polymerase eliminates amplification of non-specific products, resulting in a substantial increase in specificity and yield when compared to Competitor hot-start polymerase. A series of six different targets were amplified from human genomic DNA using the GeneAmp® PCR System 9700. Reactions in Figure 1B were performed according to manufacturer’s recommendations.
This combination of enzyme and buffer improves the initial PCR success rate, compensates for variations in thermal cycler temperature, allows the shortening or elimination of pre-PCR activation protocols, and lets you control the amount of enzyme activated during thermal cycling.

**Enhanced Specificity with Time-Release PCR**
AmpliTaq Gold® DNA Polymerase becomes active in a time-release manner during thermal cycling. The limited up-front heat activation step lets enzyme activity increase during thermal cycling to better match the dynamic template concentration. The resulting increase in specificity makes time-release thermal activation ideal for low-copy target amplification in the presence of background DNA.

**Increased Yield with “Hot Start, Strong Finish” PCR**
AmpliTaq Gold® enzyme increases the yield of specific product because nonspecific products do not form, and therefore no reactants are wasted. Polymerase activity is directed exclusively at the desired target throughout the entire thermal cycling process. In multiplex PCR, this not only increases yield, but also increases the success rate for target amplification (Figure 2).

**PCR Performance Guarantee**
Each lot of AmpliTaq Gold® DNA Polymerase with GeneAmp® 10X PCR Gold Buffer has been shown to yield a specifically expressed band on an ethidium bromide-stained agarose gel when starting with 10 copies of a viral template and used in accordance with the conditions described in the product insert.

**Unparalleled PCR Technical Support**
Applied Biosystems ongoing research and development programs focus exclusively on refining the PCR process and developing new applications and complementary PCR products. We offer technical seminars, PCR user-group meetings, and Internet sites to keep you up-to-date on PCR protocols and new applications. In addition, our experienced staff of PCR specialists is always available to assist you. For a list of national and international technical support phone numbers, visit our Web site www.appliedbiosystems.com/pcr.

**ORDERING INFORMATION**

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<th>AmpliTaq Gold® DNA Polymerase</th>
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Note: Bulk packaging is available. Please contact your sales representative for more information.

Figure 2. Multiplex PCR. Human targets from 10 ng genomic DNA, acrylamine N-acetyltransferase (700 bp), cytochrome P450 2E1 (332 bp), apolipoprotein E (192 bp)
Lane 1, 2: AmpliTaq Gold® DNA Polymerase with GeneAmp® 10X PCR Gold Buffer, 35 cycles
Lane 3: DNA standard 50–2,000 bp ladder
Lane 4, 5: AmpliTaq® DNA Polymerase (no hot-start), 35 cycles